InBrief

Measurement, reporting and verification and the mining and metals industry
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This paper forms part of a series of InBrief publications that begin to scope out the links between the mining and metals industry and the three focus areas in ICMM’s climate change program.

Mining is a global industry with operations spread across developing and developed countries. In many developing countries it is often a significant contributor to GDP and poverty alleviation. Minerals and metals are also required for low carbon development – e.g. copper, aluminium, platinum and coking coal are inputs for building renewable energy infrastructure.

Climate change presents both challenges and opportunities for the mining and metals industry. The three focus areas in ICMM’s climate change program offer industry-specific insights on issues important to climate policy formation.

Background

All countries will be required to include provisions in their national climate change plans to measure, report and verify their progress in tackling GHG emissions. It is in the interest of all stakeholders for the information to be fully transparent, comparable, robust and consistent.

Distinctions currently exist in the UN Framework Convention on Climate Change (UNFCCC) between the obligations of developed and developing countries. The challenge for measurement, reporting and verification (MRV), in this respect, is to agree on those standards that will make all MRV regimes effective and efficient when implemented in national circumstances. Under the Kyoto Protocol, Annex I parties will have to measure, report and verify their emissions reductions using guidelines from the UNFCCC which are included in national registries. Non-Annex I Parties [developing country participants] have different requirements for their national communications that are more flexible and less harmonized than those for developed countries.

Following the Kyoto Protocol, the Cancun agreements established that, in addition to the submission of national communications, all countries will in future submit biennial reports. These give updates on national communications and include information on current emissions, mitigation targets and/or actions and provision and receipt of support. For developing countries, national communications and biennial reports are to be produced in a manner consistent with national capabilities and level of support provided. There is additional flexibility in terms of frequency and content given to least developed countries and small island developing states.

Robust MRV of the new biennial reports will be critical. Developed countries will likely retain their current national systems for GHG emissions reporting, but it is hoped their approaches will be made consistent and comparable because of a common international assessment and review to which their data will be subjected. Developing countries’ data and reporting are not subject to such common international assessment. Achieving consistency and comparability across developing country MRV regimes will likely be dependent on voluntary acceptance of standardized approaches.

Successful elements of existing regimes for measuring, reporting and verifying GHG data can serve as building blocks for MRV approaches in every country without them having to invent new or different systems.

Taking into account the different approaches to MRV in developed and developing countries, elements of a standard approach to MRV could include:

• applying the same criteria and definitions for measuring emissions from the same activities of companies that operate in the same sub-sectors across jurisdictions
• accepting verified reports from industry that follow the same criteria for the activities of all companies operating in the same sub-sectors across jurisdictions
• establishing procedures for government-industry-civil society interaction to support communication on MRV standards and implementation. This includes procedures for entities subject to MRV to suggest practical improvements and/or adapt submissions of their verified data in accordance with proven existing standards.

The UNFCCC could, in its deliberations and decisions:

• call on a neutral independent entity to report on successful aspects of existing MRV regimes that could, in principle, apply to any MRV regime as standard practice
• recognize that future Guidelines for National GHG Inventories, National Communication and Biennial Reports, should promote transparency and comparability by building on existing proven approaches.

“Achieving consistency and comparability across developing country MRV regimes looks to be dependent on voluntary acceptance of standardized approaches.”
Our Climate Change program

In May 2011, ICMM formally launched its climate change program. Building on ICMM’s 2009 Policy on climate change: Implementing a global solution to managing a low emissions economy, ICMM’s Council of CEOs established a climate change program with three elements: principles governments should follow should they decide to regulate greenhouse gas [GHG] emissions, a set of commitments that members will meet, and three focus areas of work.

The program is aimed at: (1) ensuring ICMM companies continue to contribute to sustainable development while participating positively in the resolution of the climate change challenge; and (2) securing the continued competitiveness of the mining and metals industry in a future low carbon economy.

