

From G8 to L20 – The Costs of Leadership in Climate Policy

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From G8 to L20

Kyoto framework

- 160-nation bureaucracy of the UN process
- Too inclusive for effective negotiation process

Key idea of L20 approach (e.g. Victor 2004, Kopp 2005)

- Leverage on negotiation outcomes by focusing on a small number of countries (key players)
- Issue Linkage easier
- Coalition Theory: “narrow & deep ↔ broad & shallow”

Heiligendamm Process

- Topic-driven dialogue / sharing knowledge
 - Investment environment
 - Energy efficiency
 - Technological cooperation

Questions

- Composition of L20
- Political & economic feasibility of L20: Cost incidence of L20 leadership²

Climate Coalitions (I)

	KP Ratified	Annex1		L20 (Ranking)	G8+5 (Heidigendamm)	AP6 (Old Bush)	Top 15 CO2 (New Bush)	Our Analysis (Leaders)
EU 27	●	●		■	■		■	■
USA		●		■	■	■	■	■
Japan	●	●		■	■	■	■	■
Canada	●	●			■		■	■
Russia	●	●		■	■		■	■
Brazil	●			■	■		■	■
Mexico	●			■	■		■	■
China	●			■	■	■	■	■
India	●			■	■	■	■	■
Indonesia	●			■				■
South Africa	●				■		■	■
South Korea	●					■	■	■
Australia		●				■		
Iran	●						■	

Climate Coalitions (II)

L20 Ranking	G8+5 Heiligendamm	AP6 Old Bush	Top 15 CO₂ New Bush	Our Analysis Leaders	Kyoto Annex 1
Statistics	Related to G8 Energy Efficiency	Tech Transfer Private Sector	Energy Security Economic Security Technology	Synthesis	
Percentage of World CO ₂ Emissions in 2003					
75%	77%	52%	79%	81%	55%
Average CO ₂ Emissions per Member of Coalition [MtCO ₂ per Member]					
2170	2010	2250	1870	1740	960

Policy Scenarios – Dimensions of Analysis

Leaders: “Unilateral” Commitment

0, 5, 10, 15% versus 2001 in 2020; (15%: -33% vs. Leaders'-BaU 2020
or +1% vs. 2001 globally)

Participation of ROW: Might join abatement efforts

None	no abatement efforts in ROW, unlimited carbon budget (leakage!)
None-LC	as before, BUT Leaders compensate leakage by more abatement
FlexMex	Participation in Flexible Mechanisms BUT ROW accepts BaU as emission budget

