



METALS: ENERGY, EMISSIONS AND THE ENVIRONMENT

This second INSG Insight in the series looks at the question of the non-ferrous metals industries' environmental footprint. In January 2008 the European Commission published its proposals for the third phase of carbon emissions trading after 2012. The future inclusion of non-ferrous metals prompted industry participants to come together for the first time in February¹ to discuss the question of energy usage, how to reduce emissions of greenhouse gases (GHGs) and how to improve environmental performance.

The recent conclusion of phase 1 of the European Union's Emissions Trading Scheme (ETS) has allowed market players and regulators to assess its performance against the original objectives of the scheme. Most observers agree that the scheme was only partially successful. Although an organised electronic market for carbon permits was created, within six months the carbon price effectively collapsed. The supply of carbon allowances exceeded demand.

In a bid to avoid a repeat of a carbon price crash during the second trading period, in October 2007 the European Commission announced a 10% reduction in the emissions that member states are allowed to emit forcing some countries to slash their suggested targets by as much as 50%. Phase 3 of ETS will be extended to non-ferrous metals.

The extension of ETS in the EU, and the imminent introduction of similar regulatory and voluntary schemes in North America, Australia and Japan pose a challenge to the international non-ferrous metals industry but also offer opportunities to make efficiency gains. The industry is likely to respond by developing carbon risk reduction and management strategies that aim to:

- Improve the industry's understanding of its carbon footprint relative to competing sectors (such as plastics)
- Develop lower carbon products (through improved energy efficiency)
- Enhance its image and metal brands (through emphasizing recycling and sustainable usage).

Comments or Questions

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¹ Metal Bulletin's Metals: Energy, Emissions and the Environment Conference

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Introduction

In December 2007 the United Nations conference on climate change that was held in Bali focused attention once again on the need to promote global reductions in greenhouse gas (GHG) emissions to counter the rise in global average temperature. There was agreement at the conference on the value of worldwide industry approaches as well as national measures to tackle GHG emissions. Metals, which are energy intensive to produce as well as being globally traded and priced, are obvious candidates for voluntary and/or regulatory initiatives to reduce GHG emissions. Over the next four years they look certain to be included in regulatory mechanisms to tackle climate change.

The Advent of International Carbon Emissions Trading

International policy makers have chosen to meet the challenge posed by climate change in a number of ways including a market-based approach that relies on generating a price for carbon emissions by industry. The best known of these initiatives is the European Union's Emissions Trading Scheme (ETS), phase 1 of which began in January 2005.

ETS was the first international trading system for CO₂ emissions and it covered about 12,000 installations across the European Union. Each Member State drew up a National Allocation Plan (NAP) that determined the total quantity of CO₂ emissions that were granted to companies. These emissions allowances were intended to be bought or sold by the participating companies in each member state. One allowance gave companies the right to emit 1 tonne of CO₂, and the total CO₂ allowance allocation for each installation were to be reduced below existing emission levels each year to meet Kyoto targets.

The first trading period lasted between 2005 and 2007. It was expected that when Member States began to limit CO₂ emissions, carbon allowance scarcity would result in encouraging the most cost efficient reductions to be made first across the entire EU market so that low carbon emitting companies could sell their excess carbon allowances to less carbon-efficient producers. Overall a net reduction of emissions during 2005 to 2007 was expected.

The EU's Greenhouse Gas Emissions Allowance Trading Directive of 2003 specified that during phase one of ETS the production and processing of ferrous metals, energy activities, the pulp and paper industries as well as the glass, cement and ceramic industries were to be subject to carbon allowances. Non-ferrous metals were not included in phase 1.

First Results in the European Union

The recent conclusion of phase 1 of ETS has allowed market players and regulators to assess its performance against the original objectives of the scheme. Most observers agree that the scheme was only partially successful. Although an organised electronic market for carbon permits was created, within six months the carbon price effectively collapsed. The supply of carbon allowances exceeded

demand. Many analysts believe that the CO₂ quotas embodied in the EU's 25 NAPs were simply too generous to create the desired scarcity and resulting elevated permit prices that would encourage efficient carbon emitters to sell their excess quotas and inefficient carbon emitters to bid for higher allowances. Indeed, official EU data published in May 2006 showed that a group of countries, including large polluters such as Germany, were left with 44.1 million tonnes extra CO₂ allowances for the year 2005. Among the EU's major polluters, only the UK had emitted more than its quota, forcing it to buy over 30 million tonnes extra allowances on the EU carbon market.

Phase 1 of ETS came in for additional criticism due to the barriers to competition that are perceived to characterise the European energy market. Between 2002 and 2007 wholesale electricity costs in Europe soared (by 350% in France, by 250% in Germany and by 323% in the United Kingdom). The energy sector was included in phase 1 of ETS and many energy intensive industries, including the metals sector, believe that the energy utility companies were simply able to pass on the cost of ETS carbon quotas to their wholesale customers in the form of higher energy prices, negating the need to trade permits between other ETS participants to pay for inefficient carbon emissions. It has been argued that if the EU energy market were to be opened up to competition (at the moment there is no EU international power grid and state owned generators dominate a number of EU national power markets) power utilities would find it much more difficult to pass on carbon costs to customers who are at the moment captive. In reply the energy utility companies point out that electricity cost rises in Europe simply mirror rising international oil, gas and coal prices.

