

Modelling challenges in the POEM project

ETSAP Nov 9, 2011

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Outline

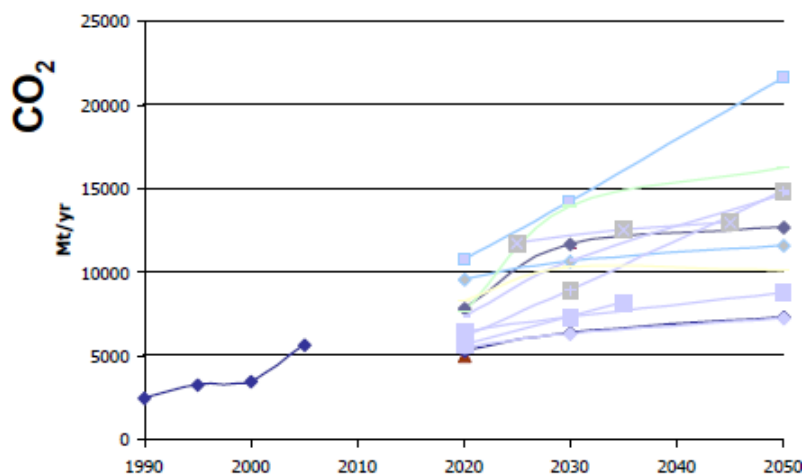
- Harmonization & MAC curves
- Model interactions
- Burden sharing

Policy Options to engage EMerging Asian economies in a post-Kyoto regime – POEM (EC FP7)

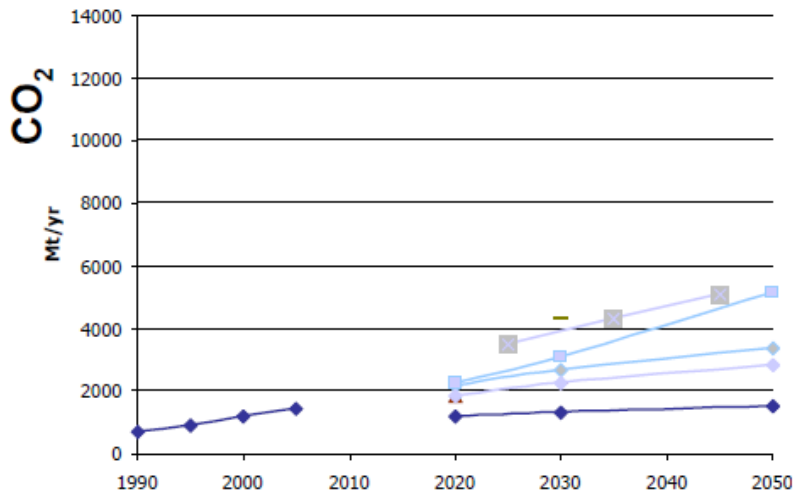
Project aim: contribute to knowledge on consequences of different ways of reaching both *development* and *climate objectives* in India and China.

Hypothesis: it is only possible to achieve both objectives through combinations of policies and measures at international and national levels.

CO₂ emissions China



India



Issues

- Can the different objectives be reached simultaneously in a clever way ?
- What is the “true” mitigation cost of different pathways ?
- Are cost and benefits path dependent ?
- Potential impact of national and international policies?

Climate or development first?

