Metals & mining decarbonisation and sector disclosure

Success in reducing carbon emissions will be a crucial element of corporate reporting in the metals and mining sector. In this article, we look at the universe of carbon emissions reporting, the current state of disclosure in the sector and corporates' carbon emission targets.

Content

- Decarbonisation and sector disclosures
- Carbon emissions: the more energy-intensive technology, the more significant the carbon footprint
- The universe of carbon governing rules, standards, disclosure & tracing initiatives and agencies
- Side-effects of such a sophisticated universe
- Current level of carbon emissions disclosure is good for sector champions, but still far from ideal across the sector and in comparison with other sectors

Decarbonisation and sector disclosures

The metals and mining sector is in the very early stages of a 30-year transition to carbon neutral production. The road to net zero carbon emissions, or carbon neutrality, will have a crucial impact on corporates in the sector through at least two channels: (a) through the growth in demand for various metals needed to build...
a green economy, and (b) through the decarbonisation of operating and business processes.

While the metals and mining sector is one of the biggest producers of carbon dioxide, emitting around 4.5Gt of CO2 equivalent per year, many of the world’s largest miners have set net-zero carbon targets, announcing projects to ‘green’ the production of aluminium, copper, steel, etc. Large-scale net-zero carbon projects remain elusive but the first steps to decarbonise have at least been taken. In June, for example, the Swedish consortium SSAB, LKAB & Vattenfall, produced the first hydrogen-reduced sponge iron (i.e. steel) on a small scale. Meanwhile, a large number of public corporates in the sector have begun to report their carbon footprint by disclosing Scope 1, Scope 2 and in some cases, even Scope 3 emissions, although these disclosures are mostly voluntary and require improvement in the quality, frequency and credibility.

In the highly energy-intensive aluminium industry, the most advanced companies are trying to maximise the use of renewable energy but are still far from producing ‘green’ aluminium across the supply chain. Projects to produce ‘green’ nickel and copper have been announced over the last couple of years but are still far from completion. Decarbonisation will require a huge amount of investment into new technologies, such as green hydrogen production, carbon capture, storage and transportation. Technological transformation will trigger significant investment, which will be reflected in new green debt and equity supply.

In this article, we discuss how the metals and mining sector is shifting towards carbon neutrality. We look at the emissions produced, the sector’s current stance, the level of reporting from corporates and the targets they have set. We also examine the sector’s share in the supply of ‘green’ and sustainable debt in the total green finance supply, the potential amount of investment required, and what it all means for investors.

**Carbon emissions: the more energy-intensive technology, the more significant the carbon footprint**

The metals and mining sector currently produces a significant portion of global CO2 emissions. If we take 1.83t of average carbon intensity per tonne of steel produced (according to the World Steel Association) and multiply this number by the total annual steel production of 1,878mt, steel sector emissions alone lead to 3.436Mt of CO2 equivalent, which is around 10% of the combined global 33.9Gt of CO2 emissions in 2020. The International Aluminium Institute estimates the combined carbon footprint from the aluminium sector at around 1,050Mt of CO2 in 2019, or 3.0% of total global emissions. Altogether, we estimate the total carbon footprint from steel, aluminium, copper, nickel, cobalt output at around 4.5Gt of CO2 equivalent in 2020, or 13.5% of global CO2 emissions.

Overall carbon emissions depend on the total output, particular product, technology and on energy efficiency in this technology. The share of scrap used to cast primary metal may have an impact on global CO2 emissions. Carbon intensity varies significantly not only among metal types, but also within each metal group depending on the amount of energy consumed and the type of fuel used in the technology process (energy consumed - hydro, gas, coal or renewables). The global average carbon intensity in aluminium is around 15t of CO2/t of metals produced but declines to around 4.0t if hydropower becomes the primary energy source. In
the steel sector, where 70% of the energy consumption is derived from coal, carbon intensity from an old Basic Oxygen Furnace (BOF) is around 2.2t of CO2/t while the global average is 1.83t. Steel produced from the direct reduction - electric arc furnace (DR-EAF) method leaves 1.4t, while steel produced from scrap leaves only 0.3t of CO2.

Carbon and energy intensity of tonne of metal produced

According to the International Energy Agency, energy intensity needs to decline by 1.2% annually in steel production and by 1.5% annually to 2030 in aluminium production to be on track with Sustainable Development Goals and to reach carbon neutrality. Carbon emissions disclosures and the setting and reaching of targets will be crucial for large public players in the sector. Investors and banks will look more closely at companies' decarbonisation track record and their achievements in increasing energy efficiency, and lowering overall carbon emissions and carbon intensity.

