Carbon-related Border Tax Adjustments

Work at OECD

Comments at

BROOKINGS CLIMATE CHANGE, TRADE AND INVESTMENT CONFERENCE

Washington D.C., 9 June 2008

By

Nils Axel Braathen

OECD, Environment Directorate

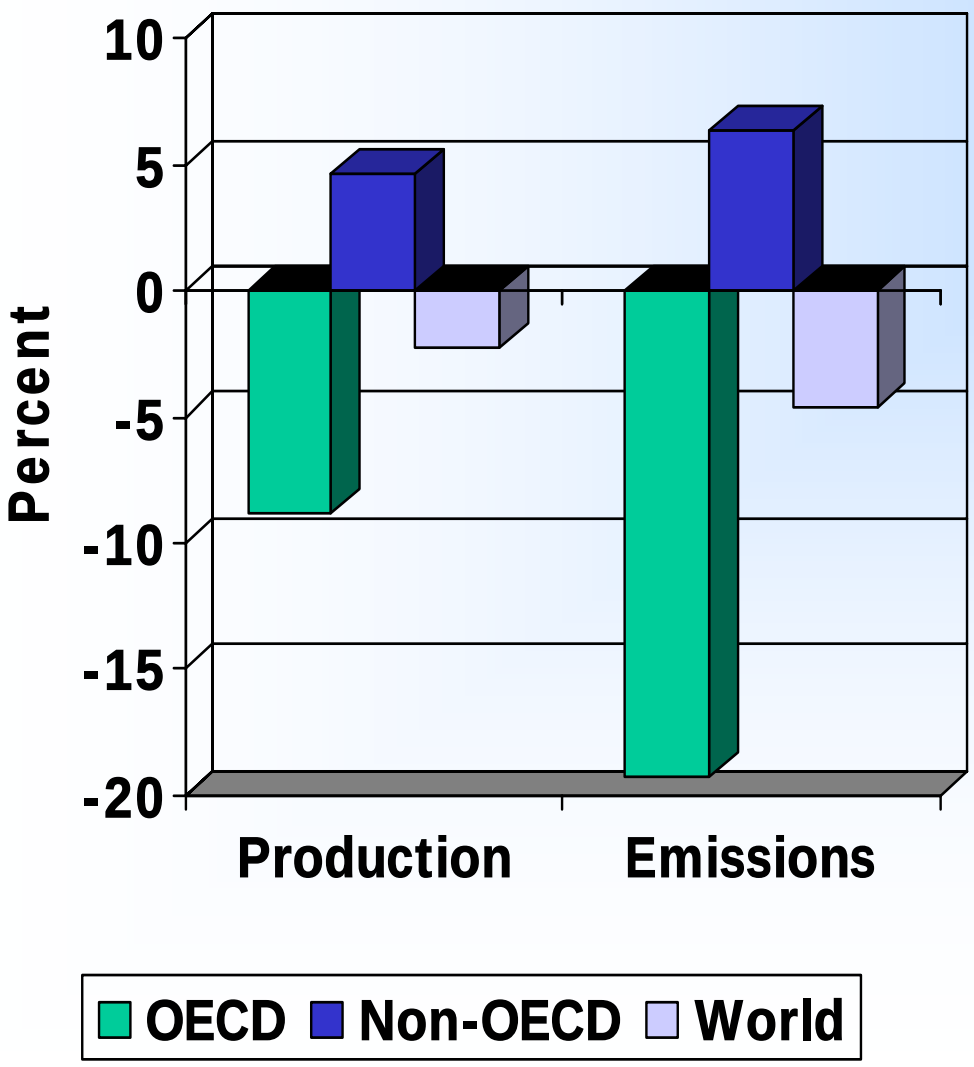
Outline

- Steel case study (Comments just on a few of the slides)
- (Cement case study)
- General equilibrium simulations
- BTA and WTO
- Main messages
- A few questions on the paper

Steel case study

- Used a partial general equilibrium model to analyse impacts of a tax of 25 USD per tonne CO_2 – applied in all OECD countries.
- The tax was levied on the steel sector and on the production of electricity used in the steel sector.
- Distinguished between Basic Oxygen Furnaces and standard Electric Arc Furnaces.
- The impacts were estimated within a short- to medium-term time frame – too short for any expansions in production capacities in response to policy shocks to be made.
- Much has changed within the steel sector since these simulations were made – consider only the qualitative findings; not the absolute magnitudes.
- http://www.oecd.org/dataoecd/58/20/33709359.pdf