Participating organisations

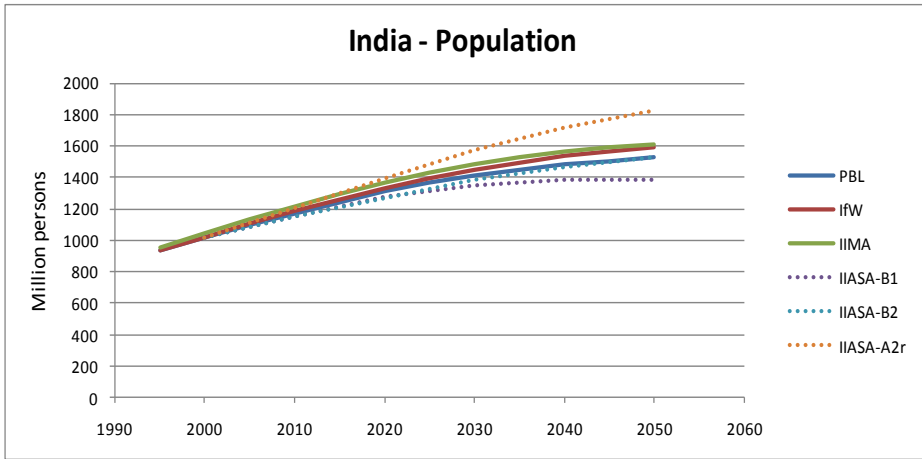
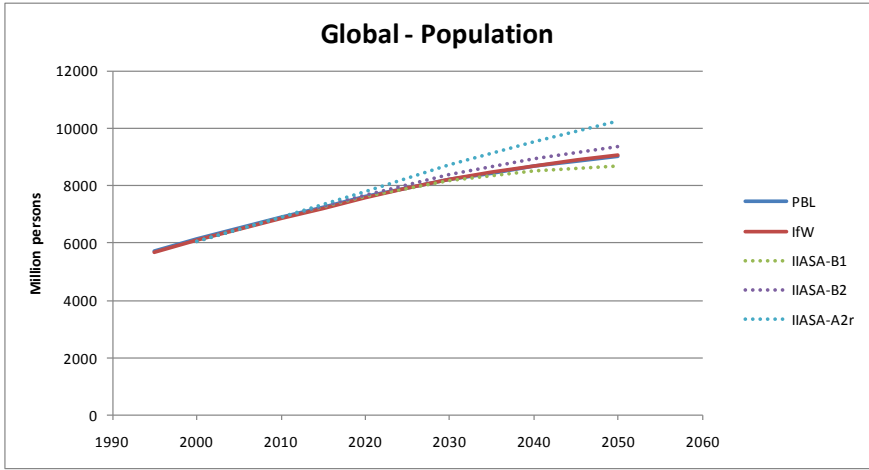
- Chalmers University of Technology, Sweden
- Netherlands Environmental Assessment Agency, The Netherlands
- Tshinghua University, China
- Center for Energy and Environmental Policy Research, Chinese Academy of Sciences – Beijing Institute of Technology, China
- Kiel Institute for the World Economy, Germany
- Indian Institute of Management, Ahmedabad, India
- Indian Institute of Economic Growth, India

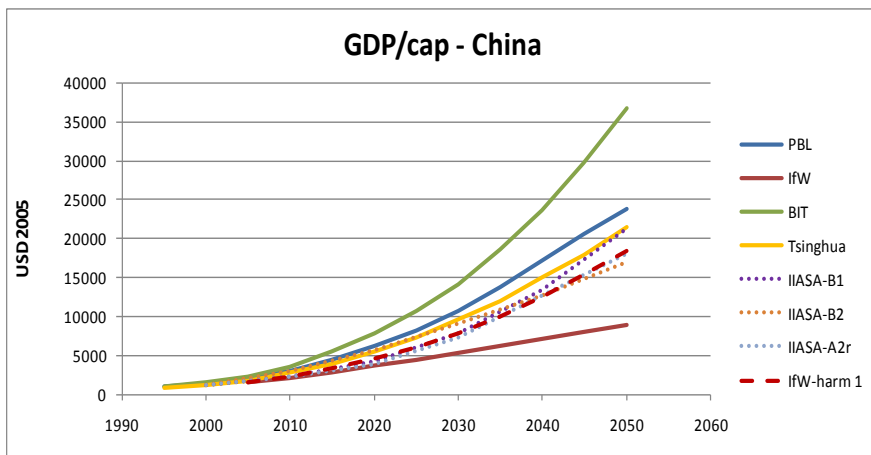
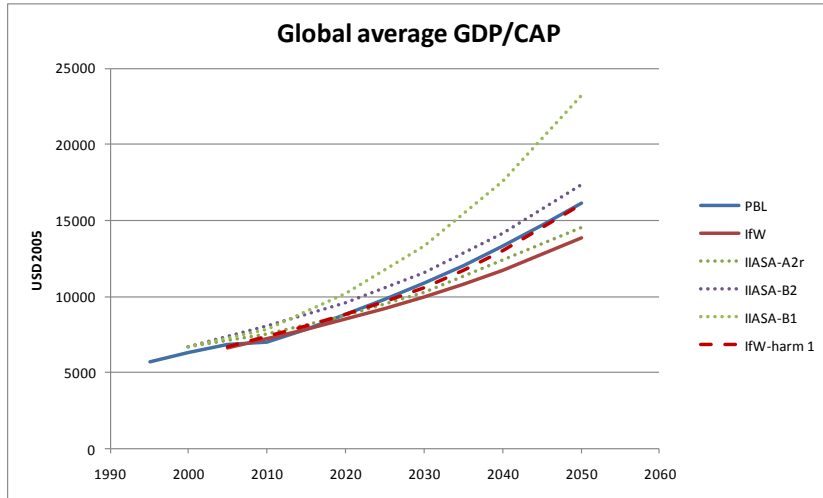
Global and national models

- the global climate model FAIR connected to global energy model TIMER,
- the global GE model DART,
- the global population and health model PHOENIX,
- national macro-economic models,
- national energy system MARKAL models.