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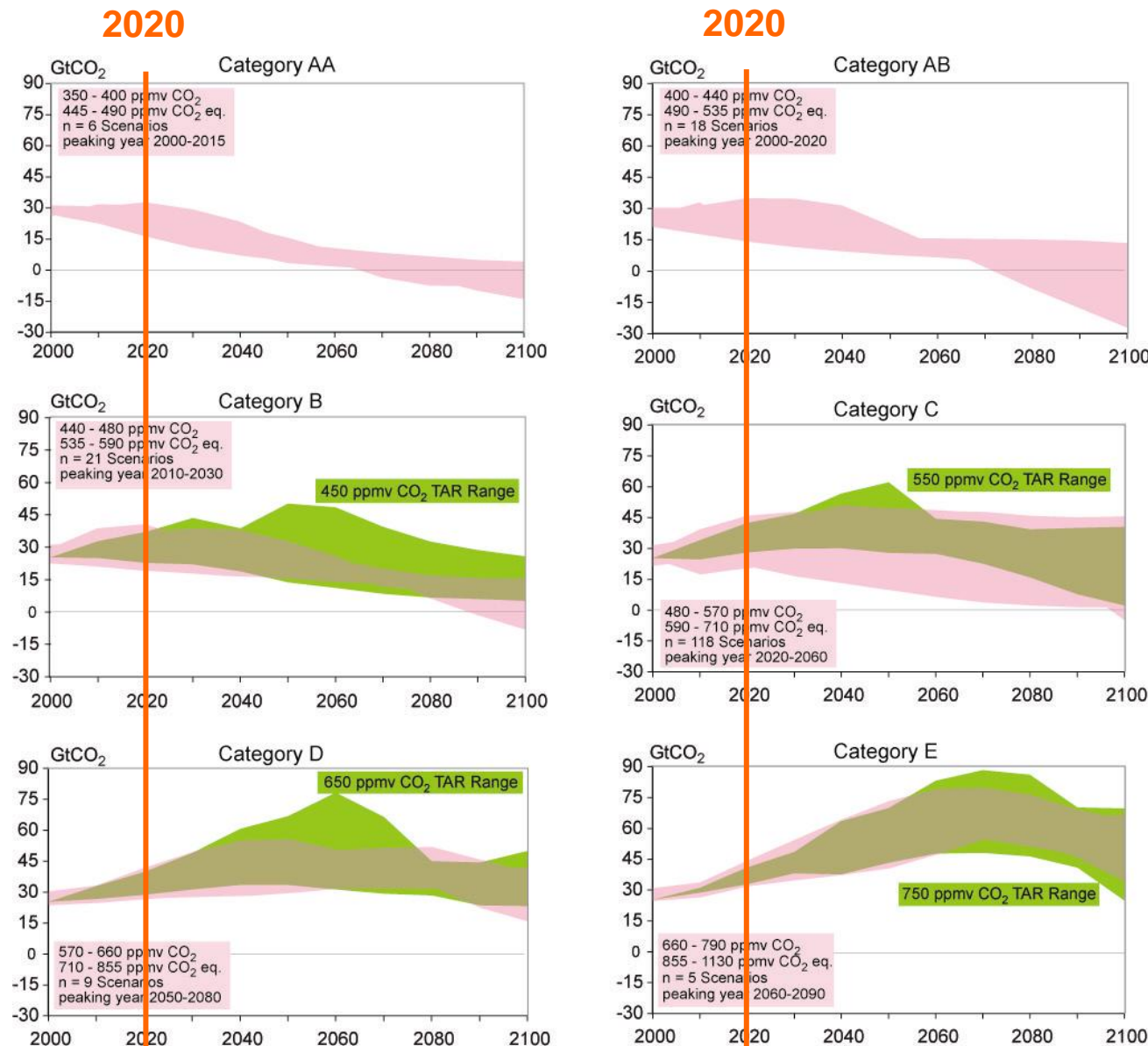
None-LC as before,
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FlexMex Participation in Flexible Mechanisms
BUT ROW accepts BaU as emission budget

same global emissions

Scenarios – IPCC 2007 WGIII

Here:
Global emissions are
not declining until
2020.



Analytical Framework

Key features

- Multi-sector, multi-region computable general equilibrium (CGE) model
- Comparative Static framework (forward calibration to 2020)

