

The Ferroalloy Industry and Global Climate Change: Risk Minimization and Economic Opportunity

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BACKGROUND

More than two centuries ago, Jean Baptiste Joseph Fourier used the metaphor of a "hothouse" to explain his theory that some gases in the atmosphere allow visible shortwave sunlight to strike the Earth's surface, where it is converted to longwave infrared heat, but do not allow all of the radiated heat to escape back into space. Some 50 years later, John Tyndall measured the heat trapping abilities of carbon dioxide and water vapor and concluded that the Earth's surface temperature could be altered by changing the atmospheric concentration of these gases. In the 1890's, Svante Arrhenius, noting that society was rapidly increasing the rate of coal burning, predicted that a doubling of atmospheric carbon dioxide would raise the average planetary temperature by 8 to 10 degrees Fahrenheit.¹

Between 1850 and 1992 atmospheric concentrations of carbon dioxide grew from 278 parts per million to 356 parts per million.² At this rate of growth, atmospheric concentrations will double their pre-industrial levels by 2100. In June 1988, James Hansen, a NASA scientist, testified to the U.S. Senate that global surface temperatures had risen one degree Fahrenheit since 1900 (about three times normal expected variability) and that it was "99 percent certain" that this trend was the result of increased carbon dioxide in the

atmosphere. While Dr. Hansen's "99 percent certainty" was almost certainly an exaggeration, the international community took note of this disturbing trend.

In 1992, recognizing the potentially disastrous effects of rising atmospheric concentrations of greenhouse gases, representatives of 160 nations gathered in Rio de Janeiro and signed the United Nations Framework Convention on Climate Change (UNFCCC). The objective of the UNFCCC was "the stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic (human-caused) interference with the climate system."³ Under the UNFCCC, primary responsibility for reducing emissions was assigned to developed countries. A Conference of Parties to the Convention was to be called periodically to discuss methods for, and progress in, implementing the UNFCCC. The first two Conferences of Parties yielded strong disagreements on the domestic and international policy instruments to be employed to curb greenhouse gas emissions. There was also considerable disagreement on what, if any, targets and timetables should be set for achieving emission reductions. Most developed countries announced a series of voluntary targets and initiatives for meeting emission reduction goals.

By 1996, it became clear that greenhouse gas emission levels in most developed countries were rising despite voluntary efforts to reduce emission levels. A

¹ Douglas Cogan, *The Greenhouse Gambit: Business and Investment Responses to Climate Change*, (Investor Responsibility Research Center, Washington, DC) 1992, pp.5-8.

² Intergovernmental Panel on Climate Change, *Climate Change 1995: The Science of Climate Change* (Cambridge, UK: Cambridge University Press, 1996), pp. 92-93.

³United Nations Environment Programme, Information Unit for Conventions, *United Nations Framework Convention on Climate Change*, Article 2.

consensus for firmer emission reduction targets and timetables was building. By the third Conference of Parties held in Kyoto, Japan during December 1997, developed nations agreed to a series of firm emission reduction targets. They agreed to reduce emissions by an average of 5.2% from 1990 levels by 2008 – 2012. However, the United States Senate refused to ratify the Kyoto Protocol to the UNFCCC, expressing concerns about the costs to the United States economy and the exclusion of non-industrialized nations from the Protocols requirements. Recently, the new Bush Administration has described the Kyoto Protocol as “dead on arrival.” Because the United States is responsible for roughly one-quarter of all global greenhouse gas emissions, this pronouncement severely jeopardizes any prospects of implementing the Kyoto Protocol.

IF NOT KYOTO, THEN WHAT?

The evolution of international climate change mitigation policy has taken place against a backdrop of increasingly dire warnings from the scientific community. The second assessment of the Intergovernmental Panel on Climate Change (IPCC) stated that the “balance of evidence... suggests a discernible human influence on global climate.” This evidence included an increase in global sea levels between 10 cm and 25 cm and an increase in global temperatures of between 0.3 and 0.6 degrees Centigrade over the last century.⁴ The third scientific assessment of the IPCC⁵ is even more chilling. Findings from this report include:

- The atmospheric concentration of carbon dioxide has reached levels not

seen in 420,000 years and likely not seen in the past 20 million years;

- There is new and stronger evidence that most of the warming observed over the last fifty years is attributable to human activities;
- The global average surface temperature is projected to increase by 1.4 to 5.8 degrees centigrade by 2100; and
- Anthropogenic climate change will persist for many centuries.⁶