Phase 2 of ETS and future reform

Phase 2 of ETS is set to run from 2008 until 2012. In an bid to avoid a repeat of a carbon price crash during the second trading period, in October 2007 the European Commission announced a 10% reduction in the emissions that member states are allowed to emit (to a total of 2.08 billion tonnes for the period), forcing some countries to slash their suggested targets by as much as 50%.

In March 2007, EU leaders agreed that, by 2020, they would cut overall greenhouse gas emissions by 20% compared to 1990 levels. The Commission said this will require a "much steeper reduction path" for industrial emissions, and on 23 January 2008 it presented an ETS reform proposal for the post-2012 period that is designed to achieve this target.

The reform package includes:

- **Capping of total EU industrial emissions at 21% below 2005 levels by 2020** – i.e. a maximum of 1720 million allowances – with total emission allowances cut by 1.74% annually as of 2013. The EU-wide target replaces the current 27 national targets.
- **Enlarging the scope** of the scheme to **new sectors**, including aviation, petrochemicals, ammonia and the aluminium sector, as well to two new gases (nitrous oxide and perfluorocarbons), so that around 50% of all EU emissions would be covered. Road transport and shipping remain excluded, although the latter is likely to be included at a later stage. Agriculture and

forestry are also left out due to the difficulties related to measuring emissions from these sectors with accuracy.

- **Sectors not covered by the ETS**, such as transport, buildings, agriculture and waste are to achieve an **average GHG reduction of 10% by 2020**. To achieve this, the Commission has set national targets according to countries' GDP. Richer countries are asked to make bigger cuts – up to 20% in the case of Denmark, Ireland and Luxembourg – while poorer states (notably Portugal, as well as all countries that joined the EU after 2004 except Cyprus) will be entitled to increase their emissions in these sectors – by up to 19 and 20% respectively for Romania and Bulgaria – in order to take into account their high expectations for GDP growth.
- **Smaller installations**, emitting under 10,000 tonnes of CO₂ per year, will be allowed to opt out from the ETS, provided that alternative reduction measures are put in place.
- Industrial GHGs prevented from entering the atmosphere through the use of **carbon capture and storage (CCS)** technology are to be credited as not emitted under the EU Emissions Trading Scheme.
- **Auctioning**: The proposal foresees a huge increase in auctioning as early as 2013. While today, 90% of pollution allowances are handed out to industrial installations for free, the text states that "around 60% of the total number of allowances will be auctioned in 2013". It adds that "full auctioning should be the rule from 2013 onwards for the power sector". This is expected to lead to a 10-15% rise in electricity prices. In other sectors, free allocation will gradually be completely phased-out on an annual basis between 2013 and 2020. Nevertheless, certain energy-intensive sectors could continue to get all their allowances for free in the long term if the Commission determines that they are "at significant risk of carbon leakage", i.e. relocation to third countries with less stringent climate protection laws. Sectors concerned by this measure are yet to be determined.
- The **distribution method for free allowances** will be developed at a later stage by expert panels within the Commission. The Commission nevertheless says that "the rules may for instance specify that allocations are to be based on benchmarks, e.g. a number of allowances per quantity of historical output".
- **Competitiveness**: The Directive stresses that the risk of "carbon leakage" – and subsequently, the need for compensatory measures for European companies – is dependent on whether or not an international agreement subjecting all countries to similar climate change mitigation measures is reached. It therefore delays any decision on eventual compensation measures until 2011, when the Commission will have to present a review of the situation. If no global pact is reached by then, some sort of "carbon equalisation system" will be introduced – whether in the form of additional free allocations or through the inclusion of carbon-heavy imports from third countries in the ETS.
- **Flexibility and third countries**: Assuming a global climate change deal is reached, member states will continue to be entitled to meet part of their target by financing emission reduction projects in countries outside the EU

(although the use of such credits will be limited to 3% of member states' total emissions in 2005).

Other International Carbon Trading Initiatives

The concept of emissions trading had been built into the Kyoto Protocol on Climate Change through its Joint Implementation (JI) and Clean Development Mechanism (CDM). These are intended to foster technology transfers to developing countries (CDM) and other industrialised nations (JI) which have signed up to the Kyoto Protocol.

In North America a voluntary market for carbon permits has been operating in Chicago at the Chicago Climate Exchange. A number of companies are implementing voluntary carbon offsets and there are a number of state-level initiatives in the US including the Regional Greenhouse Gas Initiative (RGGI) and the Western US Initiative. In Canada carbon intensity targets have been set for large emitters.

An emissions trading scheme is due to start in New Zealand in summer 2008 which will cover all emissions by 2013. Australia's emissions trading scheme is scheduled to start in 2011 covering over 70% of emissions (excluding agriculture and forestry). In Japan the focus is expected to be on voluntary schemes.

