Ex-post evaluation of the effects of the EU ETS on specific industrial sectors

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Outline

- Snapshot of heavy industry developments 1981-2005
- Evaluating the effects of the EU-ETS Phase I:
  - Methodology
  - Industry sectors
- Preliminary assessment
- Conclusion and policy messages

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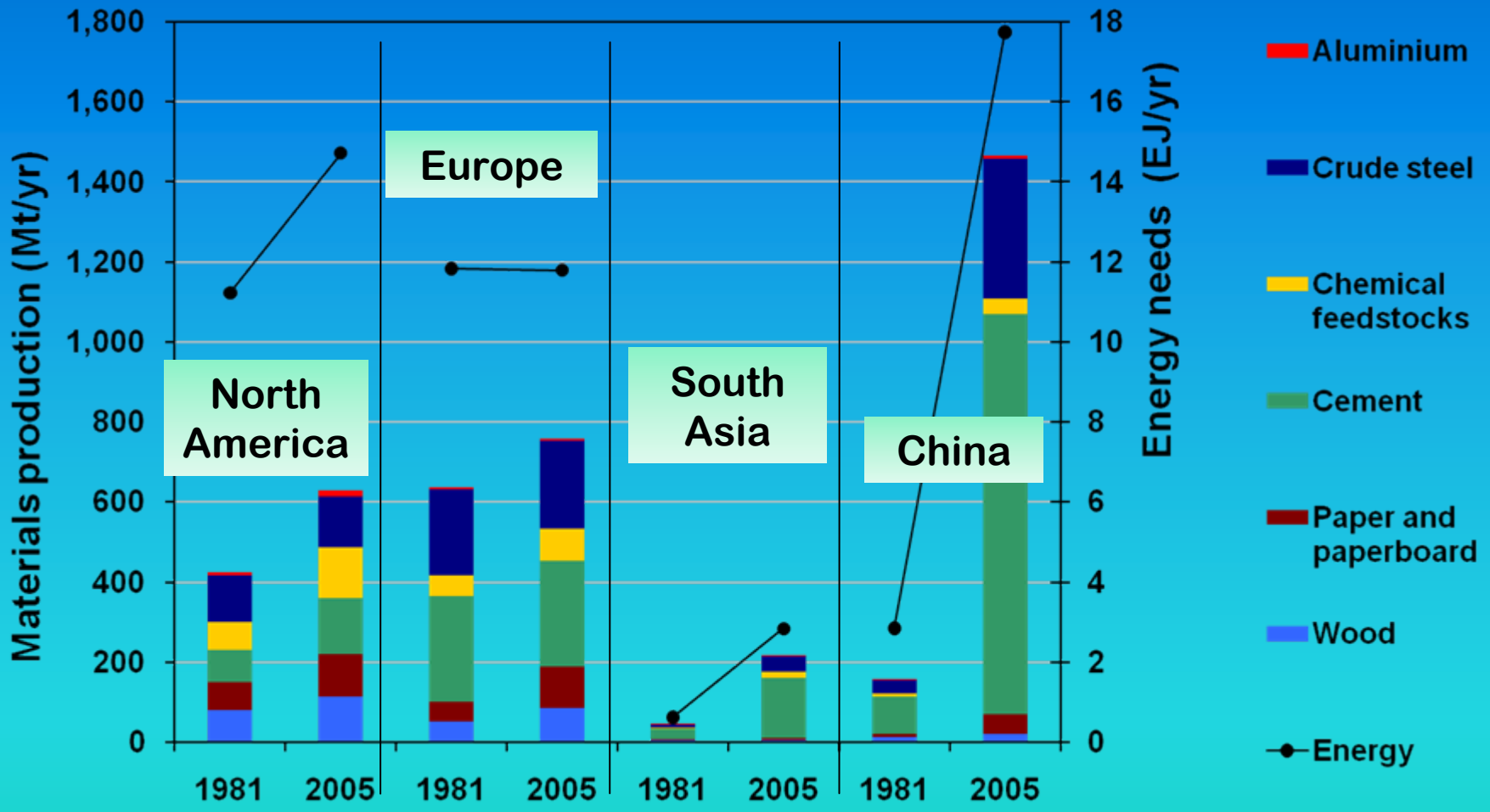
Industrial output growth: 1981-2005
Main products / world regions



➔ A reality: most of the growth in energy-intensive industries has been and will be outside Europe (e.g. local infrastructure needs, cheaper energy or raw materials)

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Source: IEA, 2007, *Energy use in the new millennium*.