Impacts of an OECD wide tax



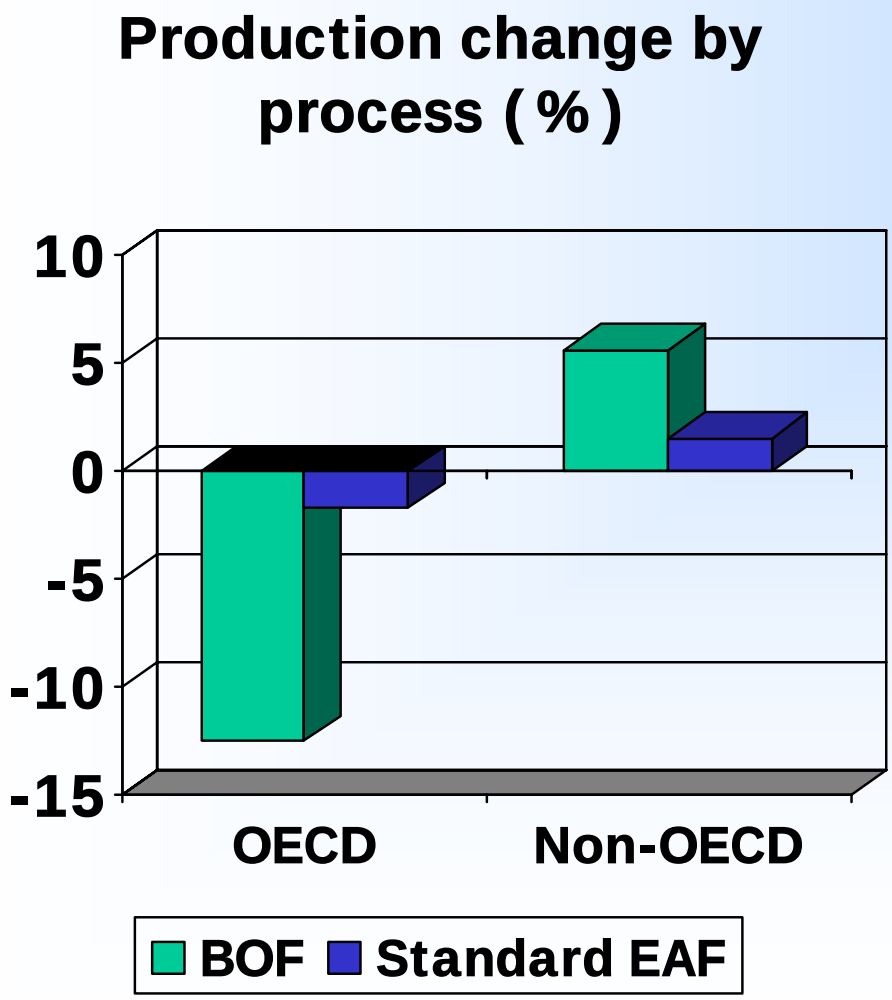
Production:

- OECD steel production declines.
- Partly offset by increased production in Non-OECD.

Emissions:

