

Energy Prices, Energy Cost & Industrial Competitiveness:

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Brussels, 13 June 2014

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Agenda

1. From Energy Prices to Competitiveness
– a framework for a fact-based process
2. Energy Prices – Composition and Data
3. Energy Cost in the Industry – Existing Approaches
4. Industrial Competitiveness – Issue of Cost Pass-Through
5. Conclusions

Own work and background

- Ex post and ex ante research analyses
 - empirical analyses on a sectoral level on pass through (BERR)
 - firm based analyses based on administrative data (ENTRACTE)
 - international comparison based on WIOD
 - CGE modeling (PACE) for DG ENTR in different impact assessments (2020, 2030)
 - ETS surveys: KfW/ZEW-CO₂ Barometer
- Broad view as chair of German energy monitoring commission
 - energy prices (cost, competitiveness) comparisons as part of monitoring process of the Energiewende, fact-based approach
 - direct versus indirect effects of ETS - beyond free allocations
 - more integrated view: including also interaction of impacts of renewable policies through e.g. high feed-in tariffs or merit order effects

1. From Energy Prices to Competitiveness – a Framework

- Energy prices
 - Regional input price differences *can* cause disadvantages for industrial competitiveness
 - However: neglects other factors such as energy input volumes, substitutability etc.
- Energy cost in industrial production
 - Combining actual energy prices and energy input
 - However: neglects possible cost pass-through to customers
- Industrial competitiveness and level of competition
 - Combining actual energy cost and intensity of competition on downstream markets

2. Energy Prices and Competitiveness – Measurement

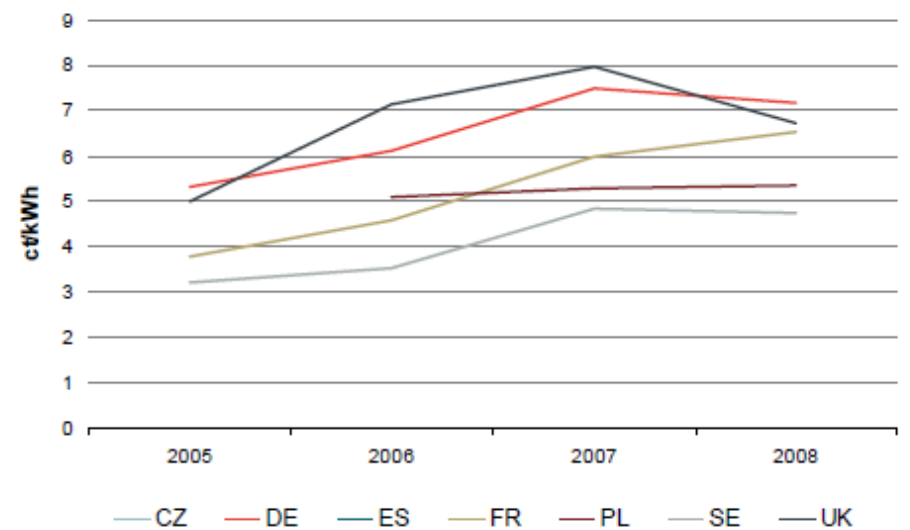
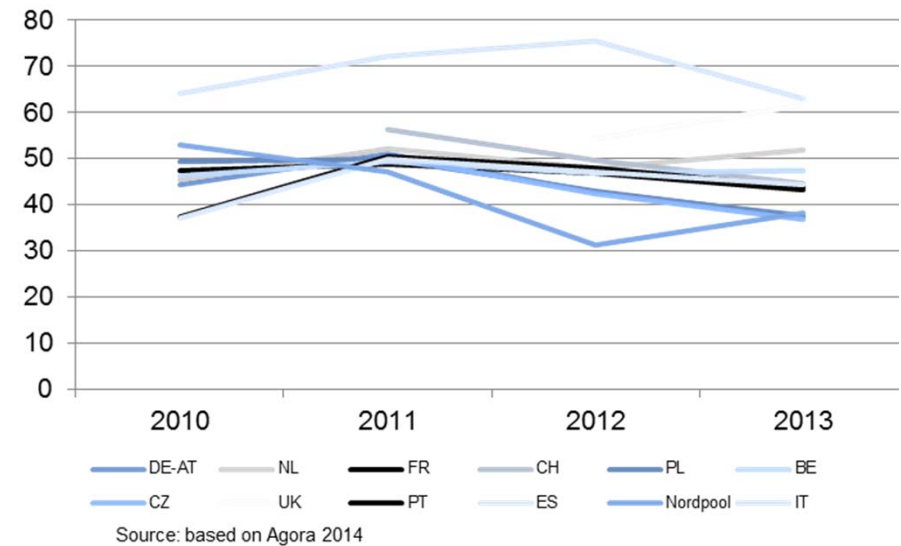
- Differences in energy prices among countries is a potential source of regional differences in industrial competitiveness