How significant is carbon leakage?

Ex ante simulations

- Carbon leakage rates vary
  - Iron and steel:
    - 55% @ USD21/tCO_2 tax in Japan and the EU-15
    - From 0.5% to 25% @ EUR20/tCO_2 price EU-27
  - Cement: between 40-70% @ EUR20/tCO_2 price EU-27
- Methodological uncertainties abound
- CO_2 prices are not reflective of future CO_2 targets

Ex post assessments

- Monitoring costs and price changes
- Monitoring trade flows and investment decisions

→ Measurable impact of CO_2 cost?

Sources: *Gielen et al 2002, Demailly et al 2006 and 2008, Ponssard et al 2008, Reinaud (forthcoming), Reinaud and Quirion (forthcoming), Lacombe 2008, Walker and Quirion (forthcoming)*

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Any evidence of leakage in aluminium? (2005-2007)

- **Effects on trade flows?**
  - No statistical impact of CO_2 cost … but:
  - Most smelters under long-term electricity contracts – limited exposure to wholesale price increases
  - Booming international aluminium market – reopening of a smelter in Germany, still profitable in spite of higher electricity prices

- **Today's situation probably a poor indicator of tomorrow's**
  - Termination of long-term electricity contracts
    - New contractual arrangements: how important will CO_2 cost be?
  - Possible inclusion of aluminium emissions in EU ETS

Source: Reinaud, forthcoming

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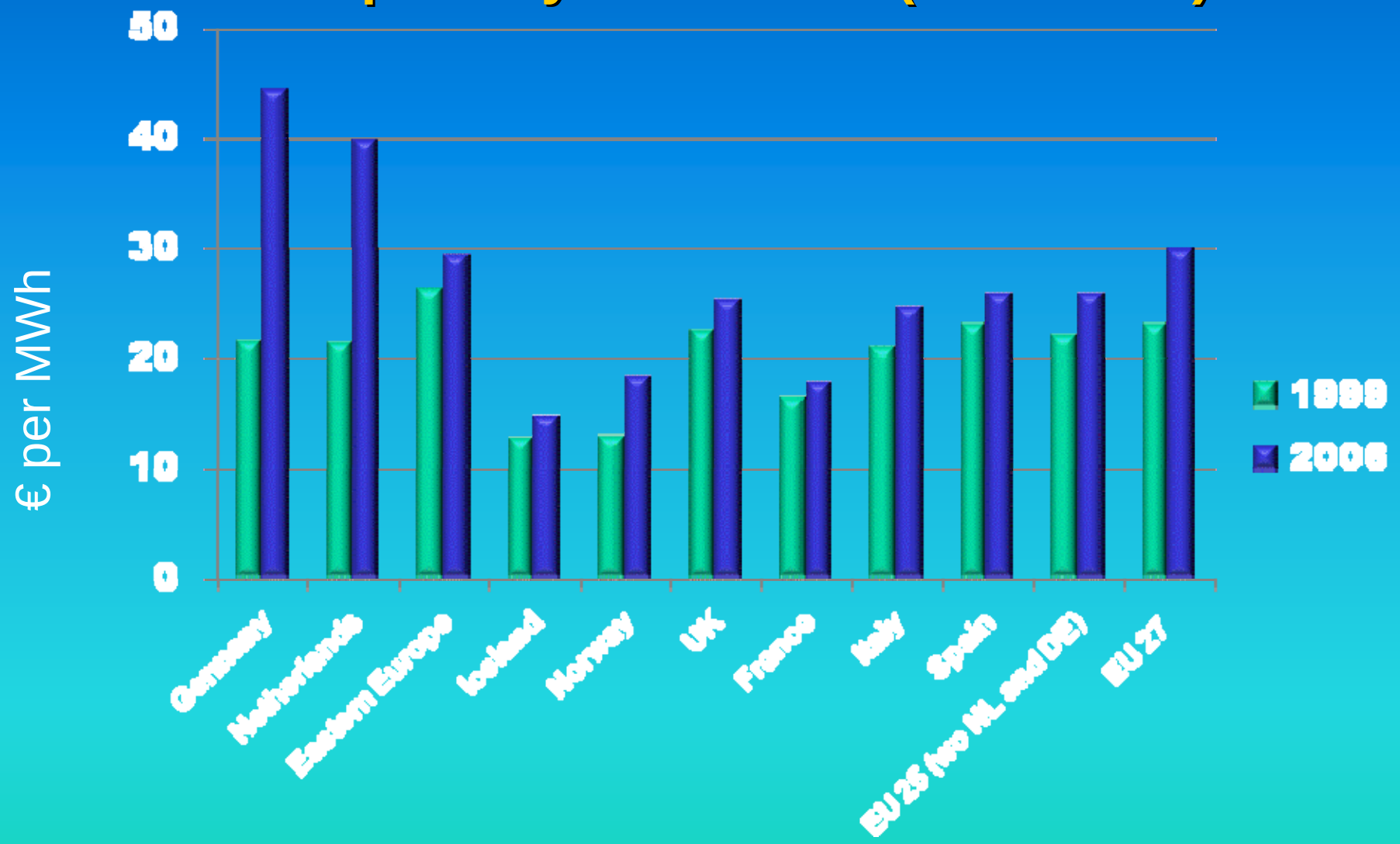
Estimated electricity cost variations in primary aluminium (1999-2006)