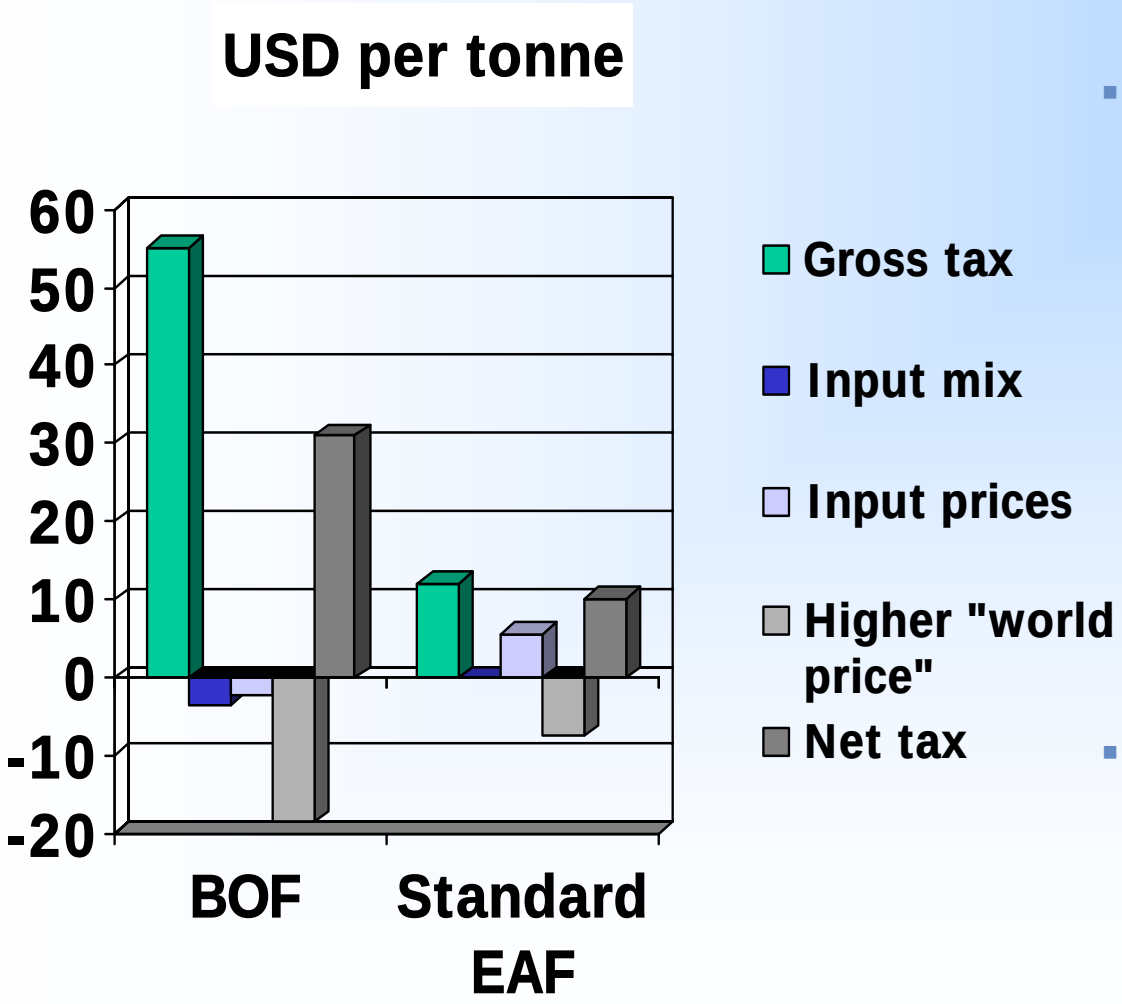
- Stronger impact on emissions than on production; cleaner in OECD, dirtier in Non-OECD.
- World emission reduction is significant (twice the decline in global production level).

Behind the figures: Substitution



- Substitution away from emission-intensive inputs and processes in OECD:
  - From ore/coal to scrap in BOF steelmaking.
  - From BOF to EAF steelmaking.
- Higher scrap prices dampen the degree of restructuring – as EAF use much more scrap than BOF.