Indicator: Ideally actual prices paid for energy inputs of firms in one country should be compared to their national and/or international competitors.

If firm-level data is not available, actual prices paid for energy inputs of firms in a specific sector in one country could be compared to another country

2. Energy Prices and Competitiveness – Existing Approaches

- Comparison based on **wholesale prices** (e.g. electricity)
 - Global: data available
 - but: energy cost important
- Comparison based on **aggregated industrial end-user prices and end-user price components**
 - Europe: data from Eurostat (not specific sectors, very large consumers are underrepresented)
 - Global: data available from IEA on end-use energy prices (not internationally comparable)
- **Survey based comparisons**
 - end-user prices, sectoral
 - but: representativeness



Quelle: Frontier/EWI nach Eurostat, entsoe und Platts Power Assements Base, EEX, Nordpool

2. Energy Prices – Restrictions and Recommendations

- Wholesale prices:
 - Incomplete picture: neglects important components of end-user energy prices
- Available public price data incomplete:
 - IEA price data across countries not consistent
 - Eurostat data only for natural gas & electricity, large consumers underrepresented
 - Incomplete documentation of definition and methodology of data collection
- Survey data:
 - Low number of plants (reply is voluntarily), confidentiality concerns restrict analysis
 - One shot survey, regularly updates necessary to investigate long-term trends

Recommendations:

- Detailed specification and completion of publicly available data sets
 - Completeness (obligatory participation including energy-intensive industries)
 - Thorough checks on plausibility, methodology of data collection, harmonization
- International comparison of end-user prices on a disaggregated sector level based on administrative data

Framework for the Monitoring of Energy Prices, Cost and Competitiveness

Energy Prices

- National price development
- Comparison of price trends between relevant countries
 - EU / Non-EU
 - Relevant competitors
- Comparison of price level between relevant countries
 - EU / Non-EU
 - Relevant competitors

Energy Cost
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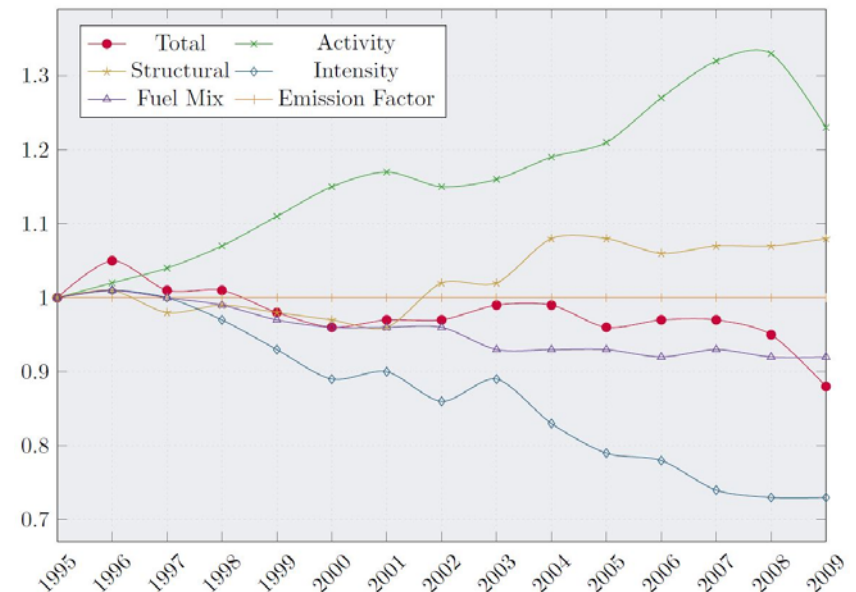
Competitiveness

