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7th Annual Workshop on Greenhouse Gas Emission Trading

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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 $\Rightarrow$ 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 $\Rightarrow$ Growth to be covered by primary production emitting 2-4 t CO₂/t
- Steel accounts for ~ 6% of World CO₂ emissions



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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



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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 (?) > x100 M€ per route
- Solutions will be (?) > 50 €/t more expensive than today – How to finance?

Problems with Absolute Caps on CO₂



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- **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 3rd countries therefore **unlikely to be globalised**

Going Global – Sectoral Approach

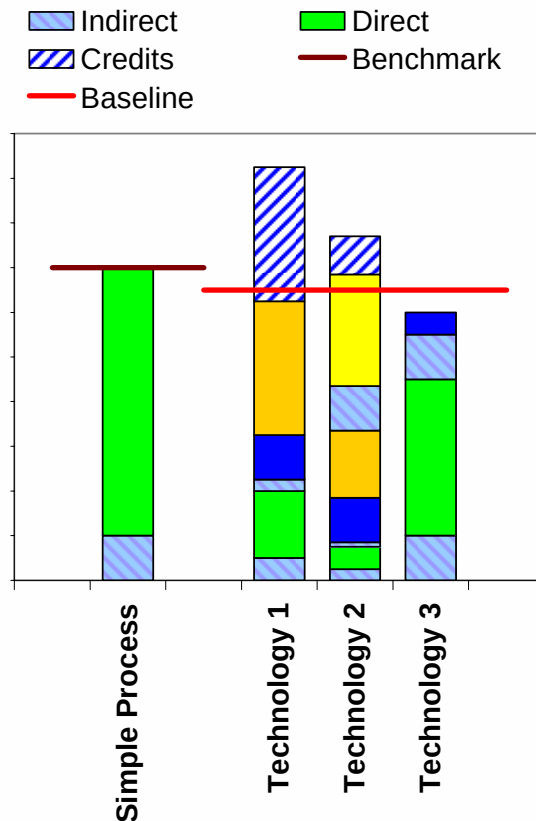


- Industry was asked to think about a sector wide approach to help reduce the CO₂ problem in a cost effective way
- EU steel industry worked three years to develop a proposal supported by all steel makers
- Basis of every policy is a tool to compare and identify the most CO₂ efficient ways of making steel
 - Complexity of steel production routes sets a challenge
 - A sensible approach needs to address:
 - CO₂ not Energy – CO₂ 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



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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



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- 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

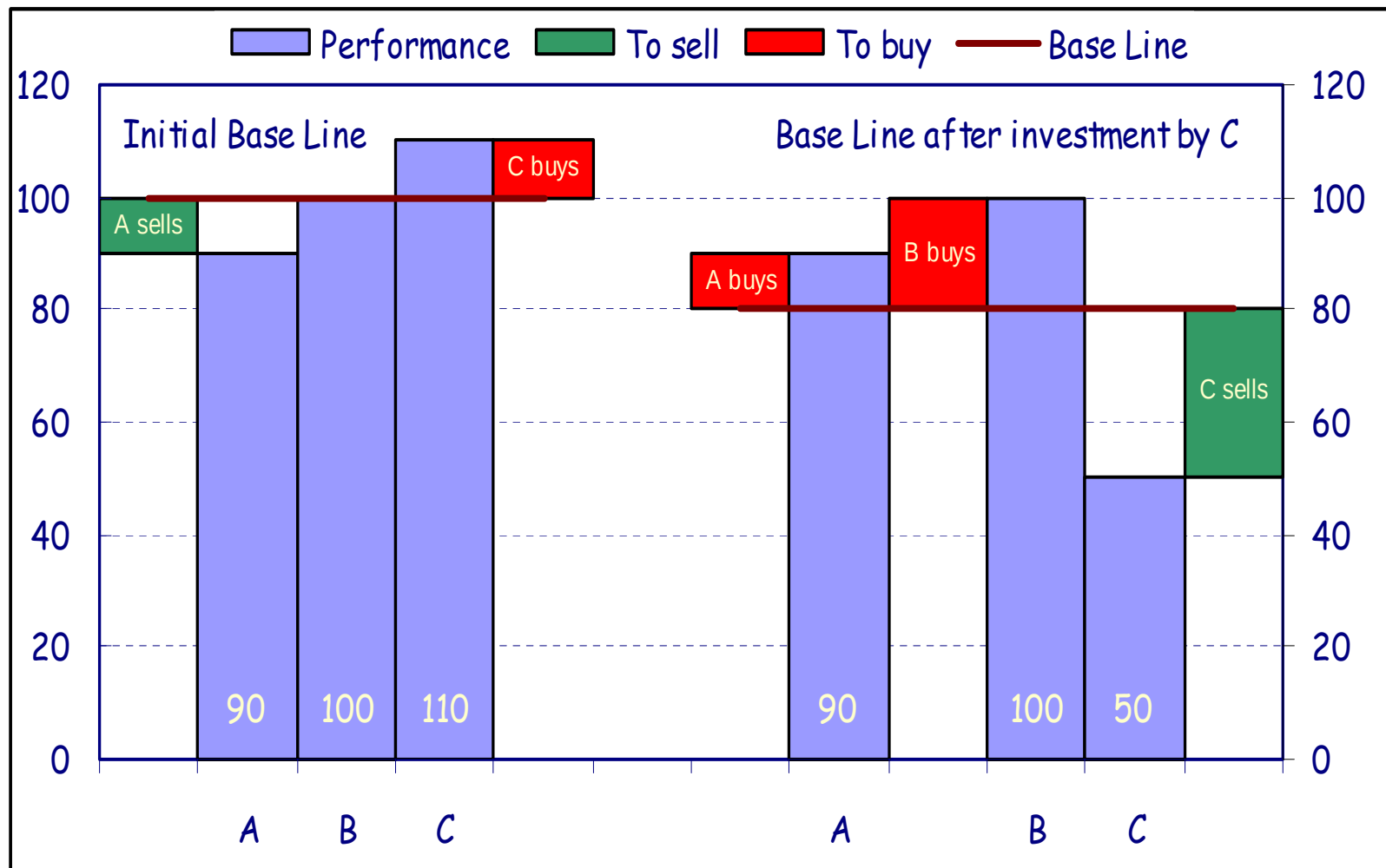
Material recuperated containing fossil carbon that is destroyed in the process are charged with their entire fossil CO₂ potential (plastics, tires)

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

Baseline System: Functioning





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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



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