

A Perspective on Global Solutions to Climate Change

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I. What Do We Have?

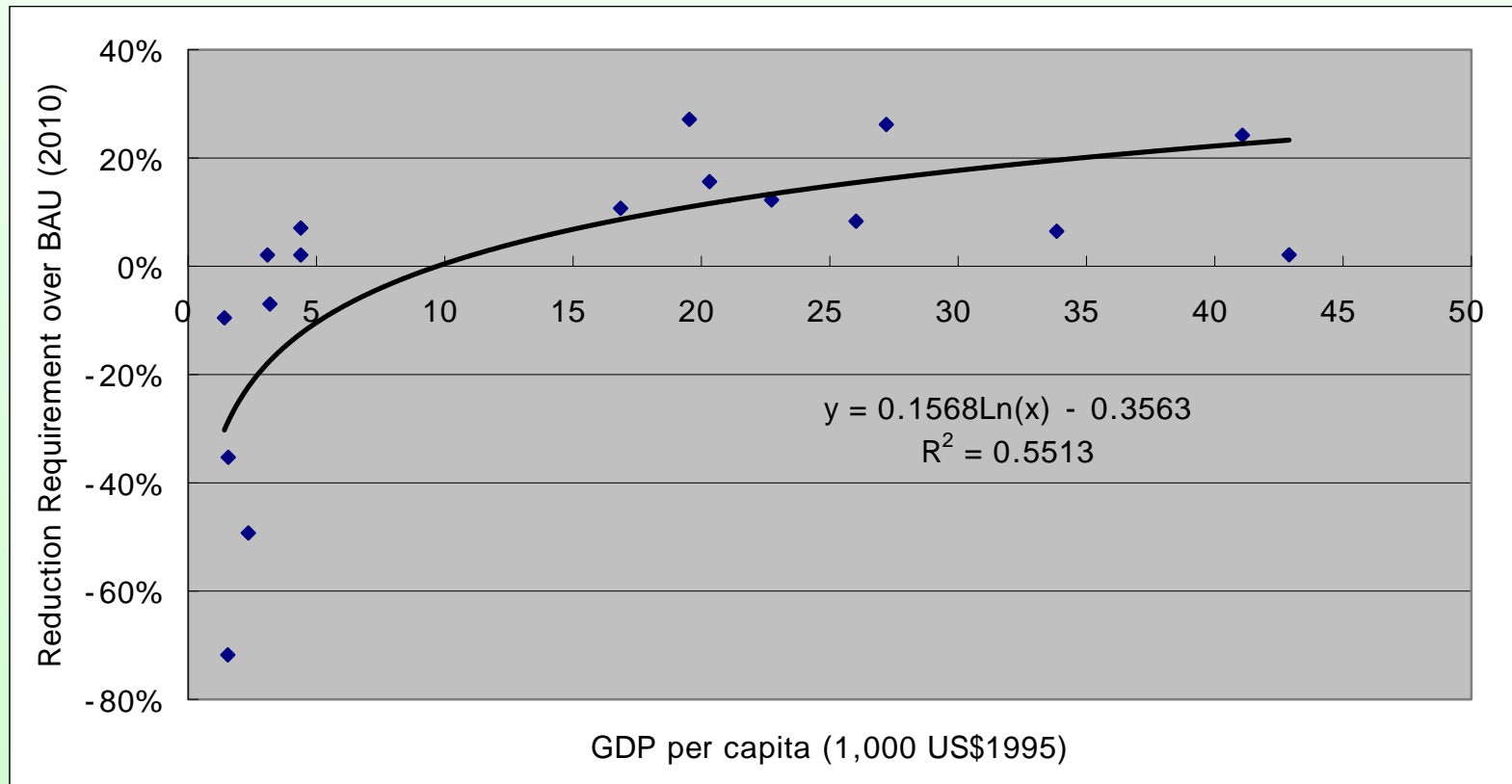
- UNFCCC and Kyoto Protocol
 - Quantified reduction targets on ICs according to common but differentiated responsibilities
 - Kyoto mechanisms
 - No principle (guideline) for mitigation after 2012
- Marrakech Accords and Delhi Declaration
 - Three new funds / dilution of Kyoto targets
 - Emphasis on Sustainable Development and Adaptation

