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Basic materials in a LCS-transition

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ENVIRONMENTAL AND ENERGY SYSTEMS STUDIES

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Basic Materials – Key considerations for climate policy

- I. **Basic materials are essential** and global demand is growing
- II. **15 to 30% reduction possible with BAT:s**; >50% requires "breakthrough technologies"
- III. **Basic materials are energy and carbon intensive**; some unique with process emissions (30 to 50 %)
- IV. **Basic materials are increasingly traded globally** but to various extents !



Basic materials - Technical options for decarbonization

Technical options include:

- I. CCS
- II. Bioenergy
- III. Electrification

A different transition challenge:

- I. Scale and investment cycles (~1 billion USD investments, >20 to 40 yrs inv.cycles)
- II. Co-evolution of economy, industry and energy systems (systemic)
- III. Incumbents and regime transitions
- IV. Low carbon materials more costly with few co-benefits



Basic materials – Economics and costs

Mitigation costs for attaining "zero emissions" are uncertain and high (>150USD/ton)

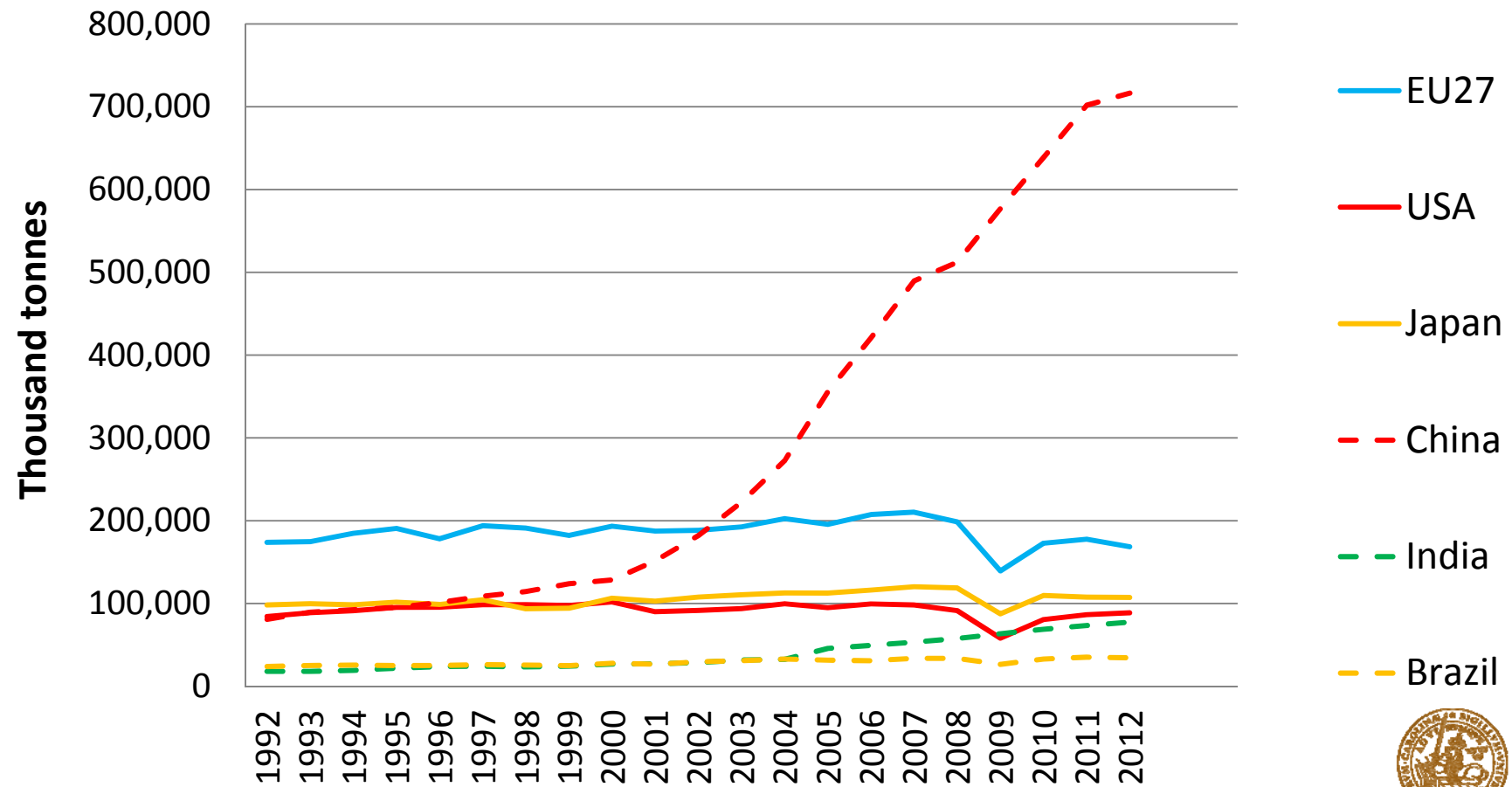
A cost of **100 USD/ton CO₂** equals:

- 4 % of selling price for high strength steel
- 30% for bulk steel
- 100% for cement
- Willingness to pay for bioenergy becomes 3 times higher than for pulpwood