This initiative seeks a measured transition to a low-carbon future. The principles-based approach at its core is intended as a contribution to the evolution of climate change-related public policy when policies are being designed and implemented. This approach recognizes the reality of nation-specific solutions which need to respect the circumstances around the world and a country’s different priorities (for example, poverty reduction, development, adaptation).

The core of ICMM’s climate change program implementation is provided by:

a) an integrated set of seven principles for climate change policy design that build on those contained in the 2009 policy:
   1. provide clear policies for a predictable, measured transition to a long term price on greenhouse gas (GHG) emissions
   2. apply climate change related revenues to manage a transition to a low carbon future
   3. facilitate trade competitiveness across sectors
   4. seek broad-based application
   5. be predictable and gradual
   6. be simple and effective
   7. support low-emission base-load generation technology development.

b) the work program will initially focus on the following three topics:
   1. national climate policies and competitiveness
   2. land use and adaption to the impacts of climate change
   3. measurement, reporting and verification of net greenhouse gas activities.

c) a set of ICMM member company commitments. As a minimum, ICMM members accept their responsibility to:
   1. develop greenhouse gas emission reduction strategies and implement economic emissions reductions opportunities
   2. ensure efficient use of natural resources
   3. support research and development of low greenhouse gas emission technologies that are appropriate to the industry
   4. measure progress and report results.

Measurement, reporting and verification (MRV) and the mining and metals industry

A consistent and stable global regime remains an important long term goal and ICMM’s Climate Change program is intended to contribute to that end. Clarifying MRV standards internationally builds confidence and ensures that actions are being implemented and countries are making progress towards their committed targets. A consistent approach to MRV that draws on existing regimes would provide transparency to emissions reporting and accounting.

ICMM, in common with many other industry sectors, believes that if governments decide to adopt greenhouse gas emission regulations, they should do so in a way that allows for a clear and measured transition towards a long-term price on greenhouse gas [GHG] emissions. A key component of carbon pricing policies is effective and transparent reporting and a compliance mechanism which ensures the system has integrity. Additionally, there is a need for the MRV system to facilitate tracking the impact of climate policies on competitiveness; any national policies with weak MRV systems will work to obscure and make comparisons of effectiveness and stringency of country commitments difficult. Implementing transparent and comparable MRV systems is therefore critical to developing credible national climate change policy and effective pricing regimes.

The world is moving towards a system of multiple climate policy and MRV regimes. All major economies, even states and provinces within some countries, are proposing individual targets and actions and developing independent policy frameworks and regulations. These will likely be subject to nationally-determined, “bottom-up”, MRV regimes. The result could well be a complex regulatory environment which leads to higher compliance costs. Furthermore, information may not be directly comparable across countries. This is especially true for international companies such as those found in the mining and metals industry.

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In 2010, ICMM reviewed its member GHG emissions from 2009 for both Scope 1 (direct emissions from operations) and Scope 2 (indirect emissions from electricity use). This information was used to develop GHG emissions intensity metrics for each of the major mineral and metal commodities produced by ICMM member companies. This was combined with data on total global production volumes of each commodity to perform a simple extrapolation at global level which provided a very high-level estimate of total global mining and metals industry GHG emissions, by commodity. This approach can provide a broad indication of the industry’s contribution to global GHG emissions. Currently, it is close to 1Gt carbon dioxide equivalent (CO$_2$e) - approximately 2% of global total emissions (the scope of the study comprised of mining, smelting and refining of 17 major commodity groups).

Approximately half of mining and metals industry emissions are Scope 1; from use of fuel in mining and processing operations and from fugitive methane (CH$_4$) emissions at coal mines. The other half is Scope 2; from use of electricity, primarily in refining and smelting operations.

There are limitations with this approach, due to sector-specific characteristics but extrapolating trends still provides a good indication of mining and metals’ contribution to global emissions.

**Box 1: WBCSD/WRI GHG Protocol**

The GHG Protocol: Corporate Standard was developed via a multi-stakeholder process. Initially published in 2001, it was updated in 2004. Over the last 10 years it has been taken up and used by organisations of all types as a framework for monitoring, reporting and verification of GHG emissions at organisational and operational level.

