7th Annual Workshop on Greenhouse Gas Emission Trading

Paris October 9th 2007
Steel industry highlights

• Steel together with cement and wood are the big 3 of the materials used by mankind
• Change in steel consumption is closely linked to economic growth in developing countries
  – 75-99’ world production ~ 800 Mt/y
  – Awakening of China since 2000 ⇒ growth steel use 7% per year
  – World production ~ 1250 Mt in 2006 – 2000 Mt before 2020
• Only 450 Mt/y can be made out of scrap ⇒ Growth to be covered by primary production emitting 2-4 t CO$_2$/t
• Steel accounts for ~ 6% of World CO$_2$ emissions
Addressing the Climate Challenge

• The steel industry has to move forward to cut its emissions
  – Ultimately technology will provide the solution (ULCOS & CCS)
  – ETS with absolute Caps lack positive incentive for innovation: high CO₂ cost does not help if competitiveness is affected

• Steel industry needs policies that are likely to become Global
  – Developing countries will not accept a cap on their activity
  – Developing countries need policies to move them in the right direction without distorting global markets
Paving the Future - ULCOS

• Breakthrough technologies for **Ultra Low CO₂ Steelmaking**
  – European project with 48 partners, part of IISI worldwide project
  – Targeting at least 50% reduction of primary iron emissions
  – 59 M€ for a 5 year program initiated in 2005
• Four solutions selected for further study
  – New Direct Reduction + CCS
  – New Blast furnace + CCS
  – Smelting Reduction + CCS
  – Electrolysis - Electricity based
• Pilot/demonstration phase starting 2010 (??)×100 M€ per route
• Solutions will be (??)>50 €/t more expensive than today – How to finance?
Problems with Absolute Caps on CO$_2$

- **Distorts competition**: between industries & materials with different cycles
- **Loss of competitiveness of affected industry** vis-à-vis third countries
- **Failure to effectively reduce emissions**
  - Absolute Caps only target direct emissions – results in delocalisation of emissions outside the trading space and increased global GHG emissions
- **Failure to reward improvements** or recognise past efforts
- **No** sustainable incentive for innovation
- **Operational difficulties** due to the allocation system
- **Huge and unjustified increase** of electricity costs
- **Unattractive** to 3$^{rd}$ countries therefore unlikely to be globalised
Industry was asked to think about a sector wide approach to help reduce the CO\textsubscript{2} problem in a cost effective way

EU steel industry worked three years to develop a proposal supported by all steel makers

Basis of every policy is a tool to compare and identify the most CO\textsubscript{2} efficient ways of making steel

- Complexity of steel production routes sets a challenge
- A sensible approach needs to address:
  - CO\textsubscript{2} not Energy – CO\textsubscript{2} inefficiencies are too easy to hide
  - Indirect & Upstream emissions – ‘Simple’ benchmarking doesn’t work
  - Recycled & Primary steels need a separate treatment

Development of a generally accepted baseline calculation model is a significant achievement
Difficulties comparing performances

- A one step process producing a single product can be easily benchmarked.
- Steel is the result of a chain of processes:
  - Influencing each other
  - With many indirect emissions on different stages
  - Using different technologies
  - Producing simultaneously several co-products deserving to be credited
- To compare, the entire production chain is to be integrated:
  - The individual contribution needs to be compared to a ‘baseline’
Three rules for the ‘baseline’ calculation

1. **Every product has a unique upstream CO₂ value** corresponding to the average performance of the group

   - Electricity: 370 kg CO₂/MWh; Steam: 180 kg CO₂/t; Pellets: 115 kg CO₂/t; DRI: 760 kg CO₂/t; Burnt lime: 1 150 kg CO₂/t…

2. **by-products, substituting other products**:
   1. Energetic by-products: the real CO₂ emission when using the product except when it is higher than the emission of the substituted product
      - BF-gas: emits 270 kg CO₂/GJ and replaces Nat. gas 56 kg CO₂/GJ
      - => BF-gas receives 56 kg CO₂/GJ; pig iron is charged with 214 kg CO₂/GJ
   2. Material by-products: the effective CO₂ cost when producing one marginal unit except when it is higher than the emission of the substituted product
      - granulated slag replaces clinker costing 900 kg CO₂/t => BF-slag receives 550 kg CO₂/t
      - crystallized slag replaces granulates costing 0 kg CO₂/t => BF-slag receives 0 kg CO₂/t; pig iron is charged with 550 kg CO₂/t slag

3. **Wastes** have no upstream

   Material recuperated containing fossil carbon that is destroyed in the process are charged with their entire fossil CO₂ potential (plastics, tires)
Characteristics of the Baseline System

- A mandatory emission trading scheme for the steel sector
- Baseline is the weighted average in terms of emissions per tonne of production of the total sector (performance of overall output vs. individual activity)
- System includes all emissions, both direct and indirect
  - The baseline can serve as the basis for the allocation of allowances
  - The evolution of the baseline could also be targeted
- Performance of each operator is compared against the baseline
  - As long as they perform worse than the baseline operators must pay for allocations traded from operators performing better than the baseline
- Offers a clear incentive to invest in improvements
  - Operators receive a clear and understandable signal on the direction to follow
- Provides a big incentive for innovation
- Linking with existing trading systems could greatly simplify implementation & enhance efficiency
Conclusions

- Steel industry developed a proposal in great detail which is workable and has great potential.

- It is encouraging that sectoral approaches have become part of the debate now:
  - It is generally recognized now that global commodities need an adapted approach.

- Developing countries seem open to the approach: no limit to growth – positive incentive for good performance:
  - It will take an international leader to get developing countries onboard.

- Baseline system could be linked to systems with an absolute Cap if a solution is found for changes in activity & indirect/direct.
Thank you for your attention