Energy Prices, Energy Cost & Industrial Competitiveness:

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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-CO\textsubscript{2} 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
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?

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

![Graphs showing per unit wage costs and real per unit energy costs](image-url)
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**
Framework for the Monitoring of Energy Prices, Cost and Competitiveness

Energy Prices
• National price development
• Comparison of price level between relevant countries
  • EU / Non-EU
  • 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
  - EU / Non-EU
  - 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?