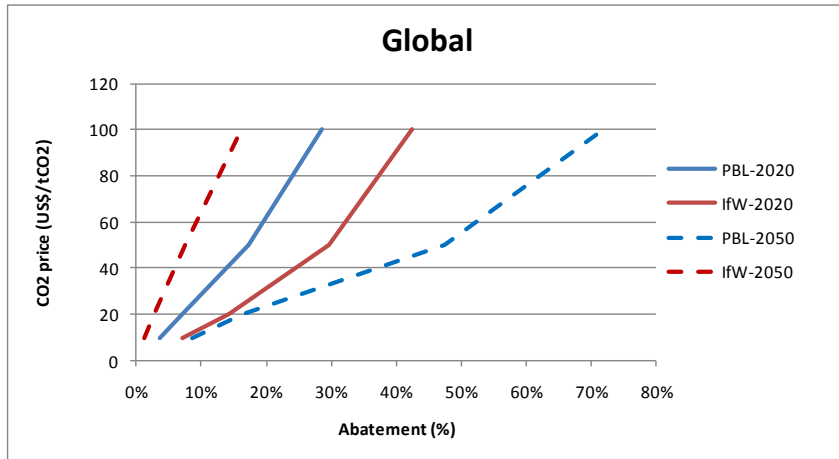
Where to start?

- Model comparisons
- Model harmonizations
 - GDP
 - Fuel prices
 - Technology characteristics
 - MAC curves

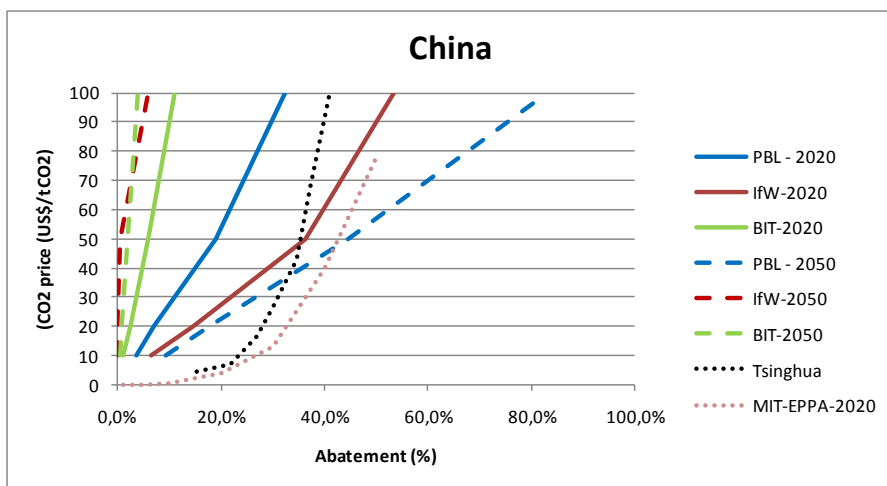


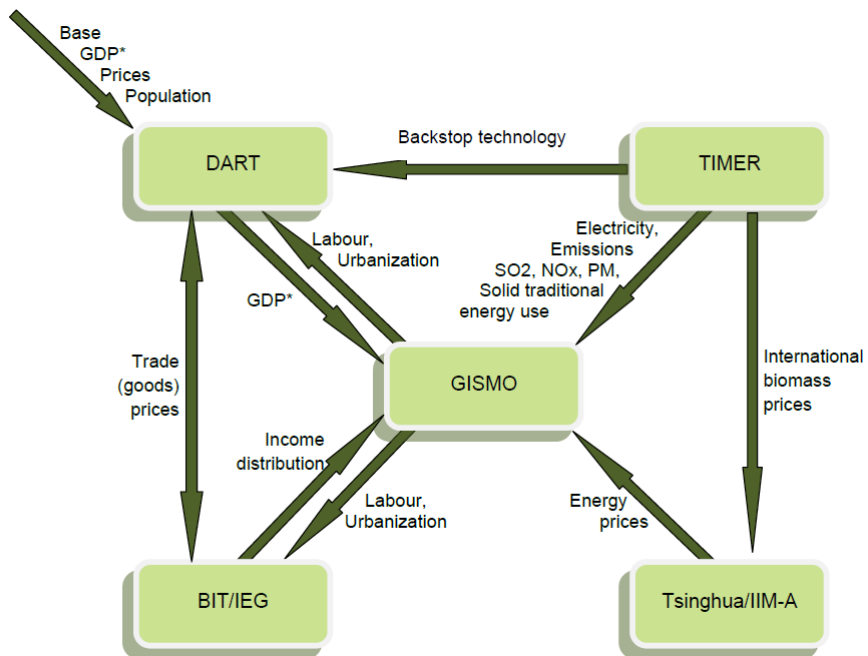
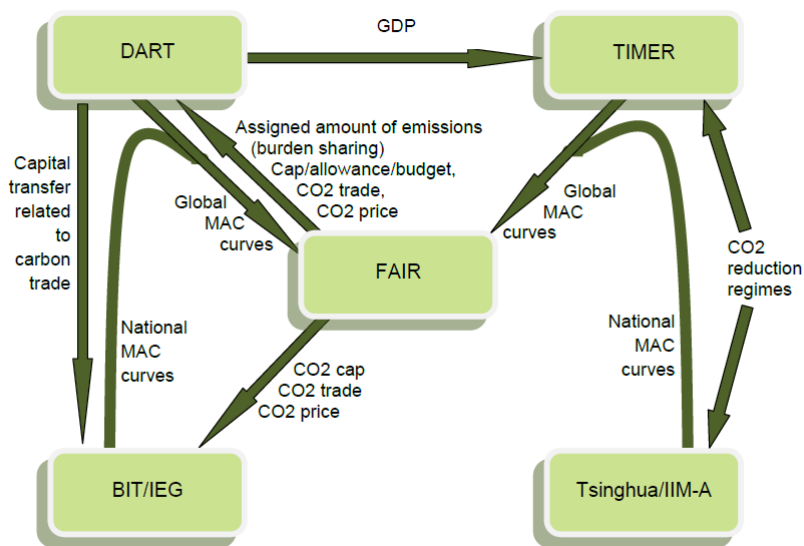