Base year calibration: GTAP6

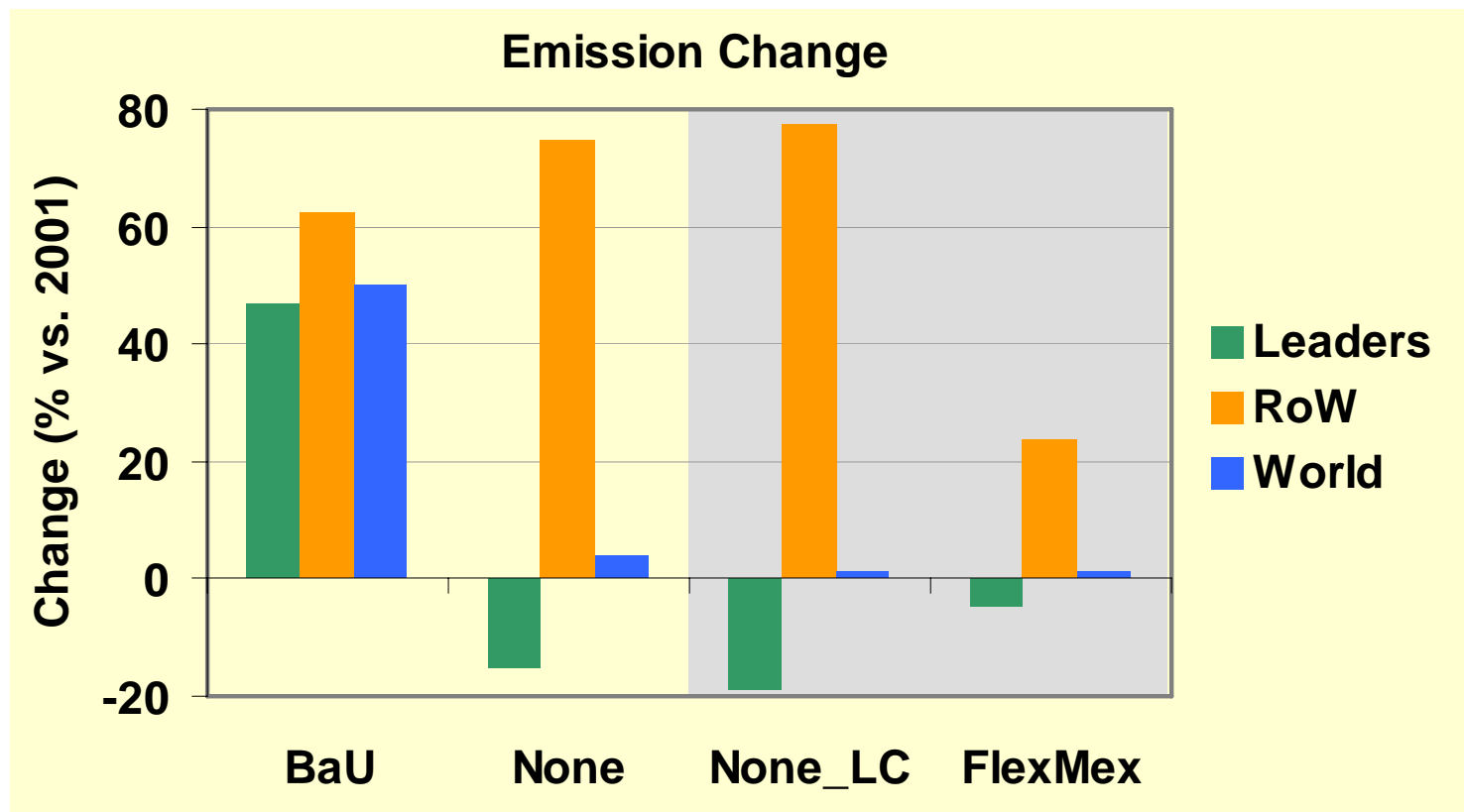
- Input-output tables and bilateral trade flows
(87 regions, 57 sectors → aggregated)
- Harmonized energy flows (IEA energy balances and statistics)

