

REDUCING CO2 IN CARBON-INTENSIVE SECTORS
(ESPECIALLY STEEL): SHORT-TERM COMPETITIVENESS
ISSUES/LONG-TERM PARADIGM CHANGES

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A world that seeks to decarbonise poses sharp problems for carbon-intensive industry. Energy-intensive sectors make a disproportionate contribution to CO2 emissions from industry: three sectors, iron and steel (integrated works), non-metallic minerals (mainly cement), and chemicals and petrochemicals account for 70% of direct industrial CO2 emissions. But other sectors, such as aluminium, iron and steel (electric arc furnaces), and pulp and paper, are electricity-intensive, and account indirectly for substantial emissions in power supply.

Most of these industries are international. They compete on cost, on quality and on service. If climate change policies increase costs in one country, but not in another, then operations and jobs could move to where costs are lower - "carbon leakage". If they move from an efficient producer to a less-efficient producer, this might actually increase CO2 emissions.

Of these industries, the iron and steel sector is the most challenging case-study. The integrated route accounts for 60-65% of steel made and about 2bn tons of CO2. Globally, the production of steel is now rising fast, principally because of China, whose production has increased from 150mt in 2001 to 489mt in 2007. This has transformed the competitive situation in the steel industry, making access to raw materials critical and placing new pressures on the integrated steel businesses of the EU, Japan and Korea which rely on sea-borne raw materials. In this situation, they strongly oppose additional burdens from climate change policies.

What are the implications of this for a steel industry pathway to 2050? Unfortunately there are

no quick technological fixes - the classic integrated works cannot easily be decarbonised. Steel industry leaders, coordinated through the International Iron and Steel Institute (IISI), are now co-funding work on more radical "breakthrough technologies", including CCS, new smelting processes based on hydrogen and electricity, and carbon from sustainable biomass.

One solution proposed to address CO₂-intensive industries is Sectoral Approaches or Agreements (SAs). SAs could set benchmarks of CO₂ intensity and encourage the fast diffusion of best practice; they could also provide a framework for public-private partnership to achieve technological breakthroughs. Beyond this, SAs could also provide incentives to reward best practice and penalise less-good practice. But if they are to avoid competitive distortions, they would also require global participation. If global SAs prove impossible, then the steel industry will call for "border tax adjustment" to limit "carbon-unfair" imports.

On the road to 2050, the steel industries of the EU and Japan will need to demonstrate their contribution to decarbonisation by (a) accelerating the development and implementation of "breakthrough technologies" (b) engaging with the steel industries of emerging - and competitor - countries such as China to accelerate similar implementation and (c) cooperating with customer industries in developing lower-weight, higher value products.

These changes will be disruptive. They require "deep paradigm changes" (IISI). But the stakes are high - 2bnt of CO₂ in integrated steelworks (and growing), more indirectly in electric arc furnaces.