It sets out key principles of relevance, completeness, consistency, transparency and accuracy for corporate GHG inventories which are consistent with IPCC guidelines. It also draws distinction between various scopes of emissions: Scope 1 (direct); Scope 2 (indirect from electricity use); Scope 3 (other indirect).

The protocol has very wide application within the mining and metals industry. For example ICMM is on the technical working group for “products and scope 3 (non-electricity use indirect emissions) accounting and reporting standards”. At a country level, Anglo American is a founding member of the Brazil GHG Protocol Program and at an industrial level, the International Aluminium Industry has developed a sector addendum to the protocol.

**Mandatory MRV regimes in the mining and metals industry**

Mining and metals companies operating in the USA, Canada, the European Union and other European Economic Area countries that have entered the EU Emissions Trading Scheme (EU ETS), Japan and Australia comply with mandatory GHG monitoring and reporting requirements.

The overall approach of these MRV systems is broadly similar, often following aspects of IPCC guidelines. There are however, many differences which add complexity and cost for companies operating in multiple jurisdictions. This also has implications for the consistency and comparability of national emissions inventories. There are methodological differences in regional MRV requirements in the way mandatory schemes establish the: reporting entity, applicability thresholds, coverage of industry sectors, coverage of GHGs, specific accounting methods and guidelines, materiality thresholds and verification requirements. These are partly determined by the type of policy instrument in each region to mitigate emissions as well as the political acceptability of different styles and components of MRV.

“As additional jurisdictions around the world develop plans for domestic GHG reporting systems, there is a strong prospect that existing patchwork of differing reporting requirements will expand.”
Voluntary MRV regimes in the mining and metals industry

Many companies in the mining and metals industry, including ICMM members, are also engaged in voluntary GHG reporting initiatives. These have helped them to build experience in monitoring, reporting, and verifying GHG emissions at the company and project-level and facilitated identifying emissions abatement opportunities.

Company level regimes

At a company-level, there is well-established international protocols for voluntary accounting and reporting of GHG emissions. The WBCSD/WRI GHG Protocol Corporate Standard, updated in 2004, is the most widely used of these and has become a de-facto standard for voluntary corporate GHG accounting and reporting. This is summarized in Box 1.

The WBCSD/WRI GHG Protocol and other company-level reporting requirements have been applied across a number of regions. As a result, successful partnerships have been established to facilitate the design and implementation of GHG accounting and reporting programs in several regions including: Brazil, China, India, Mexico, the Philippines, and North America, as a means of promoting more harmonization of GHG markets and building capacity for further collaboration.

As well as supporting the development of programs in countries across the world, the GHG Protocol forms the basis against a common international framework.

“The GRI guidelines are the leading global standards in sustainability reporting which are now in their third generation (G3) and include a requirement to report on a number of emissions-related metrics.”

Box 2: IFC Performance Standards

For some time the IFC Performance Standards have been applied as a de-facto international benchmark for managing environmental and social performance of major infrastructure projects in developing countries, including projects in the mining and metals industry. Compliance with the standards has been required by international investors. This has included an element of project-level GHG accounting. Version 2 of the IFC Performance Standard 3, released in 2010, has introduced additional requirements around GHG accounting:

“For projects that are expected to or currently produce more than 25,000 tonnes of CO2e annually, the client will quantify direct emissions from the facilities owned or controlled within the physical project boundary as well as indirect emissions associated with the off-site production of energy used by the project. Quantification of GHG emissions will be conducted by the client annually in accordance with internationally recognized methodologies and good practice.”

The GRI framework includes guidelines on how to report against specific indicators of sustainable development and on specific sector supplements. In May 2008, all ICMM member companies committed to publicly report on their sustainable development performance on an annual basis in accordance with the GRI guidelines and the Mining and Metals Sector Supplement. Many ICMM member companies are also now seeking third party assurance of the GHG emissions data in their voluntary reporting.