How much of the increase is linked to CO_2 vs interruption of long-term contracts?

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Source: Reinaud (2008), based on CRU and EAA www.crugroup.com

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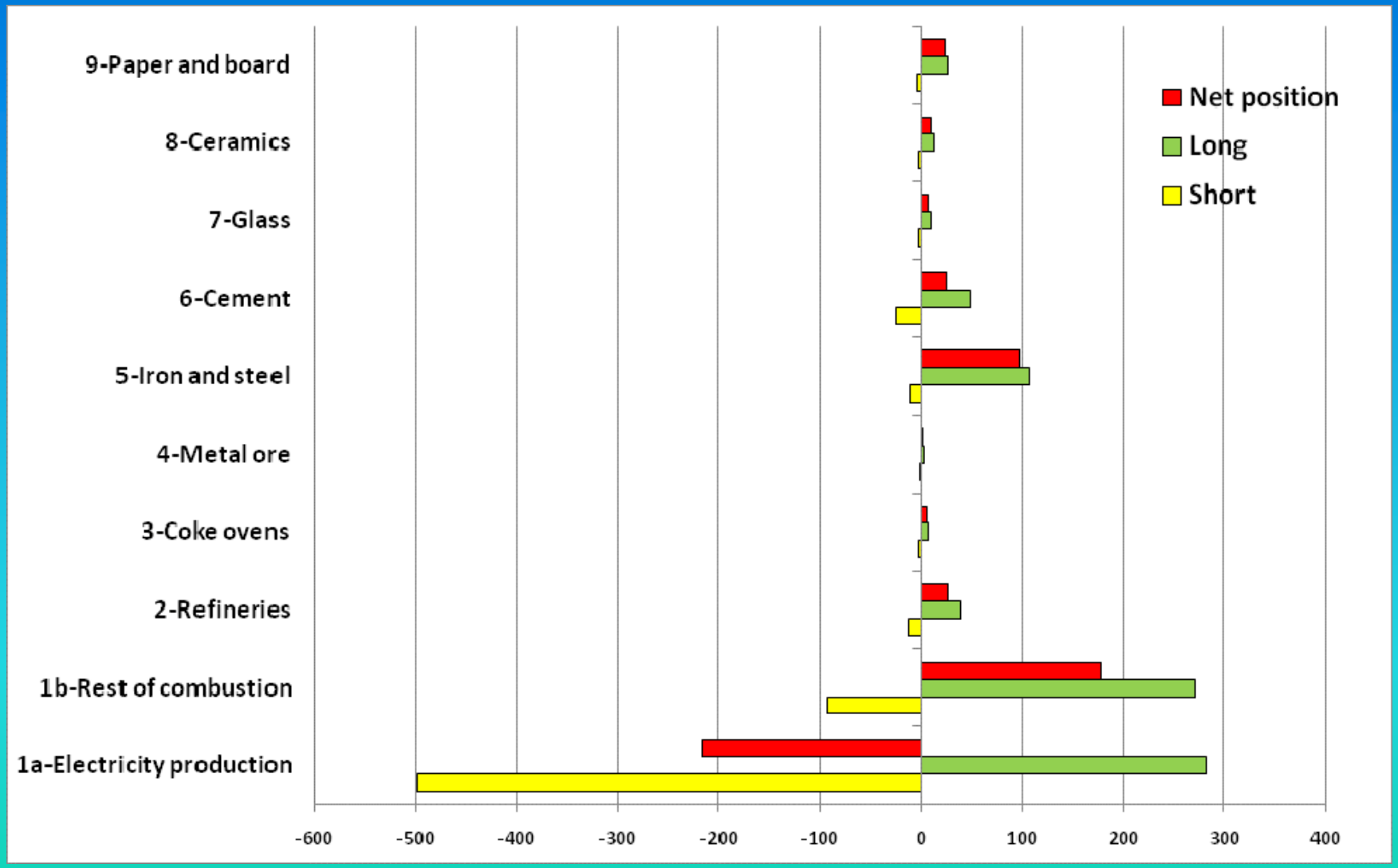
Short and long positions by sector, EU25, 2005-2007