In the rest of Europe outside the European Union, Switzerland is to introduce a voluntary scheme in 2008. Norway and Iceland are to participate in the EU's emissions trading scheme.

The Metals Industry's Position

The non-ferrous metals industry is generally supportive of emissions trading. Although non-ferrous metals were not included in the "trading sectors" for the 2005-2007 ETS period, the industry, in common with the other energy intensive industries of the EU (including the steel, glass and cement industries) focused attention on the potentially adverse impact on EU competitiveness that could arise from ETS implementation by the EU in the absence of similar international schemes. The non-ferrous metals industry believes that its inclusion in ETS could:

- Distort trade and harm the competitiveness of the EU's non-ferrous metals industry if the Kyoto protocol were implemented unilaterally by Europe. Since non-ferrous metals are commodities where prices are set in the global market increases in local costs cannot be passed on to customers. The implication is that "carbon leakage" would occur i.e. the EU non-ferrous metals industry may lose business to non-EU competitors that are not subject to any greenhouse gas emissions limitations and have lower production costs (this concern is addressed in the Commission's phase 3 reform package)
- Increase the marginal cost of producing energy resulting in higher energy prices. European non-ferrous metals production is already sensitive to energy costs which represent an important part of total production cost. Industry feels that it is already largely energy efficient and gains from further

investment are likely to be limited in nature. ETS is expected to impact on coal-fired energy generation more than gas-fired generation, whilst renewable and nuclear generation will not be affected as their emissions of CO₂ are either negligible or zero.

The non-ferrous metals industry fears that the lack of intense competition in the EU power market will mean that power companies will simply continue to pass on their full carbon emissions cost onto wholesale power prices, regardless of the source of electricity. This is significant since power purchased from sources without CO₂ emissions may be as high as 80% in the Nordic countries, or 60% in Germany, but power consuming industries may be charged as though 100% of their power used is from sources with CO₂ emissions. ETS could therefore represent a “windfall profit” to the EU’s power generators which the European energy intensive industries have calculated would be €612 million annually for non-ferrous metals (of which €490 million would come from the aluminium industry).

The energy intensive industries have therefore called for:

- a) Transparent electricity prices
- b) Unbundling of CO₂ trading and power prices as separate markets
- c) A monitoring mechanism on the impact of the ETS on power prices
- d) Commitment to true liberalisation of the electricity market.

Non-Ferrous Metals Industry Preparations for ETS Phase 3

The non-ferrous metals industry has begun to address the challenge of stricter carbon emission caps in Europe and the setting of a much higher carbon price. It is likely to focus on four principal areas of action:

- **Data on existing emissions and energy usage** needs to be gathered so that both industry and regulators are fully aware of the current situation
- **Life cycle inventories** need to be completed, using agreed common methodologies, to allow better estimation of each metal’s “carbon footprint” throughout the extraction, production, usage, disposal and recycling phases
- **Secondary metal production and recycling activity** data needs to be improved to justify claims of sustainable production and usage of metals
- **Strategies on managing carbon risk** need to be introduced that involve lowering carbon emissions, participating in emissions trading and buying international carbon credits through the Kyoto CDM and JI mechanisms.

It is increasingly likely that carbon and climate change factors will be incorporated into the non-ferrous metals industry’s strategic decision making as formal participation in ETS draws nearer. There are efficiency gains to be made by early movers. Projects to reduce emissions look likely to deliver improvements in efficiency, lower costs and the generation of new revenue schemes from selling carbon assets. The first wave of projects to reduce carbon emissions look set to focus on improving energy efficiency, recovery of waste heat for re-use and power generation and switching to lower carbon fuels.

The Study Groups and Climate Change

The Study Groups offer a forum for sharing information on emission trading schemes, and on carbon risk reduction and management strategies. Through the Joint Recycling Project Team they also offer a route to improving data on secondary metal recycling rates and production. In collaboration with the non-ferrous metals industry associations the Study Groups are in a position to share expertise on material flows (such as the ICSG copper material flow model) that will form the basis of building more complete Life Cycle Inventories (LCIs) for metals. LCIs represent the best route to substantiating data on carbon footprints of metals throughout their production, usage and recycling chains. The Study Groups may also contribute by assessing trends in the substitution of non-ferrous metals in end use applications due to either cost, technological or environmental factors.

Conclusions

The European Commission's ETS reform package, the introduction of emissions trading in Australia and the extension of voluntary emissions trading in Japan and North America has focused attention on the need to prepare carbon risk reduction and management strategies in the non-ferrous metals industry.

There is a relatively small window for the non-ferrous metals industry to prepare for emissions trading in the European Union (details of which are likely to be finalized by the end of 2011). In the meantime the spread of ETS in other regions of the world is likely to contribute to growing awareness of the carbon emission profiles of metals by customers which may change their purchasing behaviour. The non-ferrous metals industry will need to improve its understanding of its carbon footprint relative to competing sectors (such as plastics) in order to develop lower carbon products, and enhance its image and metal brands. Senior management is likely to engage in developing carbon risk reduction and management strategies across all the major non-ferrous metals sectors.