Voluntary corporate disclosure of GHG emissions and other climate change-related information is increasing not only through the GRI but also via initiatives such as the Carbon Disclosure Project (CDP) which is backed by major investors. This requests companies to disclose information on their management of climate change risks and opportunities (including governance frameworks, company strategy and emissions reduction initiatives) as well as GHG emissions performance via an annual questionnaire. The CDP encourages participating companies to assess their responses in accordance with the principles of the GHG Protocol and encourages adherence to a reporting framework relating to recognized global standards e.g. the GHG Protocol and ISO14064-1. Many of ICMM members disclose information to the CDP on an annual basis and have done so for several years. The success of these initiatives reinforces the case for developing national and international GHG accounting and reporting programs to be informed by existing, proven approaches.

Project-level MRV regimes in the mining and metals industry

Investment in the mining and metals industry requires large amounts of capital and forward planning due to a likely long lifespan. For major project-level development, ICMM members will typically apply their corporate GHG accounting requirements. In cases where external finance is involved, GHG accounting will often follow the requirements set by the International Finance Corporation (IFC) Performance Standards (summarized in Box 2).
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Estimating GHG emissions for the mining and metals industry

In the context of differing MRV regimes, the mining and metals industry faces a number of challenges for estimating GHG emissions, some of which are outlined below.

The heterogeneous nature of the mining and metals industry

The mining and metals industry is a highly diversified sector involving extraction, sorting and basic processing of many different metals and minerals, using a range of methods in a wide variety of local conditions. The commodities that are mined have many different applications and undergo different types of beneficiation and processing. Depending on the type and location of mineral resources, there are widely differing technical approaches to resource extraction and processing and each has a certain GHG profile.

The heterogeneous nature of the sector explains why there has been no development of a mining and metals industry GHG accounting protocol in the way that some other industries have developed sector-specific guidelines. Instead, various commodity groups within the mining and metals industry have conducted work on detailed GHG accounting protocols that reflect the particular value chain steps, processes and sources of GHG emissions that are relevant to its members. An example is the International Aluminium Institute which is summarized in Box 3.

The mining sector is more heterogenous than other industrial sectors such as cement, iron and steel, pulp and paper and oil and gas production – even taking into account the different technologies and operating conditions that apply to those other sectors.

Nevertheless, the mining and metals industry has gained experience and followed sector and sub-sector reporting procedures across multiple jurisdictions. To achieve transparent and comparable GHG reporting in the mining sector, approaches have to be appropriate for the specific sub-sector activity in question and have to be applied consistently in parallel situations to deliver meaningful results.

Accurately defining sector boundaries

The example of aluminium in Box 3 illustrates the challenge of accurately defining the boundaries of the mining and metals sector and the degree to which there is vertical integration across the value chains of the different commodities produced by the sector. A number of mining and metals companies operate a suite of global facilities and are vertically integrated along the value chain from mining through to refining/smelting and fabrication. Different commodities will have different levels of vertical integration. It is also extremely difficult to accurately calculate the contribution of emissions from artisanal mining as these are small-scale, likely to change frequently and often there is lower capacity to measure emissions.

Box 3: The Aluminium Sector GHG Protocol

This was developed by the International Aluminium Institute (IAI) and published in 2006 – http://www.world-aluminium.org/cache/fl0000127.pdf.

It takes the form of an addendum to the WBCSD / WRI GHG Protocol: Corporate Standard and is aligned with IPCC national GHG inventory guidance and ISO 14064 as well as GHG measurement standards such as the USEPA PFC Measurement Protocol. As well as reiterating the guidance provided by the GHG Protocol: Corporate Standard, and providing sector-specific examples for the key topics addressed by that document, it provides specific guidance to the international aluminium industry and stakeholders on:

- emission sources
- definitions
- measurement and calculation methodologies, including calculation tools [http://world-aluminium.org/cache/fl0000188.xls]
- inventory boundaries
- best practices in GHG measurement and reporting.

