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Modeling Tools: Choice of Policy Instruments and Mitigation Options. Experience and Insights from Modeling for the EU ETS

Partnership for Market Readiness (PMR)
Fourth Technical Workshop: Instrument Choice for Mitigation: Modeling and Analysis & Data Management and Reporting

Dr. Felix Chr. Matthes

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- **The views and opinions presented in this paper are partly based on results from research commissioned by the German Federal Ministry for the Environment, Nature Protection and Reactor Safety, the German Federal Environment Agency and the European Commission.**
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Modeling is important for different phases of an Emissions Trading Scheme (like the EU ETS)

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- **Making a choice and building support for GHG mitigation**
  - Building the (numerical) case for GHG mitigation goals
  - Compare (numerically) different policy options
  - Identify coverage options (from a top down perspective)
  - Disclose implications (costs, terms of trade, carbon leakage, etc)
- **Implementing and parameterizing an ETS**
  - Setting the cap (also: building the basis for review & adjustment)
    - defining the efforts (difference between BAU and the cap)
    - allocate efforts to traded and not-traded sectors
    - identify and reflect policy interactions for traded sectors (renewable energies, energy efficiency etc.) as well as between traded and non-traded sectors
  - Parameterizing a wide range of ETS provisions (offsetting entitlements, new entrant reserve, etc)
  - Specifying compensation measures (consumers, carbon leakage)

Different purposes require different modeling approaches (1)

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- **Making a choice and building support for GHG mitigation**
  - Big top down models, typically CGEs, for the big picture (at least mainly used for this purpose in the EU)
    - reflect the complex interactions within an economy
    - allow to sketch interactions with the international market
  - Useful but need complementary analysis
    - general equilibrium approach is comparatively easy to calculate but does not necessarily reflect reality sufficiently
    - results are informative in terms of relative changes
    - many dimensions not or not comprehensively reflected (market distortions, policy interventions, technological progress etc.)
    - difficult to reflect some important features of ETS (e.g. compensation measures in phase-organized schemes)
  - Building sufficient transparency is a significant challenge

Different purposes require different modeling approaches (2)

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- **Implementing and parameterizing an ETS**
  - Simulation models often more suitable (and mainly used in the EU ETS)
    - more reliable in terms of absolute trends
    - more robust in terms of results
    - more sector specific
    - allow better technology foundation
    - allow better representation of policy interactions
    - allow integration of many real-world features of an ETS
    - (allow regional attributions)
    - have a potential (!) to be more transparent
  - Simulation models need to be designed to reflect ETS sufficiently (coverage, allocation, etc)

Modeling for the EU ETS
Some experiences

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- **Reflecting different purposes of modeling is important**
  - Tier 1: Informing policy makers (and the public) on the existing choices on goals and policy instruments
  - Tier 2: Implementing and parameterizing an ETS
  - Both tiers should not been mixed up
  - Both tiers need different and carefully reflected methodological approaches
  - Both tiers are important, need preparation as well as sufficient lead-time
- **Transparency on modeling and modeling assumptions is of key importance**
  - to build robust grounds for fundamental political decisions
  - to build a reliable basis for designing a wide range of ETS provisions
  - to provide also sufficient data for reviewing and adjusting ETS provisions

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Thank you very much

Dr. Felix Chr. Matthes
Energy & Climate Division
Büro Berlin
Schicklerstraße 5-7
D-10179 Berlin
f.matthes@oeko.de
www.oeko.de