

# EU and World Macroeconomic and Energy Modelling for Policy Analysis

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Information Day on Renewable Energy  
Technologies and Socio-economic Tools  
Brussels, 19 October 2004

# General background

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- EU Strategy for sustainable development (Gothenburg, Johannesburg) and sustainability assessment of EU policies
- Interactions between the different objectives (energy, economic and environmental) both at medium and long term is important issue
- Development of socio-economic tools to contribute to the definition of the EU strategy, activity already financed under the EU framework programs since many years.

# Types of Models (1)

- Integrated assessment models for the long term global outlook (e.g. IMAGE, MERGE, CWSM). Their focus is:
  - construction of global scenarios
  - coalition formation
  - cost benefit analysis within optimisation framework
- Energy modelling tools at EU and World level oriented towards the medium term (e.g. POLES, MEDEE, PRIMES, TIMES). Their focus is:
  - perspectives in the energy markets
  - depletable resource issue
  - energy technologies and their penetration

# Types of Models (2)

- Macroeconomic models (GEM-E3 Europe and World, NEMESIS)
  - econometric or computable general equilibrium paradigm with specific features as
    - the integration of the environmental dimension (local and global)
    - the endogenous modelling of innovation and RTD strategy
    - a technological dimension for the energy sectors
  - focus on the society response in terms of policy instruments (regulation, taxes, emission trading schemes, RTD subsidies) and their impact on the economy and the environment.

# Issues for model development

- Better integration of the global environmental dimension incl. benefits (e.g. through reduced form of climate model in macroeconomic models) and the impact of uncertainty on policy decisions
- Strategic behaviour of actors on the energy and environmental markets
- Integration of the outcomes of the different modelling frameworks through soft links or reduced forms
- Database development for 'low carbon' technologies, their potential and cost
- Update of the different models and their database

# Scenario analysis and policy evaluation (1)

- For the long term (horizon till 2100):
  - Identification of future global issues regarding climate change, depletable resources, security of supply;
  - Cost benefit analysis of climate policy, inclusive the formation of coalition and equity issues
  - Impact of the timing of the policy on the cost of reaching a “climate” target

# Scenario analysis and policy evaluation (2)

- For the medium term (horizon till 2050):
  - RTD strategy for new technologies with its impact on innovation and on the cost of energy/environmental policies in the EU, identification of the most promising technologies
  - Evaluation of energy/environmental policies for Kyoto and post Kyoto:
    - impact on the EU and World energy system (demand and supply of energy, price of energy, security of supply)
    - macroeconomic impact (welfare incl. environmental benefits and distributional impact, competitiveness, terms of trade, employment) at EU and World level.

# Dissemination of the tools

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Dissemination of the modelling expertise in the New Member States through :

- Implementation of some models in those countries (already some experience for energy and economic models)
- Policy simulations specifically oriented towards those countries