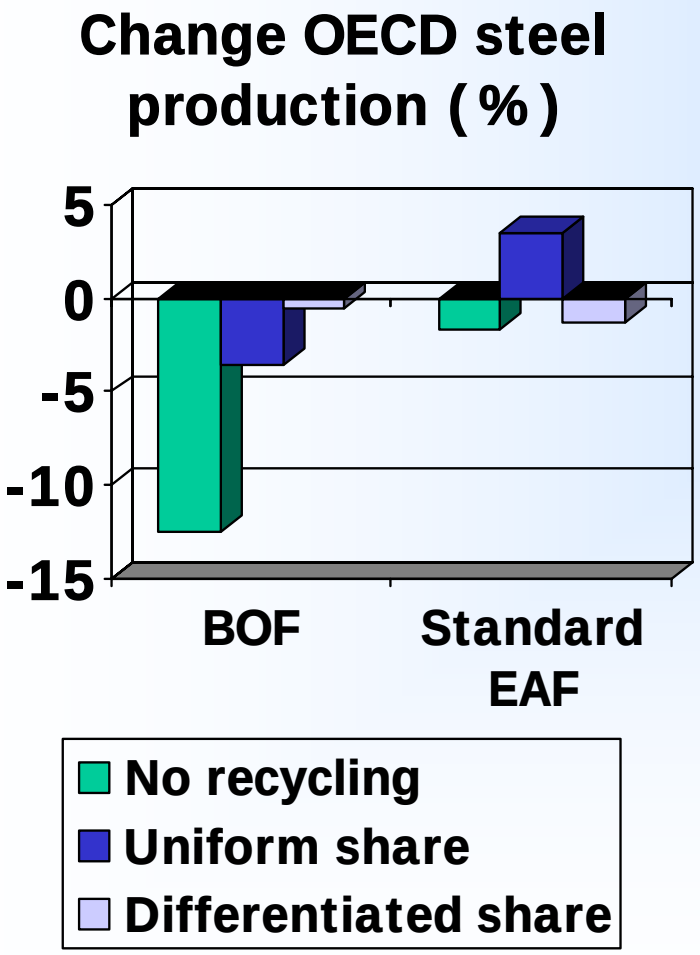
Behind the figures: Tax incidence



- The difference in net tax between BOF and EAF is surprisingly small, due to:
  - Less input substitution in EAF steel.
  - Higher input prices for EAF steel.
  - EAF steel production is more price elastic.
- Part of the net tax is borne by steel users, through higher steel prices.

Recycling of tax revenues back to the steel sector

(or distribution of free emission permits)



Policy:

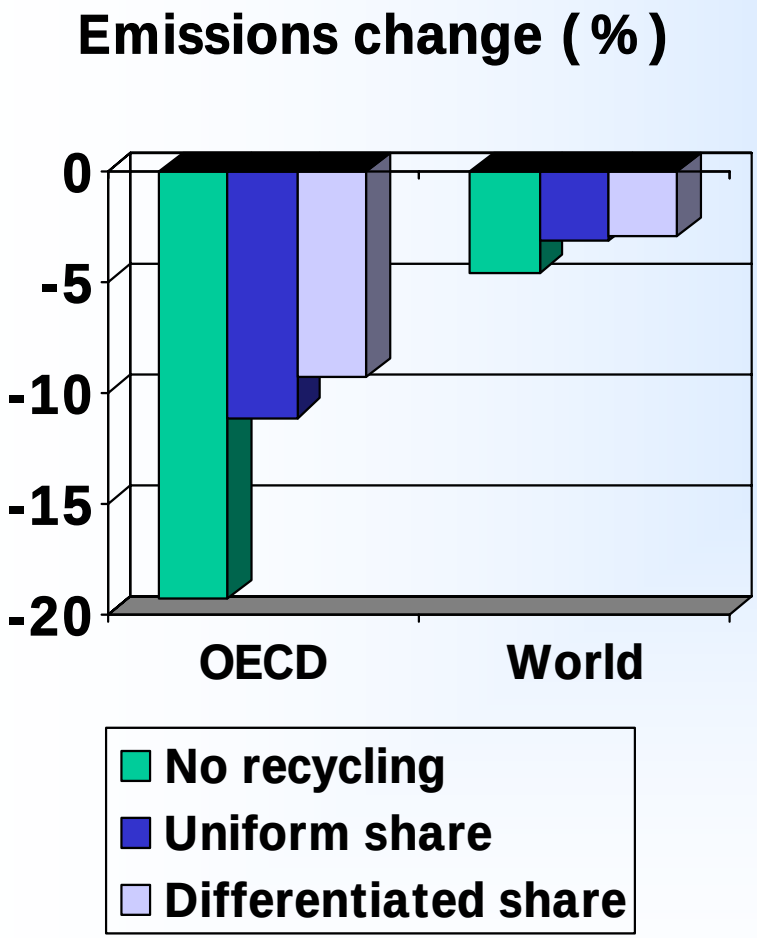
An OECD-wide tax of 25 USD per tonne CO_2 combined with a 100% refund, allocated based on actual output

- Uniformly across steel producers
- Differentiated between steel technologies

Results:

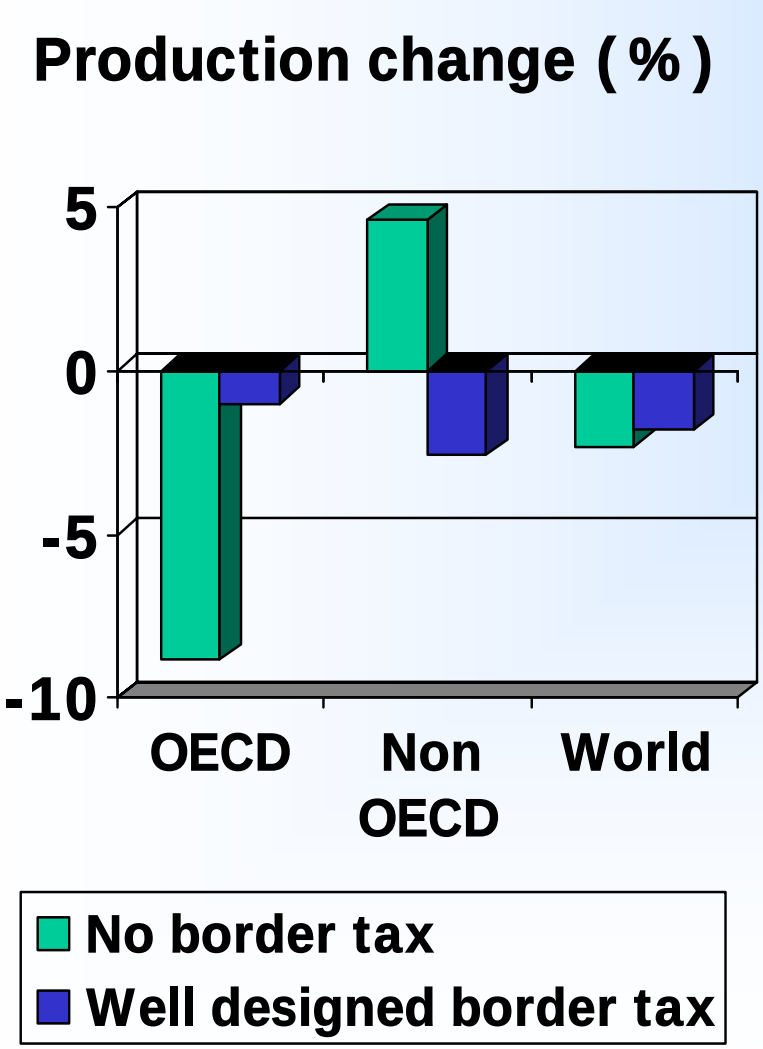
1. BOF production: Recycling has a big, positive impact.
2. EAF production: No impact with differentiated share (output subsidy outweighed by higher scrap prices).
3. Uniform allocation induces strong restructuring towards cleaner technologies.

Revenue recycling: effects on emissions



- Without any revenue recycling, an OECD-wide tax would reduce OECD emissions from the sector by some 19% and global emissions from the sector by 4.6%.
- Revenue recycling reduces the global abatement significantly – to about 3%.
- Uniform allocation is better for the environment than differentiated schemes – as it favours EAF production.

Border tax adjustments: Production effects



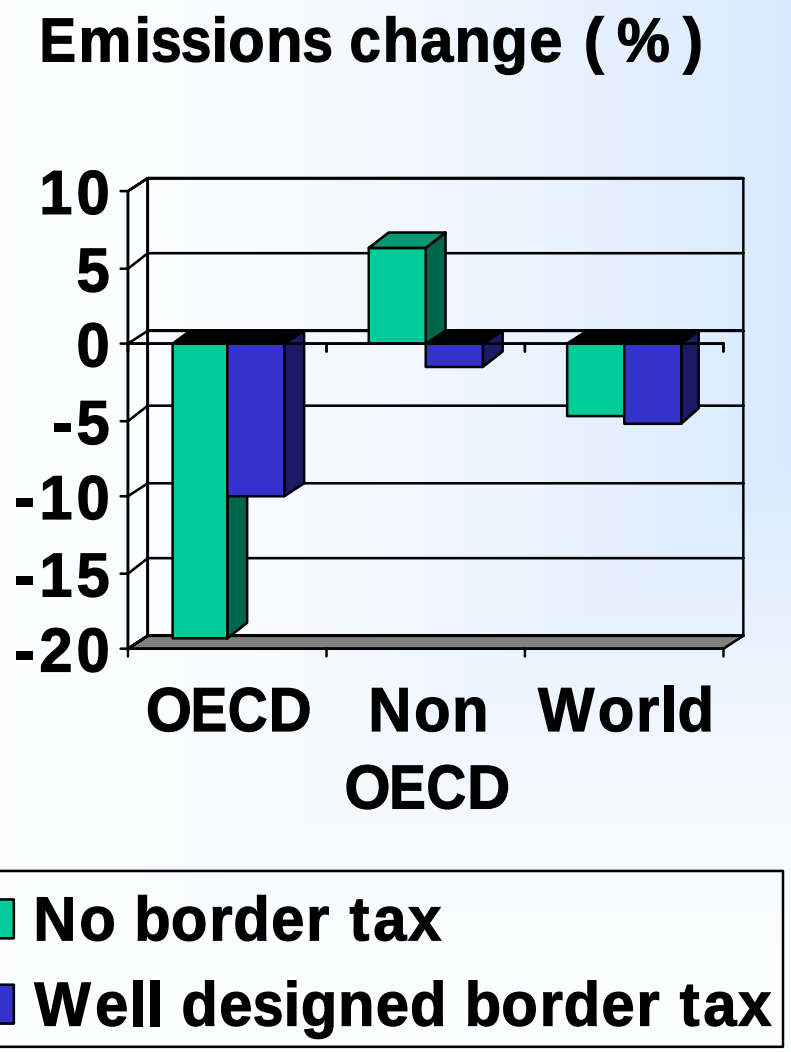
Policy:

An OECD-wide tax of 25 USD per tonne CO_2 combined with import taxes plus export subsidies based on Non-OECD emission levels (difficult to implement!):

Results:

1. Much smaller reduction in OECD production level.
2. Non-OECD production declines as well!
3. Small impact on global steel production.

Border tax adjustments: emission effects



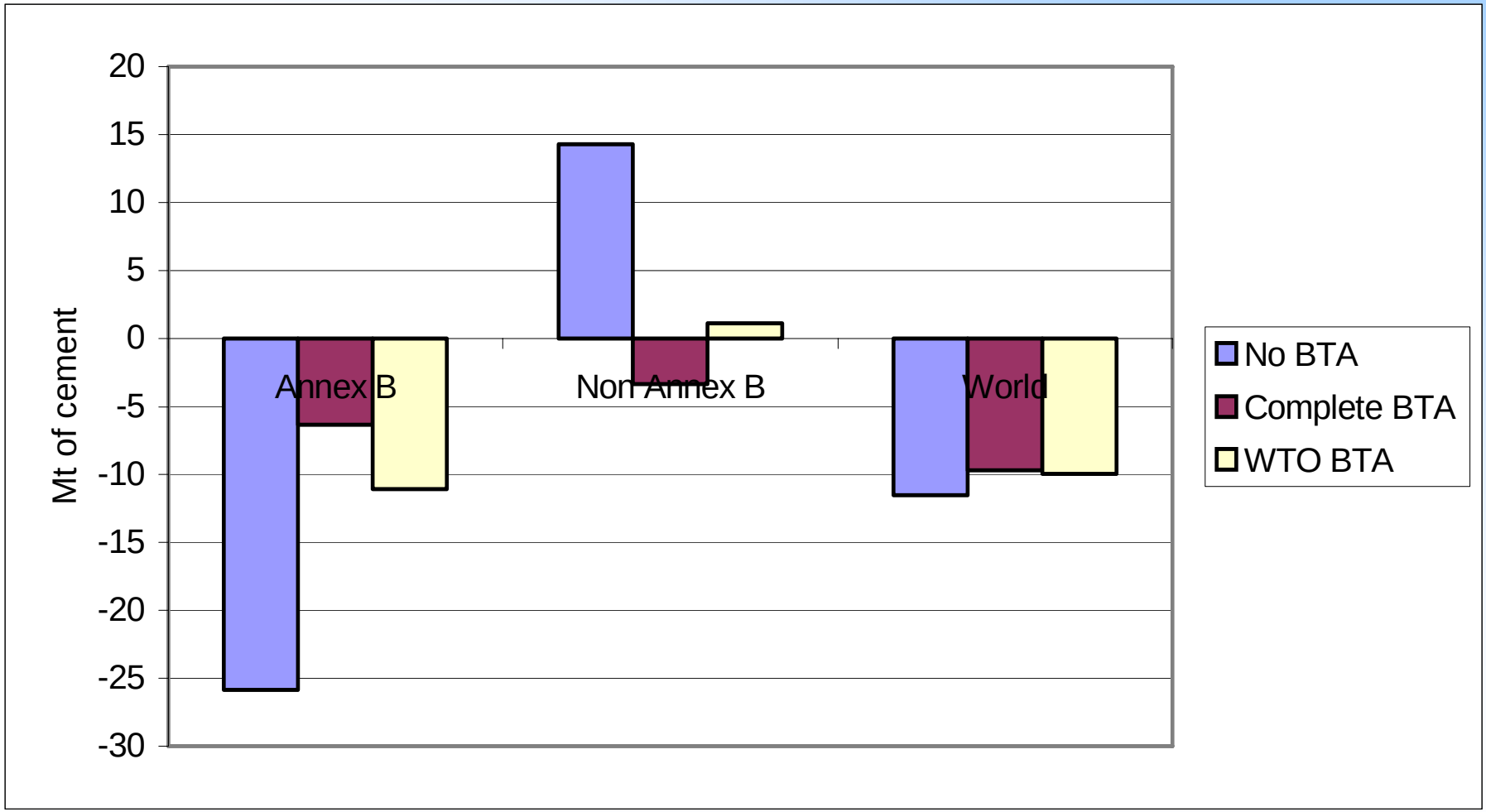
- Global emissions decline more than without border taxes (despite substantially higher OECD production).
  - Due to significant abatement in OECD (substitution towards cleaner inputs and technologies).
  - Carbon leakage is eliminated.
- "Ideal" border taxes seem better for the environment than revenue recycling – as the recycling provide output subsidies.

