

SUMMARY FOR POLICY-MAKERS

**Climate Negotiation and Emission Trading :
Economic Insight from European Models**

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1. Assessing abatement costs and emission trading with economic models

- Different categories of models (theoretical or applied, economy-wide or sectoral) have been used in order to simulate and assess the economic costs of CO₂ emission reduction policies*. Their quantitative results may differ significantly, but all of them point to the importance of the economic gains that can be expected from emission trading and flexibility schemes while maintaining the environmental objective.
- For the Kyoto targets, the CO₂ Marginal Abatement Costs from the models presented in the seminar lay in a typical range of 100 to 300 Euros/tC for autarkic abatement policies and of 50 to 100 Euros/tC for a full Annex B trading scheme. But it also appears that broader flexibility schemes (with Clean Development Mechanisms and/or Multi-Gas flexibility) may considerably reduce these costs, thus widening the range of the estimates.
- These differences in model results can be explained by four types of factors : the basic structure of the model, the sensitivity to the introduction of a carbon value of the different mechanisms described, the exogenous hypotheses (in particular concerning the growth of the economy) used in order to build the Reference – or “No climate policy” – case and the way the climate policies are supposed to be implemented.
- A harmonisation of the Reference case and of the policy simulation would probably significantly reduce the divergences in results, while the study of the remaining discrepancies would probably greatly enhance the understanding of the economic phenomena at stake in climate policies.
- In all models, emission trading brings benefits to all participants in the exchange, be they buyers or sellers of permits. However, the initial entitlement which necessarily precedes the implementation of permit trading implies distributional impacts, while the implementation of emission trading in the real world may raise institutional and technical challenges which models are not suitable to explore.

* The seminar allowed for the presentation and discussion of the results of the following models: CLIMOX / OIES, EDGE / Copenhagen Economics, EPPA / JPSPGC-MIT, IMAGE+FAIR / RIVM, MARKAL / ECN, PACE / ZEW, POLES / CNRS-IEPE & JRC-IPTS, PRIMES / ICCS-NTUA & CES-KUL, WAGE / Univ. of Oldenburg

2. The trading rules in the on-going international negotiation

- The real world conditions in which the Kyoto Protocol flexibility mechanisms have to be implemented, and particularly the probable existence of “hot air”, have induced the study and the discussion, at the international level, of mechanisms designed to control the impacts of emission trading, particularly in order to respect the “
in the first commitment period. This principle relates to article 17 of the Kyoto Protocol which allows emission permit trading as “supplemental” to domestic emission reductions.
- The consequences of these regulations or trading rules on the emission permit market are not trivial, as they may have an impact both on the demand and on the supply of permits. They may thus induce significant divergences from the market equilibrium situation and consequently a price instability.
- All theoretical analyses and modelling studies of trading rules show that if the demand constraint is binding, then the price of the emission permit would go down. This resembles a situation where a single buyer can manipulate the price on the expenses of the sellers (i.e. a monopsony). On the other hand, a binding supply constraint would create a monopoly-type situation, with prices higher than the equilibrium price. This would increase the revenues to the seller at the expense of the buyers of the emission permits. The distributional consequences of these divergences from equilibrium may be considerable.
- That is why several studies attempt to develop and simulate “hybrid” instruments that may allow to combine the regulation through quantities and the regulation through prices. They are designed in order to guarantee a minimum degree of complementarity, while controlling the costs and revenues of the different Parties. The full consequences and implementation conditions of these hybrid schemes remain to be fully explored, under contrasted market conditions.
- Modelling exercises have also been performed on the basis of the European Commission’s proposal for a European Tradable Emission Permit System entailing the energy industries and the large industrial consumers (Green Paper). They indicate on one hand, that this system may bring important welfare gains comparatively to the no-trade case. The compliance cost in the EU would decrease by about 23 %. Further it seems possible to implement the scheme initially for a limited set of participants (e.g. the electricity industry) while being consequently progressively extended.

3. Post-Kyoto entitlements schemes and their international equity and acceptability dimension

- While it appears that the Kyoto Protocol will only be a first step, if the will to mitigate Climate Change is taken seriously by all the Parties to the negotiation, it is also clear that any long term policy will imply an active participation of Non-Annex B countries. This immediately raises the question of the GHG entitlements for these countries that often incur a rapid process of economic change resulting in strong emission increases.
- Two main approaches can be used in order to design and study world entitlement schemes. The first one begins with the *a priori* definition of an international equity principle and then studies the consequences of this principle in the long run, in terms of welfare or abatement policy cost for the different Parties. Generally speaking these approaches do not guarantee a balanced distribution of the costs of abatement policies.
- The second type of approach starts with the recognition of the existence of a multiplicity of equity principles and tries either to combine them in a mixed system or to pragmatically design entitlement schemes that in the end may be judged acceptable – in terms of effort or burden sharing – by the different Parties.
- The full exploration of these schemes and the dialogue between the two different approaches characterised above will be highly necessary and useful, as it may in some sense be similar to the international negotiation process, when the question of the participation of Non-Annex B countries in a world entitlement scheme is raised.

4. The potential impacts of multi-gas flexibility

- The economic analysis of the impacts of the multi-gas flexibility and of carbon sinks can still be considered in its infancy. It already appears that these issues will be of major impact in the short term of the Kyoto Protocol implementation as well as in a longer term perspective. Consequently it appears important to devote substantial resources to better understand the role of non-CO₂ gases in global warming.
- The consideration of multi-gas flexibility will probably induce important refinements of abatement policies up to now defined while considering CO₂ only, as it may substantially alter the global abatement cost and CO₂ emission reduction targets, at least in the short term. The control and the proper measurement of the corresponding emissions or abatements will, however, be still more difficult in most cases for the other gases and for sinks than for CO₂.
- Multi-gas flexibility and sinks will also oblige to considerably enlarge the scope of modelling and economic assessment studies. While land-use and agriculture are directly concerned by this enlargement, it also appears that multi-gas abatement policies may have strong connections with urban pollution management policies, with large ancillary benefits from one policy to the other.
- The emergence of these new issues calls for intensified exchanges among modellers on data resources and analytical methods. It also clearly indicates that research to be developed in the future, whether in natural or in social sciences, will probably have to supplement the prevailing energy-environment nexus with agriculture, waste, transport, industry and urban management policy issues.