Non-harmonized



Non-harmonized

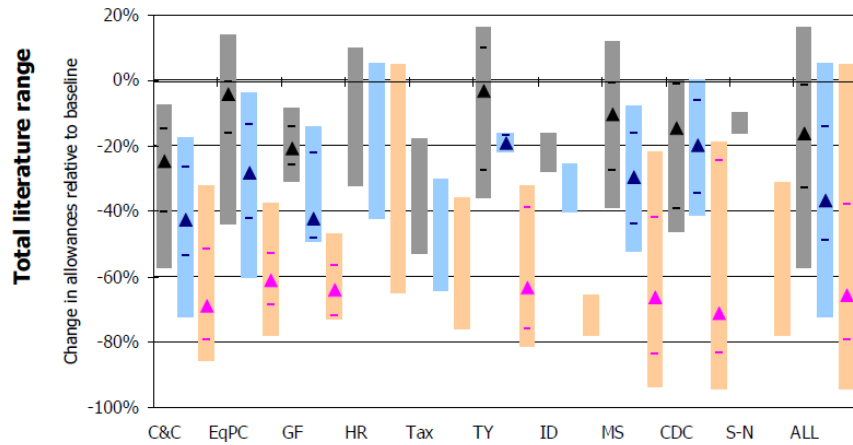




Burden sharing regimes

Name	Abbreviation	Short description
Direct participation		
Contraction & convergence	C&C	Emission targets based on a convergence of per capita emission levels of all Parties under a contraction of the global emission level
Grandfathering	GF	Distribute permits in proportion to current emissions
Equal per capita allocation	EqPC	Distribute permits in proportion to population
CSE convergence	CSE	Per capita emission convergence (C&C) combined with basic sustainable emission rights, by Centre of Science and Environment
Historic responsibility*	HR	Distribute permits in proportion to the contribution of climate change over a certain period of time
Multicriteria	MC	Distribute permits based on a formula including several variables, such as population, GDP and others
Global compromise	GC	Allocation of the global emission allowances based on a population-weighted preference score voting for either emission (Grandfathering) or per capita allocation
Triptych	TY	National emission targets based on sectoral considerations
Horizontal equity	Hor	Distribute permits to equalise net welfare change as % of GDP
Vertical equity	Vert	Progressively distribute permits proportions inversely correlated with per capita GDP
Emission Intensity*	EI	Emission reductions related to improvements in the emissions per unit of output, with a participation threshold
Carbon tax	Tax	All countries agree to a common, international GHG emission tax
Gradual participation		
Multi-stage	MS	Countries participate at different stages and with stage-specific types of targets; countries transition between stages as a function of indicators such as income and emission level
Common but differentiated convergence	CDC	All countries' per capita emissions converge, but differentiated, as countries only start to converge when their per capita emissions are at a certain percentage above the global average
South-North Dialogue proposal	S-N	Countries participate in the system at different stages and with stage-specific types of targets
Ability to Pay	AtP	Emission reduction requirements based on per capita income levels, with a participation threshold
Income Distribution	ID	Distribute permits in proportion to the share of rich or poor people in a country, with a participation threshold

Burden sharing regimes – results for China



Regimes analyzed

- Intensity targets
- **CDC (common but differentiated convergence)**

Results to be reported in a year.

Thank you.