3. Energy Cost and Competitiveness

- Even if sufficient price data would be available:
they do not translate 1:1 into actual energy cost of firms
 - Sufficient prices are the actual prices paid by the firm, which depend on procurement structure, exemptions from taxes and levies, and possible buyer side market power for energy inputs
- Regional differences in energy cost in one sector stem from differences in actual prices **and** energy intensity
Indicator: Energy cost incurred by firms relative to their value of output in comparison to national or international competitors

3. Energy Cost and Competitiveness – Existing Approaches

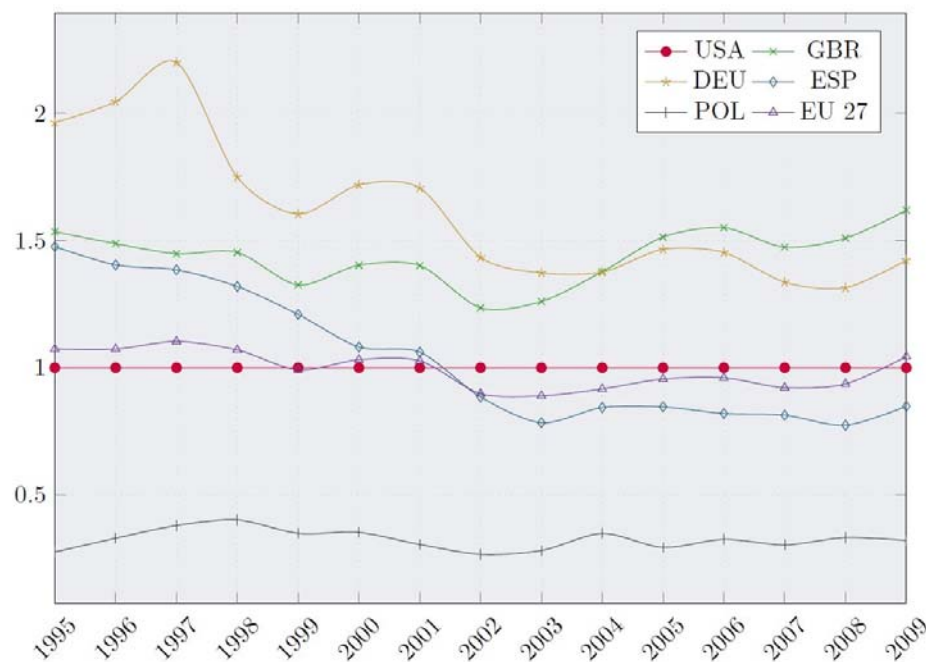
- International comparison based on share of energy cost in total production cost
 - Europe: Eurostat data from “Structural Business Statistics” (SBS) --
→ extent of impacts of energy cost developments can be assessed
- International comparison based on energy unit cost
 - Global: Data from WIOD “World Input-Output Database”
→ Comparison of level and evolution of combined energy prices and intensity across countries for a specific sector – IMPORTANCE of efficiency and innovation
 - Broader analyses of comparative advantage necessary (e.g. unit labor costs)



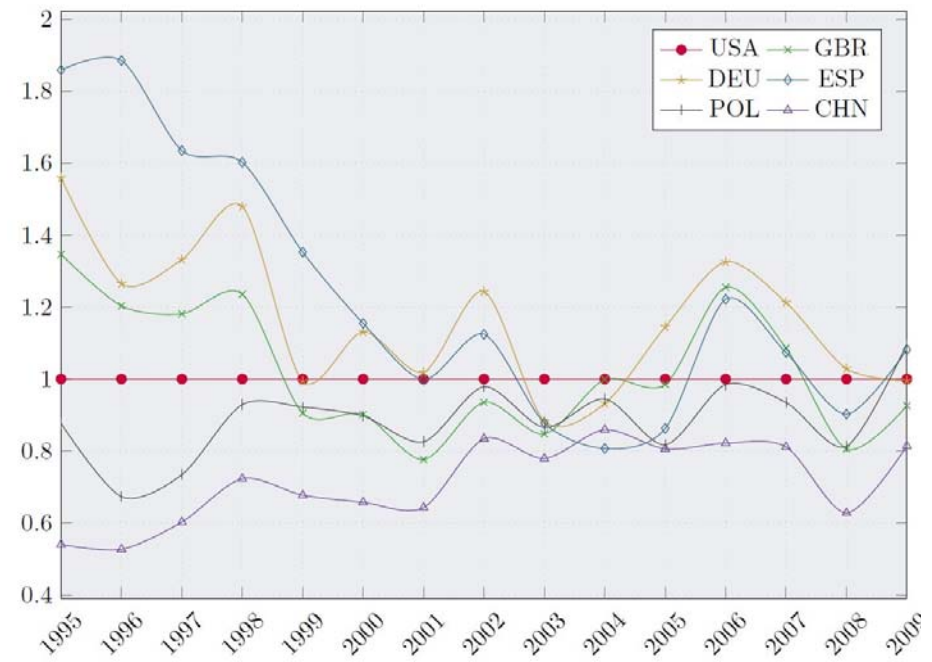
3. Energy Cost and Competitiveness – Existing Approaches