Baseline projections: IEO/DOE 2005

- Region-specific projections for GDP, energy use and crude oil production

Emissions

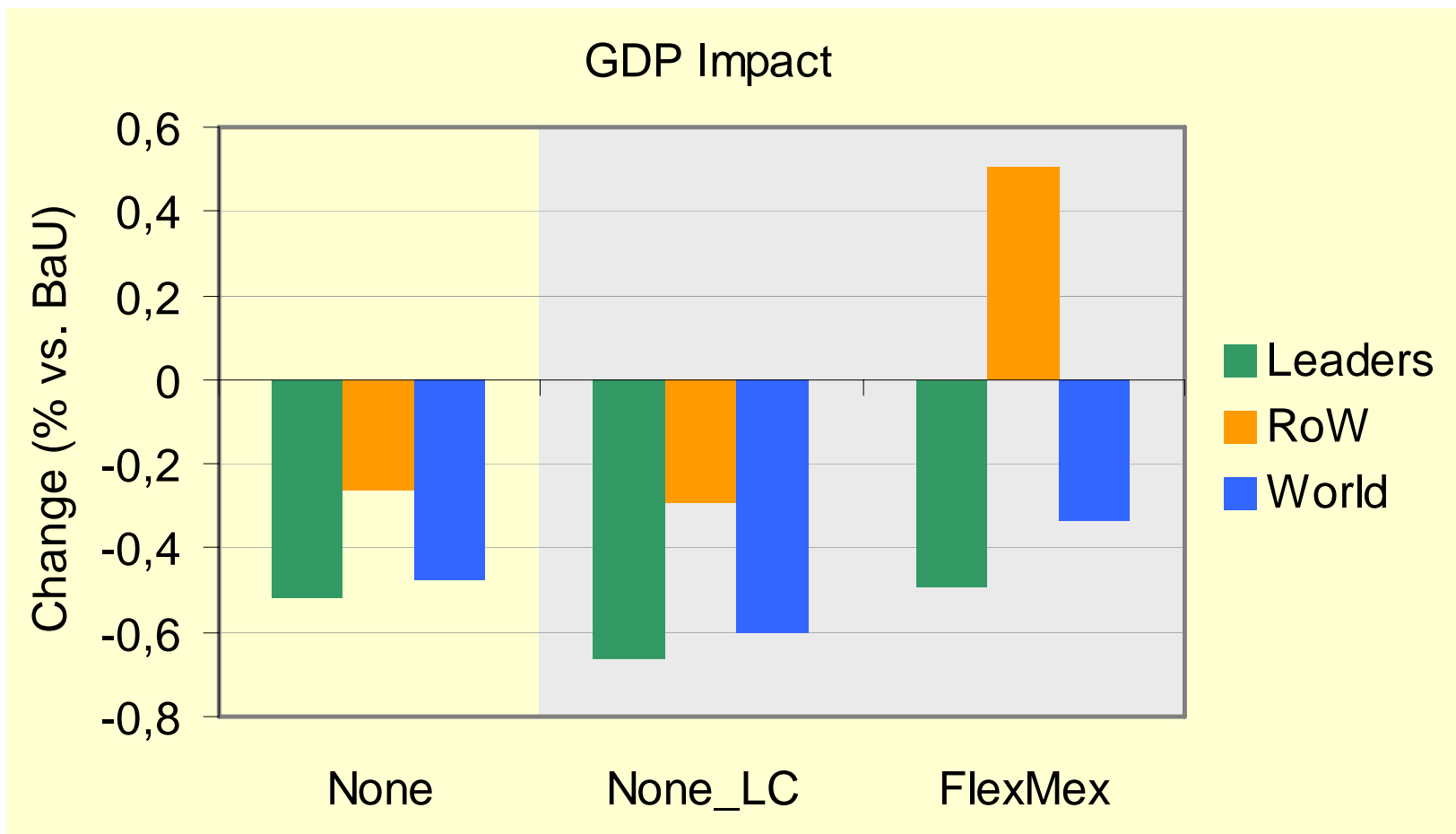
- 15% Reduction vs. 2001 – Unilateral Commitment by Leaders



- Leaders are reducing over-proportionally
 - Leaders' fraction of 2020 BaU emissions: 77%
 - Leaders' fraction of 2020 absolute abatement (vs. BaU): at least 83%