II. Original Kyoto Commitment Revisited

- What does Kyoto Commitment mean to DCs?
- Analysis (KEI, 2002) on the relationship between 'Emission reduction requirement compared to BAU' and
 - Emission per capita ($R^2=0.28$)
 - Hot air for countries below 10.9 tCO₂
 - GDP per capita ($R^2=0.55$)
 - Hot air for countries below 11,900 \$
 - Emission intensity ($R^2=0.64$)
 - Hot air for countries above 2,003 tCO₂/m\$
- Almost all DCs had given up hot air in Kyoto!

III. Kyoto Commitment and GDP per capita

- Korea lost hot air of 3.1% of BAU emission
 - GDP per capita of Korea in 1995 = 10,200 \$



IV. Dilution of IC's mitigation commitment

- Strength of IC's commitment after Marrakech
 - Net reduction requirement could be minus
 - Banking might increase permit price, but only for the future benefit of ICs

Source	Scenario	Actual Reduction (MtC)	Permit Price (\$/tC)	Abatement Cost (M95\$)
RIVM	Original KP	725	48	10,974
(2001)	Marrakech Accords	-183.5	0	0
IEPE	Original KP	755	36	19,000
(2002)	Marrakech Accords	115	9	1,500

V. What Have Been Done?

- Annex II countries' emission change:
 - Emission increase higher than world average
 - Intensity reduction less than world average
 - Per capita increase contrary to decrease of world average

Change of CO2 from Fossil Fuel (1990-2000)

	Emission	Intensity (Exchange Rate)	Emission per capita
World	12.3%	-11.5%	-1.8%
Annex II	12.6%	-10.6%	5.7%
Annex I EIT	-32.0%	-13.0%	-28.9%
Non-Annex I	36.1%	-9.0%	15.5%

VI. What Do We Need?

- Double Conditionality of Commitments
 - Stronger leadership from ICs conditional on DC's participation
 - Follow-up action by DCs conditional on IC's stronger commitment
- Mechanism Design for Global Participation
 - Voluntary commitment at the initial stage
 - Example: For 2nd period, strong targets for ICs and no-regret targets for DCs
 - Continuous improvement of individual targets
 - 'Flexible but consistent' target indicators directly related to GHG emissions

VII. Lessons from Economics

- Natural Inefficiency due to Global Commons: Over emission
 - Solution: Single price for emissions but Personalized compensation rates according to individual Willingness-to-Pay
- Equity: Pareto-improvement (Every player gains)
 - Burden sharing agreement: emission allocation and side payment
- Efficiency: minimize Cost & Risk
 - Global emission trading market
 - Dual-intensity targets
- Inefficiency from wrong incentives
 - Carbon leakage, moral hazard, adverse selection

VIII. A Proposal for Global Mechanism

- Every major player takes voluntary target
 - Target form should be flexible but consistent over time
- Starting from the voluntary target, adjust the target through mutual cross-subsidy
 - Every country offer subsidy rate (=willingness-to-pay) for reduction of any other country
 - Each country faces the sum of subsidy rates, offered by all the other countries, for adjustment of its own target indicator
- Combine supplementary measures
 - Dual targets and Price-cap
 - Side-payment (for adaptation and other compensation)
 - Global fund for mitigation: contribution according to WTPs / payment through single price

IX. Case Studies

- Tradable Tagged Permit System(TTPS) for Global Pollution Control
 - Ahn & Kim, *J of Policy Modeling*, 2001
 - TTPS facilitates convergence to the optimal steady-state at a reasonable rate
 - About 90% of potential welfare gain is achievable, through voluntary pledge deal at the starting point.
 - Every country is better-off
- Reducing Uncertainty through Dual-Intensity Targets
 - Kim & Baumert, *Building on the Kyoto Protocol: Options for Protecting the Climate*, WRI, 2002
 - Dual-Intensity Target is workable and could,
 - Reduce risk of non-compliance and hot air
 - Make commitments stronger and environmentally sound
 - Promote wider participation