- International comparison based on energy unit cost
 - Global: Data from WIOD “World Input-Output Database” shows **sources of comparative advantage**

Per unit wage costs



Real per unit energy costs



3. Energy Cost and Competitiveness – Possible ways forward

- Develop international comparisons based on share of **energy cost in total production cost** extending SBS
- Develop **energy unit cost** (WIOD approach) further
 - High resolution of energy carriers, low resolution of energy sectors (only mining, coke & petroleum, electricity)
 - More disaggregated energy intensive sectors desirable
 - Continuation of times series on energy unit cost would be necessary
- International comparison of **energy unit cost** based on **administrative data on individual firm level**

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 - Relevant competitors
- Comparison of price trends between relevant countries
 - EU / Non-EU
 - Relevant competitors

Energy Cost

- Development of energy unit cost on firm level within a country
- Comparison of energy unit cost levels of firms between countries
- Comparison of changes in energy unit cost of firms between relevant countries

Competitiveness

?

4. Industrial Competitiveness – Issue of Cost Pass-Through

- Rising energy costs have limited impact on industrial competitiveness, if these increases can be passed on to the consumers of the final product
- Pass-through of costs depends on market conditions, competitiveness situation (market power, cost evolution at home and abroad, demand elasticity ...) etc.
- Desirable: **Share of real energy unit costs** that can **Not** be passed on
- “less-than-ideal” indicators to infer competitiveness of final product market
 - trade intensity of the industrial sector (share of imports and exports)
 - concentration rate / market share of companies in sectors or product markets ...

4. Industrial Competitiveness – Evaluation of Regulation

- some sectoral analyses available, e.g. for UK with very mixed evidence on subsectoral level
- challenges / limits associated with approach:
 - data availability (frequency, subsectors)
 - longer term impacts of passing through carbon costs on investment / leakage remain uncertain → numerical models
- preferred: firm level analysis for consistent ex-post evaluation studies use representative firm or plant-level dataset of sufficient detail
- micro data are a prerequisite for credibly identifying the **causal effect** of a policy on an outcome variable
- sector level is too unspecific and therefore a second best

Framework for the Monitoring of Energy Prices, Cost and Competitiveness

Energy Prices

- National price development
- Comparison of price trends between relevant countries
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 - Relevant competitors
- Comparison of price level between relevant countries
 - EU / Non-EU
 - Relevant competitors

Energy Cost

- Development of energy unit cost within industrial sectors on national level
- Comparison of changes in energy unit cost between relevant countries
- Comparison of energy unit cost levels between countries

Competitiveness

- Ex-post evaluation of impacts on firm-level within a country
- Ex-post evaluation of impacts on firms from different countries
 - EU / Non-EU
 - Relevant competitors

5. Conclusion

- Framework for energy prices, energy cost and competitiveness
 - Broader discussion and development of broader framework necessary
 - Fact-based analyses with a set of indicators (and studies) internationally
- data has to be improved
 - better sectoral data and analyses
 - administrative data for firm level comparisons as long-term goal
 - international comparisons largely missing
- detailed studies of policy impacts needed:
 - heterogeneity across sectors and firms not well understood
 - ex-post evaluation of causal effects which impact competitiveness
 - auxiliary policies and interactions with ETS to be studied: What part of RES subsidies, EU ETS bmk etc. are actually benefitting industrial energy users? What is role of efficiency and innovation? What are cost impacts on industry?

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