EI share of GDP relatively small in developed economies (2 % in the EU) and the cost for basic materials in finished products is small



Production of steel

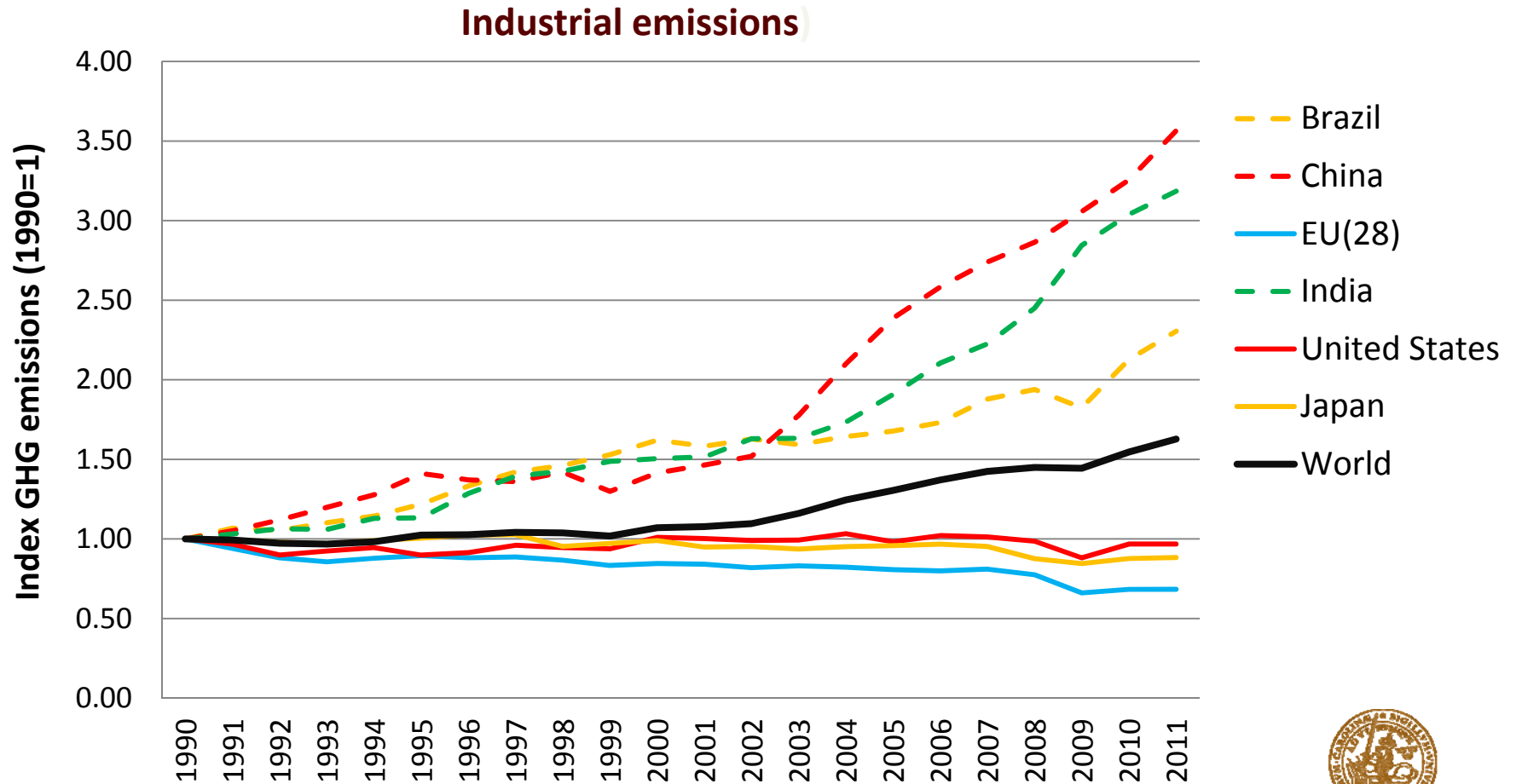


Source: World Steel



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The effects of climate policy so far...



Source: Adapted from : WRI, CAIT 2.0. 2014. Climate Analysis Indicators Tool: WRI's Climate Data Explorer. Washington, DC: World Resources Institute. Available at: <http://cait2.wri.org>



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Global climate policy and basic materials

The innovation challenge:

- Time-scales ; 2050 is "not distant future" for the EII if radical change needed
- Investment and risk management (expectations on future CO₂-price not sufficient)
- Low carbon materials more costly and with few co-benefits

Emerging conflicts: UNFCCC and CBDR (art.3)

- Interpretation in the future ?
- Carbon leakage and trade measures ?
- Industrial policy and future location of EII ?

A strategy for low carbon basic materials ?

Responsibility and right to develop a sustainable supply of low carbon basic materials

Tailored strategies to different basic materials needed

R&DD + subsidizing/securing early markets for low carbon basic materials needed

- Which role can consumption oriented policies play ?
- Domestic subsidies and industrial policy ?
- Carbon border adjustments & trade related responses ?
- G8 co-operation on this in the UNFCCC ?



El Houraria, Tunisie, Photo. Max Åhman

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The road to Paris?