The universe of carbon governing rules, standards, disclosure & tracing initiatives and agencies

ESG and climate reporting is a very complicated universe. The reporting and accounting of carbon emissions, as well as the verification and audit process, imply significant investment, which assumes a certain minimum scale of business and publicity. So far, climate disclosure is not mandatory in most jurisdictions, but we believe it could be in five to 10 years' time. A large number of global initiatives on the tracing of corporate carbon emissions have emerged over the last decade. Global carbon governing rules, principles, standards and disclosure & tracing initiatives are already sophisticated and expanding further, requiring additional skills, expertise and knowledge. Most market- and voluntary-driven initiatives are aimed at forcing corporates to set up reporting systems, become transparent in terms of carbon emissions and set up targets on carbon emissions reductions. As a result, numerous disclosure standards, data sets, ESG and climate ratings and rankings, carbon disclosure ratings, green finance processes and principles have emerged. Below is a simplified map with some of the key players in this Sustainable Development universe.
Scope of carbon governing rules, principles, standards, disclosure & tracing initiatives

Side-effects of such a sophisticated universe

**For investors:** Excessive information from various sources (corporate reporting, ESG rating agencies data, various carbon tracing initiatives) might distract from key performance indicators such as carbon targets, the reduction of overall emissions and carbon intensity. Even if the data is protected by a paywall, this does not guarantee its credibility or offer protection from poor data quality, data checking and verification. The emergence of different reporting standards, and the large amount of reporting sources may lead to data discrepancies and in some cases, the available databases may have limited use. In the end, this could erode the value of very large databases.

**For corporates:** Numerous standards, initiatives, ratings and rankings may be confusing. The costs and barriers to entry in the green disclosure era may be high. Only large corporates may be able to absorb additional reporting & disclosure costs, the costs to participate in various initiatives and, in some cases, the fees for verification and green audits, etc. Larger companies are also more likely to have a market-driven motivation to invest in sustainable operating infrastructure, and sustainable/ green projects as well as conduct costly green R&D.

**Current level of carbon emissions disclosure is good for sector champions, but still far from ideal across the sector and in comparison with other sectors**

Despite the fact that a lot of corporates have started to publish sustainability reports and disclose various ESG data, the absence of unified reporting and the large and varied set of disclosed data mean that it is difficult to get good and credible cross-region and cross sector analysis. Tracing carbon emissions and other
environmental data is therefore quite problematic.

To help with this, various non-profit initiatives have emerged to help society, corporates and regulators with carbon tracing, carbon reporting, carbon emissions reductions, the setting and verifying of carbon targets, and empowering corporates to follow best market practices in carbon emissions disclosure. We have found very useful reports and data by CDP (Carbon Disclosure Project), TPI (Transition Pathway Initiative), STBI (Science Based Targets initiative) and Climate Action 100+. Sector Associations, such as the World Steel Association, also provide useful aggregated numbers on carbon and energy intensity, and encourage members to become more transparent through sustainability rankings. Data gathered by these initiatives helps to gauge the current state of carbon emissions disclosure in the metals and mining sector.

Transition Pathway Initiative data (accessed in August 2021) provides information on the carbon emissions disclosure and performance of 103 companies from the metals and mining sector out of 425 participants: 21 from aluminium, 13 from diversified mining, 34 from steel sub-sectors and 35 from coal mining. According to TPI, the metals and mining sector slightly underperformed other sectors in terms of disclosure:

- **Scope 1 and Scope 2 emissions disclosure**: 66% (69 out of 103 in total) of metals and mining corporates report vs 82% (264 out of 322 in total) of other sectors
- **Scope 3 emissions disclosure**: 47% (48) reports in metals and mining vs 63% (203) of other sectors
- **Verification of Scope 1 & Scope 2 emissions**: 56% (58) corporates in sector vs 63% (204) of corporates in other sectors
- **Long-term carbon emissions reduction targets**: 36% (37 corporates) vs 65% (209) in other sectors
- **Incorporation of climate change performance into senior executives remuneration**: 28% (29 corporates) companies vs 43% (139) in other sectors

Science Based Targets Initiative (STBI) sets science-based standards and pathways for each sector based on the Energy Technology Perspectives report published by the IEA in 2014. STBI provides a step-by-step guide on how companies can reduce greenhouse gas emissions. The STBI progress report in 2020 highlights that target setting is working: the typical company with science-based targets has reduced its direct (scope 1 and 2) emissions by 6.4% per year, exceeding the 4.2% rate needed to limit warming to 1.5°C, according to pathways derived from climate scenarios. According to STBI, 338 companies with approved science-based targets found they have reduced their combined emissions by 25% since 2015 (a reduction of 302mt of CO2 equivalent) targets.
Sector champions are becoming much more transparent. More companies have started to report carbon emissions and have set long-term (2050+) and medium-term (2030) carbon emissions reduction targets. And many of the big names are reporting a massive amount of ESG-related data. As an example, Rio Tinto, which reports according to Global Reporting Initiative (GRI) Standards under the Sustainable Development Goals (SDGs), has been included in ESG indices and has received numerous ESG ratings (DJSI - 68; CDP - B, ISS OEKOM - 'C+', MSCI - 'A', Sustainalytics - 'High'). The company is also in the process of receiving ratings from FTSE4 Good, EcoVadis, RMI and Vigeo Eris. Below are the charts with carbon intensity for aluminium and steel producers, based on TPI data.
Each year, the number of corporates that set carbon emissions targets is growing. Below is the list of corporates from the aluminium, coal mining, diversified mining and steel subsectors which have already set long-term carbon emissions reduction targets.