Cement case study

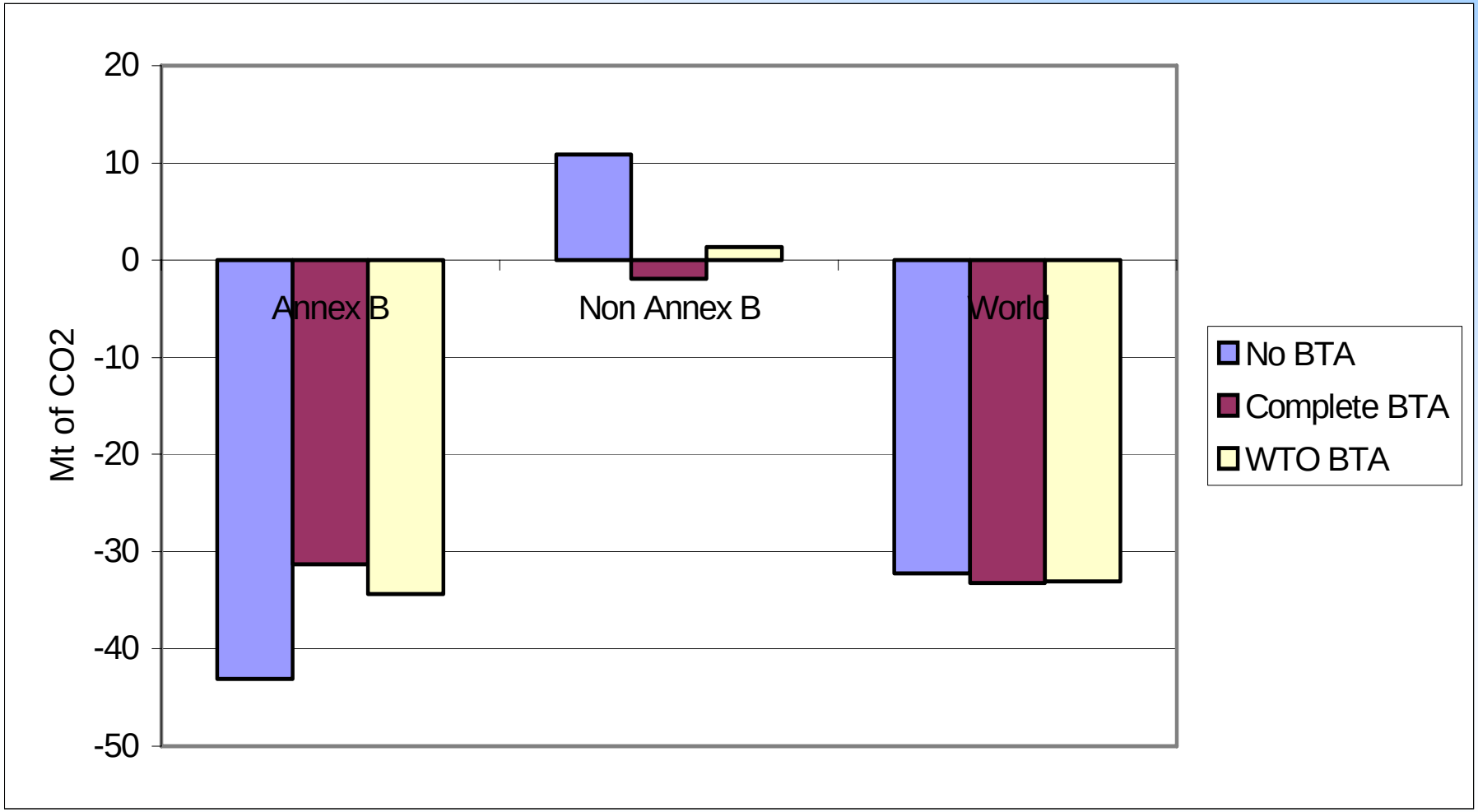
- Simulated a CO_2 tax or an Emission Trading Scheme with auctioned allowances implemented in the Kyoto Protocol Annex B countries that have ratified it, assuming a CO_2 price of 15 euros per tonne.
- This was combined with two BTA versions:
  - In the “Complete BTA” scenario, exported production was completely exempted from the climate policy and imports of cement from the rest of the world were taxed in accordance with the CO_2 intensity of the cement production in the exporting country.
  - In the “WTO BTA” scenario, exports benefit from a rebate corresponding only to the least CO_2 intensive technology available at a large scale, and imports are taxed to the same level.