It has enabled a consistent sectoral approach to monitoring, reporting and verification of GHG emissions across the international aluminium industry. Company-based reporting is aligned with the measurement of sector-level key performance indicators on direct greenhouse gas emissions reduction. This allows the IAI to collect and publish annual data covering over 60% and up to 100% of the global aluminium industry’s emissions.

“Depending on the type and location of mineral resources, there are widely differing technical approaches to resource extraction and processing and each has a certain GHG profile.”
The categories of emissions from the mining and metals industry which are not recorded separately in national GHG inventories include emissions from:

- stationary combustion used during mining activities (which are typically included in the “energy” sector)
- emissions from mobile combustion used in the transport of ores and metals by sea, road and rail (which are included in the “transport” sector)
- emissions from electricity used for energy intensive processes, such as electrolytic smelting (which are included either in the “energy” sector if the plant is buying the electricity from the grid, or in the “industry” sector, if the plant produces its own electricity on-site).

These examples illustrate the complexity of sector boundaries and show how emissions from an industry sector such as the mining and metals industry are spread across the national communication and IPCC categories.

The categories of emissions from mining and metals production which have specific guidelines and methodologies under the 2006 IPCC Guidelines for National GHG, include:

- CO₂ and CH₄ emissions from the production of iron and steel from iron ore
- emissions from metallurgical coke production from coal
- emissions from ferroalloy production from iron and one or more metals such as silicon, manganese, chromium, tungsten etc.
- CO₂ emissions and PFC emissions from aluminium production from alumina, caused by the consumption of carbon anodes in the process
- emissions from the production of lead bullion from lead concentrates
- fugitive CH₄ emissions from coal mining, which are accounted for separately as fugitive emissions from the energy sector.

A changing international MRV regime
Where national GHG inventories submitted to the UNFCCC use estimation, modelling, sectoral averaging or other top-down approaches for compiling emissions data in some given categories, it is very difficult to reflect bottom-up progress in specific sectors. This may necessitate changes to current MRV regimes.

In addition, there will be new scrutiny placed on measuring the outcome of actions under countries’ emission reduction pledges under the Copenhagen Accord, and Nationally Appropriate Mitigation Actions (NAMAs) undertaken in developing countries. Future UNFCCC negotiations may bring about further changes in MRV requirements. There are currently no specific guidelines for MRV agreed to under the Copenhagen pledges on NAMAs negotiations.

Whatever MRV guidance is eventually agreed to is likely to be a minimalist scenario. This opens up the real possibility of a plethora of MRV regimes designed on a state-by-state basis.
The International Council on Mining and Metals (ICMM) was established in 2001 to improve sustainable development performance in the mining and metals industry. Today, it brings together many of the world’s largest mining and metals companies as well as national and regional mining associations and global commodity associations. Our vision is one of leading companies working together and with others to strengthen the contribution of mining, minerals and metals to sustainable development.

Summary and conclusions

Developing MRV guidelines driven by national-level policies will likely lead to a patchwork of different national/regional systems, creating varying rules for industry members to have to adhere to in different jurisdictions. This will complicate compliance measures greatly, with increasing associated costs. As Parties adopt post-2012 climate change targets, policies and reporting requirements, these commitments will trickle down to action across different sectors of the economy. Ensuring MRV guidelines are as consistent and transparent as possible reduces the compliance costs on industry operating globally and allows for more standardized, transparent approaches to MRV which measures progress over time.

As outlined in this paper, ICMM members have a decade of experience of sector-level MRV, within the framework of the existing voluntary programs and mandatory regimes. They face industry-specific challenges in MRV including: the heterogeneous nature of the sector – even at the commodity and installation levels, difficulties with defining sector boundaries, fugitive emissions source, identifying appropriate and meaningful metrics to reflect the diversity of the sector, different sector classification across jurisdictions and a frequently changing MRV regime. Some of these challenges apply in other sectors. As such, the mining industry’s experience makes it well placed to contribute to the debate on MRV at a national and international level.

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