Responding to this information, the international community, led by the European Union (EU), has already begun to take steps to reduce greenhouse gas emissions. The EU has pledged to implement the Kyoto Protocol with or without U.S. participation. Denmark has already initiated a cap and trade system for their utility sector. The United Kingdom (UK) plans to go active with a domestic carbon trading system this year. The Dutch government is currently offering tenders for emission reductions. The World Bank’s Prototype Carbon Fund has US\$145 million to buy greenhouse gas emission reductions, and planning for an EU-wide cap and trade system by 2005 are under way. Even President Bush has stated that he takes the climate change problem seriously, supports the spirit if not the details of the Kyoto Protocol, and will be offering up better alternatives in the near future.⁷

The private sector, recognizing that this is a real problem that will not go away, has begun taking action to reduce greenhouse gas emissions prior to the implementation of any national or international regulatory regime. The list of firms taking early actions include such notables as Alcan, British Petroleum, Dupont, TransAlta, Ontario Power Generation, Pechiney, Shell, and

⁴ Intergovernmental Panel on Climate Change, *Second Assessment Report: Climate Change 1995*.

⁵ This assessment contained the work of 122 lead authors, 515 contributing authors and 337 expert reviewers from 99 countries.

⁶ Intergovernmental Panel on Climate Change, *Third Assessment of Working Group I: Summary for Policymakers*, January 2001.

⁷ Washington Post, *Bush to Drop Annual Review of Weapons Sales to Taiwan*, (April 23, 2001), p. A1.

Suncorp. These firms are achieving internal reductions and some are trading reductions among themselves to achieve a least-cost approach to mitigation. The current volume of carbon trade equals about 74 million tons annually, with the market expected to more than double over the next ten years – even in the absence of the Kyoto Protocol.⁸ Traded carbon has been priced anywhere from \$0.25 to \$10.00 per ton. A German firm recently tendered an offer to purchase up to five million metric tons at \$5.00 per metric ton.

HOW DOES THIS AFFECT THE FERROALLOY INDUSTRY?

Some 80 to 85 percent of all greenhouse gas emissions are the result of fossil fuel combustion with about a third of that total attributable to electric generation. As a large energy consumer, the ferroalloy industry is likely to be a large emitter of greenhouse gases (except in areas where electric generation is primarily hydropower-based). Further, ferroalloy manufacture may also have additional process emissions. Thus, the industry faces significant regulatory risk. However, there is a potential upside to this regulatory risk. Now that a market for emission reductions is maturing, the ferroalloy industry possesses a potentially large reserve of a new, valuable commodity. Greenhouse gas emissions reduced through efficiency gains or process improvements can be documented, verified and sold. This offers the prospect of a virtuous cycle where efficiency gains can yield carbon credits and revenues from credit sales may be reinvested in additional efficiency gains that yield more carbon credits. In the U.S., for example, the average mWh of electricity generated produces 0.586 metric tons of carbon dioxide. At a conservative market price of \$5.00 per metric ton carbon dioxide, each

mWh saved equals a commodity worth \$2.93. In some countries, under some legislation, efficiency gains already achieved may be eligible for “early crediting” and the associated greenhouse gas emission reductions monetized.

WHAT SHOULD THE INDUSTRY DO NEXT?

At a minimum, the ferroalloy industry must take stock of its regulatory risk and the potential opportunity associated with greenhouse gas emissions. Specifically, it should:

- 1) Complete a survey of existing and pending legislation and regulations across countries where operations are in place;
- 2) Conduct an inventory of industry-wide and company-specific greenhouse gas emissions back to 1990;
- 3) Catalogue all early emission reduction activities (those that have taken place since 1990); and
- 4) Register early emission reduction activities in jurisdictions that have existing programs.

After taking stock, the industry may wish to initiate a more aggressive plan to monetize future emission reductions. This would include:

- Evaluation of emission reduction opportunities;
- Cost analysis of emission reduction alternatives;
- Regulatory risk minimization and commodity optimization strategies;
- Emission reduction project design;
- Emission reduction monitoring and verification;
- Emission reduction reporting;
- Identifying purchasers of emission reductions; and/or
- Development of industry-wide internal trading system.

⁸ Paul Vickers, TransAlta, *Implementing JI and CDM: Practical Issues*, Presented at Implementing JI And CDM: Project Finance in a Carbon Economy, (New York, February 27, 2001).

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