http://appli1.oecd.org/olis/2004doc.nsf/linkto/com-env-epoc-ctpa-cfa(2004)68-final

Production in 2010 compared to BaU



CO_2 emissions in 2010 compared to BaU



General equilibrium simulations I

- The simulations above have been *partial equilibrium* simulations – looking at options to limit any negative impacts of non-global carbon policies on the competitiveness of single sectors.
- OECD is currently doing simulations of the impacts of BTAs using a *general equilibrium* model (ENV Linkages).
- Three main sources of leakage related to a non-global carbon policy:
  - Though impacts on the competitiveness of energy-intensive sectors
  - Through fossil fuel markets: Lower demand for fossil fuels in the "coalition" would lead to lower fuel prices – and higher fuel demand – outside the "coalition".
  - Through foreign direct investments **(Not covered in ENV Linkages)**
- **Very preliminary** findings indicate that the most important leakage *normally* would stem from the *fossil fuel markets*.

General equilibrium simulations II

- But the amount and sources of leakage, and the impacts of BTAs, would depend on the *size of the "carbon coalition"*.
  - With few participants (*e.g.* EU alone), total leakage would be important, the competitiveness component would dominate, and BTAs could have relatively strong impacts (both in terms of emissions and cost increases).
  - For a broader coalition (*e.g.* all of Annex I), total leakage would be less important, but it would be dominated by the impacts through the fossil fuel markets – and BTAs would have small effect.
- The estimated leakage also depends on *the number of GHGs covered* in the analysis.
  - Leakage is lower when non-CO_2 GHGs are included in the analysis – until the low-cost abatement options for the other gases have been exhausted.

BTA and WTO

- A chapter in our 2006 publication *The Political Economy of Environmentally Related Taxes* looked at BTAs in relation to WTO rules.
- A description – not an "OECD interpretation" of WTO's rules.
- Addressed *inter alia* the BTA provisions in the US Superfund and ODS taxes, which have been accepted.
- The chapter concluded that *only a WTO panel could decide* on whether any concrete application of BTAs in a carbon context would comply with WTO's rules.

Main messages

- BTAs have *in theory* the potential to limit negative impacts on *sectoral competitiveness* of ambitious GHG policies
- However, in a general equilibrium setting, the carbon leakage related to the competitiveness of individual sectors can be relatively unimportant – leakage through fossil fuel markets would normally matter much more.
- Hence, BTAs should be considered as *a last resort*.
- The focus should instead be firmly fixed on *achieving an ambitious international approach*, with *participation by all the major emitting countries* and sectors.
- If BTAs one day should be considered further, a major problem would be their *administrative costs*.
- There is also a real danger that BTAs would trigger tip-for-tat *retaliations*.
- We need to look for environment **and** trade policy options; not environment **or** trade. BTAs could take us in the wrong direction.

A few questions on McKibbin & Wilcoxen's paper

- Which were the oil price assumptions in the baseline?
- Which were the impacts of the scenarios on oil price?
- Which shares of the leakage in the policy scenarios stemmed from:
  - The fossil fuel markets
  - Changes in competitiveness of energy-intensive sectors
  - Foreign direct investments
- Which greenhouse gases were included?
- Why is there 0 impact of an uncompensated US tax on carbon emissions in China and India?