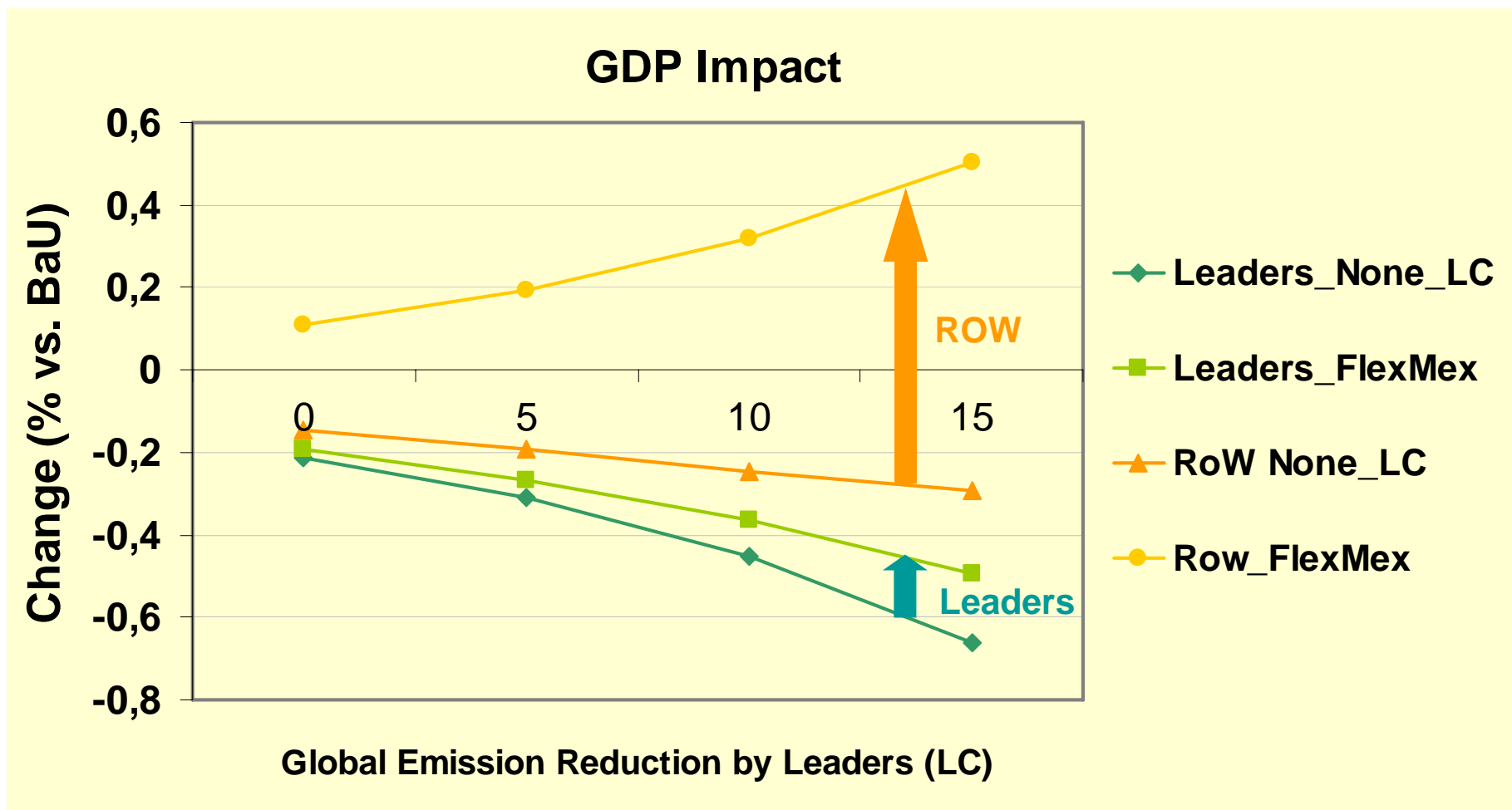
Costs

- Costs appear limited
- Unilateral commitment w/o any FlexMex costly for ROW as well (ToT)
- FlexMex: ROW gains; Leaders' costs substantially reduced



Costs

Incentives to participate via Flexible Mechanisms



Results

Emissions

- 15% Reduction of Leaders vs. 2001
 - May help stabilizing global emissions (even without ROW participation)
 - Can increase emissions in countries NOT participating (leakage)
 - Abatement will mostly happen in Leaders' countries

Costs

- Seem small (<0.6%)
- Leadership:
 - Globally 100% higher as compared to a hypothetical efficient world (including Kyoto flexible mechanisms)
 - Leaders 35% higher
 - ROW will loose without participation, but gain with FlexMex
- Kyoto/UNFCCC process (FlexMex):
 - realize efficiency gains
 - disputes over equity issues (again)

Thank You !

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Final Comments

Many Important Aspects not analyzed

- What about the incentive to be part of the Leaders coalition
 - Issue linkage (not modeled)
 - Stability, expansion of the coalition
- Just two parts of the World? – Leaders and ROW
 - Allocation of abatement within Leaders will be the really thorny issue (Group not homogeneous: US, China, EU, Russia, Japan,...)
 - Btw: ROW inhomogeneous as well!
 - Effects of allocation within Leaders not modeled (small for the aggregate)
 - Some of ROW may choose to participate, others not (Scenario-mix)