Source: Mission Climat et al. (2008) sourcing the CITL database

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Other sector: ex-post impact assessment

- Steel (IEA and CIRED)
  - Largely over-allocated EUAs (+17.5%): EUA as a new cost factor?
  - Change in trade flows driven by consumption increase
- Cement (UCD and CIRED)
  - Little change in market prices yet small evidence of price increase (Ponssard and Walker 2008)
  - Limited evidence of change in trade flows
    - Growth of imports limited in comparison to 1997-2002 growth
    - Consumption is the driving factor for imports (France is an exception)
- Refinery sector (MIT) Lacombe (2008):
  - No structural change in trade flows
  - Surplus of allowances
  - If impacts, high margins – difficult to "see"

Trade flows

Profits

Investments

Time dimension is of critical importance

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Summary of the preliminary assessment

- No statistical evidence of a change coinciding with the introduction of the EU ETS
- Great differences btw sectors …
  - Trade intensity
  - EU-ETS costs: emissions intensive vs. electricity intensive sectors
  - Allocation
- … but some common features across these activities
  - High price environment for industrial commodities
- Yet, Phase 1 is a poor indicator of what may come
  - More stringent targets (i.e. higher CO_2 prices)
  - Not enough time to see investment decisions change

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Concluding remarks

- How significant could the carbon leakage problem be?
  - **Do not speculate: simulate and <u>monitor</u> expected effects**
    - Short term = **changes in international trade flows**
    - Long run = **changes in investments patterns**

- **Yet drivers of investment are multiple**
  - **EU sectors are not operating in a vacuum**

➔ **Policy / modelling challenge:** properly defining the **counterfactual scenario** is critical for finding evidence of leakage

- Ambitious climate policy implies changing relative competitiveness of sectors, encouraging low-carbon innovations and preparing for new playing field

➔ **Policy challenge:** Balance prime mover advantage with risk of carbon leakage

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Reinaud J. (Nov 2008)
Issues behind Competitiveness and Carbon Leakage

Thank you

further questions?

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Compensating for increases in electricity costs?

- Having a clear idea of the role CO_2 prices play in electricity contracts: critical before considering compensating for increases in indirect CO_2 costs

- **Regional features of European electricity markets**:
  - Annual supply contracts (ex. Italy and France)
  - Electricity purchased on the market every quarter trimester, or calendar year (ex. Scandinavia)
  - Regulated prices (ex. Spain)
  - Autogeneration (in all sectors)

  ➔ Electricity price increases do not necessarily translate into electricity cost increase

For more information see Reinaud (2007)

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Key Policy Messages

5 challenges for measures to address CL

1. The debate on CL = a second best policy option!
2. Need to **maintain a carbon price** signal in the economy
3. Aim to provide a clear **long-term signal for R&D** in covered sectors
4. Consider designing measures as **flexibly** as possible to avoid the lock-in of less efficient policies and commit to on-going assistance (int'l negotiations)
5. Need to be **transitional** in the case gvts decide on the usage of measures w/o sufficient empirical analysis on carbon leakage expected from a sector

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