



UNFCCC: In-forum expert meeting on response measures

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area (e) - Economic modelling and socio-economic trends

Insights from global E3 modelling

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- ◆ Global Interindustry Forecasting System:
 - (1) Global multi-country approach: EU27 + major trade partners
 - (2) Based on international datasets: IMF, OECD, IEA, UN, SERI
 - (3) Multi-sector approach (48 sectors, OECD IO tables)
 - (4) Disaggregated bilateral international trade (OECD BTD)
(26 sectors, trade shares price dependent)
 - (5) Endogenous explanation of economic development and its linkage with the environment
 - (6) Agents behave under conditions of bounded rationality: econometrically estimated parameters:
no general equilibrium, which reduces economic impacts

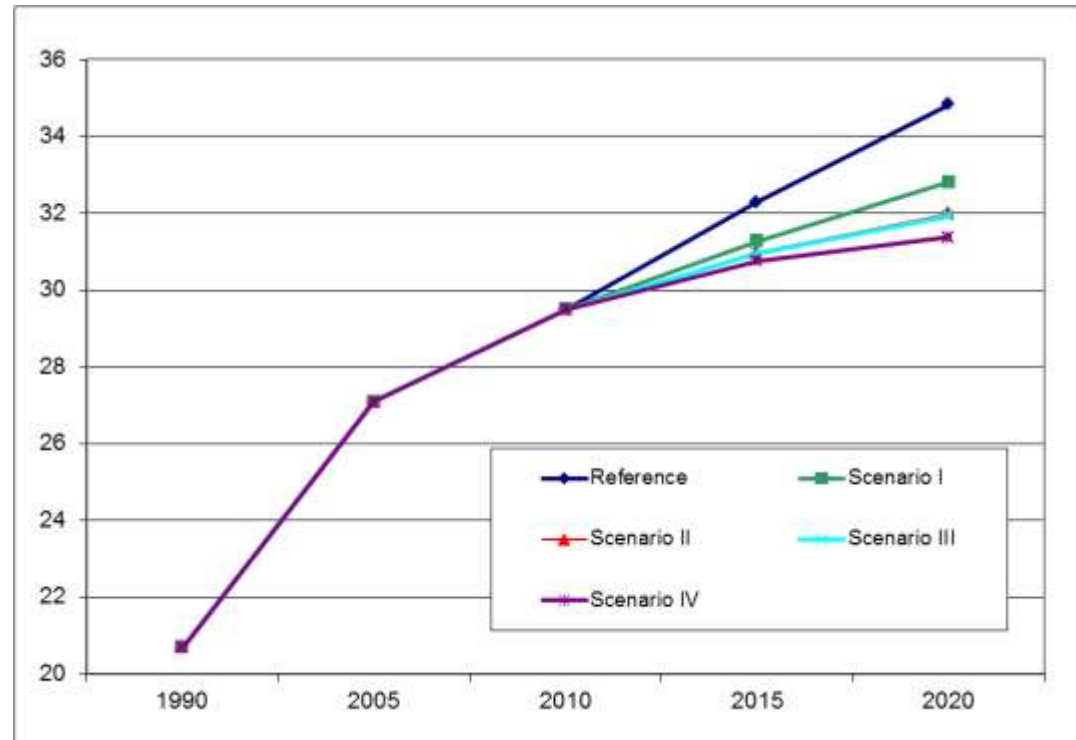
Economic modelling as scenario analysis:

- ◆ Model simulations with changes of few parameters (e.g. carbon prices) describe complex processes,
- ◆ which take different structures (global trade flows, economy, energy-intensity, carbon-intensity) and
- ◆ feedback loops into account.

Own studies on economic impacts of different carbon price regimes for ministries, foundations, EU institutions:

- ◆ Reference: Current policy
- ◆ Post-Kyoto scenarios
 - ◆ EU: -30% GHG emissions until 2020
 - ◆ CDM measures up to 50% of total reduction for indust.countries
 - ◆ Scenarios differ by reduction efforts of non-EU countries

Global energy related
GHG emissions in the
scenarios until 2020:



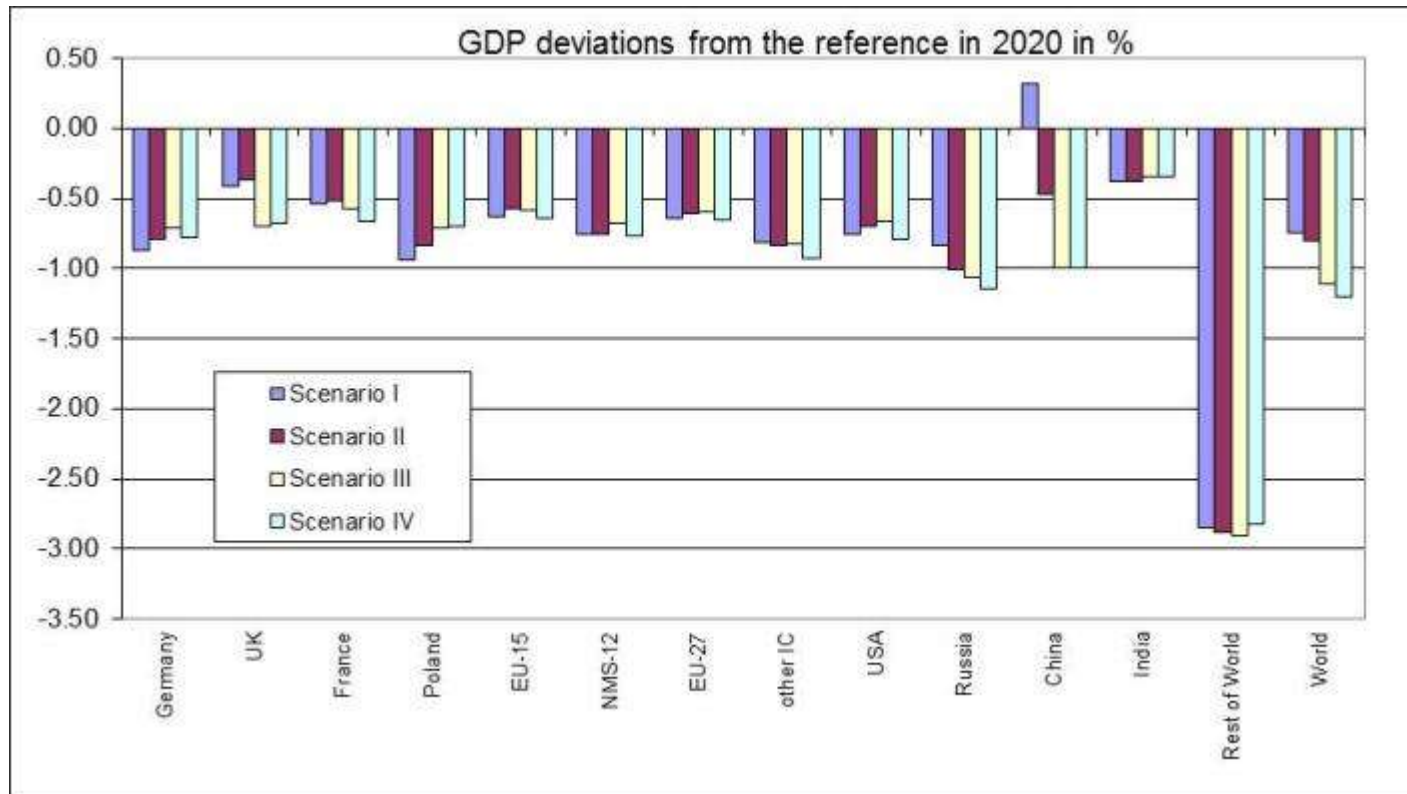
Scenarios for different international Post-Kyoto regimes

- ◆ Reference: Current policy
- ◆ Scenario I:
Other countries: Copenhagen Accord (**minimum** reduction targets);
- ◆ Scenario II
Other countries: Copenhagen Accord (**maximum** reduction targets)
- ◆ Scenario III:
building on sc. II: change country efforts to equalize GDP losses between industrialized and emerging economies
- ◆ Scenario IV:
building on sc. III: reach IEA 450 ppm Scenario with comparable additional GDP losses for ind. and emerging countries

Carbon prices in the different scenarios in US\$2010:

Scenario	EU	USA	other IC	emerging economies
Reference	28	0		
Scenario I	40	20	0 - 20 - 40	0
Scenario II	40	20	20 - 40	0 - 5
Scenario III	40	20	20 - 40	0 - 5
Scenario IV	45	25	25 - 45	0 - 10

- ◆ Design of Post-Kyoto climate regimes may adjust the macroeconomic costs (in % of GDP) for industrialized and emerging economies
- ◆ Highest GDP losses for exporters of fossil fuels independent of regime specifications



- ◆ State-of-the-art studies concentrate on issues like
 - ◆ Burden sharing between Annex I countries and/or emissions-intensive emerging economies
 - ◆ Carbon leakage/relocation of industries to low/zero carbon price countries
- ◆ What studies in general do not take into account concerning low income and energy exporting countries:
 - ◆ Technology spill-overs
 - ◆ PV price reduction by massive investment in some countries
 - ◆ Effects of flexible mechanisms
 - ◆ Assume constant fossil fuel supply, i.e. lower international energy prices due to climate mitigation policies, though energy suppliers probably will react
 - ◆ Value added of new (renewable) technologies along the global values chains (see recent IRENA work, www.irena.org)
 - ◆ Market imperfections

- ◆ Economic impacts of response measures even for rest of world are small compared to
 - ◆ the uncertainty about the overall socio-economic trend
 - ◆ effects related to historic changes in international energy prices
 - ◆ the global financial crisis
 - ◆ costs of climate change (no action)

- ◆ Further studies on economic impacts of international climate mitigation measures should
 - ◆ Focus on non-Annex I parties and feedback options
 - ◆ Build on national specifics
 - ◆ fossil fuel exporting countries are neither uniform nor single-dimensional
 - ◆ Often want to reduce energy dependence anyway
 - ◆ Include potential positive impacts or how they might be stimulated