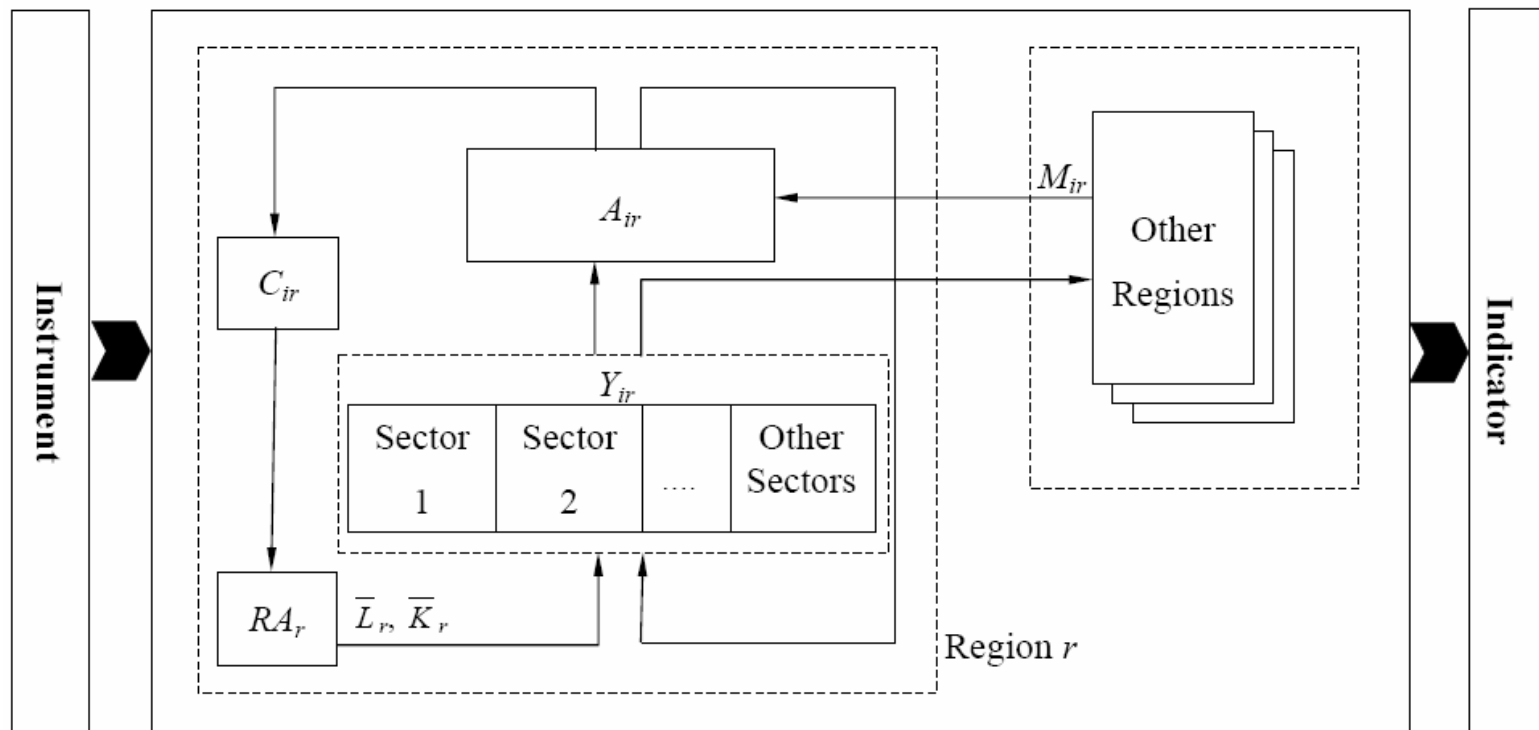
Policy

- Within an L20 forum it might be easier to strike a deal – other Strengths
- Could take place within the UNFCCC frame
- Might help to end some “Policy Deadlocks” in this field

Analytical Framework

PACE (Policy Assessment based on Computable Equilibrium):

- Multi-sector, multi-region model of the global economy
- Incorporation of market interactions and income closures
- Calibration of technologies and preferences based on empirical data



L-20 Summary Statistics

Table 1: TOP 20 in CO₂ emissions, GDP, and population (% in world Total)

	Shares for data in 2001*			Shares for data between 2000-2030**		
	GDP	Population	Emissions	GDP	Population	Emissions
EU-30	24.2	8.0	18.1	20.5	6.6	14.2
USA	35.1	4.5	23.5	34.6	4.2	21.2
Japan	12.4	2.1	5.3	9.8	1.7	4.0
Russia	0.9	2.4	6.1	1.1	1.9	5.2
Brazil	1.5	2.8	1.4	1.6	2.7	1.6
Mexico	2.1	1.6	1.6	2.3	1.6	1.6
China	3.7	20.8	13.4	6.5	19.1	19.5
India	1.7	16.4	4.1	2.6	16.5	4.8
Indonesia	0.5	3.5	1.2	0.7	3.4	1.3
Total	82.1	62.1	74.7	79.7	57.7	73.4

* Based on GTAP6 (Dimaranan, and McDougall, 2006)

** Based on GTAP6 and IEO2005 (DOE, 2005)