**Companies with long-term carbon emissions reduction targets**

<table>
<thead>
<tr>
<th>Aluminium</th>
<th>Coal mining</th>
<th>Diversified Mining</th>
<th>Steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcoa</td>
<td>African Rainbow Minerals</td>
<td>Anglo American</td>
<td>Acerinox</td>
</tr>
<tr>
<td>Alumina</td>
<td>Anglo American (Coal Mining)</td>
<td>BHP</td>
<td>Arcelor Mittal</td>
</tr>
<tr>
<td>Arconic</td>
<td>BHP (Coal Mining)</td>
<td>Glencore</td>
<td>Bluescope Steel</td>
</tr>
<tr>
<td>Chinalco</td>
<td>Enex India</td>
<td>Newmont Corporation</td>
<td>China Baowu Steel</td>
</tr>
<tr>
<td>EN+ Group (UC Rusal)</td>
<td>Eneos (Coal Mining)</td>
<td>Rio Tinto</td>
<td>EVRAZ</td>
</tr>
<tr>
<td>Glencore (Aluminium)</td>
<td>Exxaro Resources</td>
<td>Teck Resources</td>
<td>HBI</td>
</tr>
<tr>
<td>Nippon Light Metal</td>
<td>Glencore (Coal Mining)</td>
<td>Vale</td>
<td>Hyundai Steel</td>
</tr>
<tr>
<td>Norsk Hydro</td>
<td>Mitsubishi</td>
<td>Vedanta</td>
<td>JSW Steel</td>
</tr>
<tr>
<td>Rio Tinto (Aluminium)</td>
<td>Sumitomo</td>
<td></td>
<td>JFE Holdings</td>
</tr>
<tr>
<td>Showa Denko</td>
<td>Sumitomo Chemical</td>
<td></td>
<td>Nippon Steel</td>
</tr>
<tr>
<td>Sumitomo Chemical</td>
<td>rcei (Coal Mining)</td>
<td></td>
<td>Posco</td>
</tr>
<tr>
<td>Vedanta (Aluminium)</td>
<td>Vale (Coal Mining)</td>
<td></td>
<td>SSAB</td>
</tr>
<tr>
<td></td>
<td>Source: TPI, BNEF</td>
<td></td>
<td>Ootokumpu</td>
</tr>
</tbody>
</table>

**Carbon intensity targets of selected aluminium companies**

Source: TPI, ING Research
Carbon intensity targets of selected steel companies

Source: TPI, ING Research

Egor Fedorov
Senior Credit Analyst
egor.fedorov@ing.com
Disclaimer

This publication has been prepared by the Economic and Financial Analysis Division of ING Bank N.V. ("ING") solely for information purposes without regard to any particular user's investment objectives, financial situation, or means. ING forms part of ING Group (being for this purpose ING Group N.V. and its subsidiary and affiliated companies). The information in the publication is not an investment recommendation and it is not investment, legal or tax advice or an offer or solicitation to purchase or sell any financial instrument. Reasonable care has been taken to ensure that this publication is not untrue or misleading when published, but ING does not represent that it is accurate or complete. ING does not accept any liability for any direct, indirect or consequential loss arising from any use of this publication.

Unless otherwise stated, any views, forecasts, or estimates are solely those of the author(s), as of the date of the publication and are subject to change without notice. The distribution of this publication may be restricted by law or regulation in different jurisdictions and persons into whose possession this publication comes should inform themselves about, and observe, such restrictions. Copyright and database rights protection exists in this report and it may not be reproduced, distributed or published by any person for any purpose without the prior express consent of ING. All rights are reserved. ING Bank N.V. is authorised by the Dutch Central Bank and supervised by the European Central Bank (ECB), the Dutch Central Bank (DNB) and the Dutch Authority for the Financial Markets (AFM). ING Bank N.V. is incorporated in the Netherlands (Trade Register no. 33031431 Amsterdam). In the United Kingdom this information is approved and/or communicated by ING Bank N.V., London Branch. ING Bank N.V., London Branch is authorised by the Prudential Regulation Authority and is subject to regulation by the Financial Conduct Authority and limited regulation by the Prudential Regulation Authority. ING Bank N.V., London branch is registered in England (Registration number BR000341) at 8-10 Moorgate, London EC2 6DA. For US Investors: Any person wishing to discuss this report or effect transactions in any security discussed herein should contact ING Financial Markets LLC, which is a member of the NYSE, FINRA and SIPC and part of ING, and which has accepted responsibility for the distribution of this report in the United States under applicable requirements. Additional information is available on request. For more information about ING Group, please visit http://www.ing.com.