CIGS キヤノングローバル戦略研究所 The Canon Institute for Global Studies

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Z650 Scenario and Practical Approach

Fengjun Duan
The Canon Institute for Global Studies

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Estimates of the aggregate economic costs of mitigation vary widely depending on methodologies and assumptions, but increase with the stringency of mitigation. Scenarios in which all countries of the world begin mitigation immediately, in which there is a single global carbon price, and in which all key technologies are available, have been used as a cost-effective benchmark for estimating macro-economic mitigation costs.

Mitigation scenarios reaching about 450 or 500 ppm CO2 equivalent by 2100 show reduced costs for achieving air quality and energy security objectives, with significant co-benefits for human health, ecosystem impacts, and sufficiency of resources and resilience of the energy system.

Practical Approach

1 Cost-effectiveness

Equal Marginal Abatement Cost

2 Equitability

Regional emission pathways

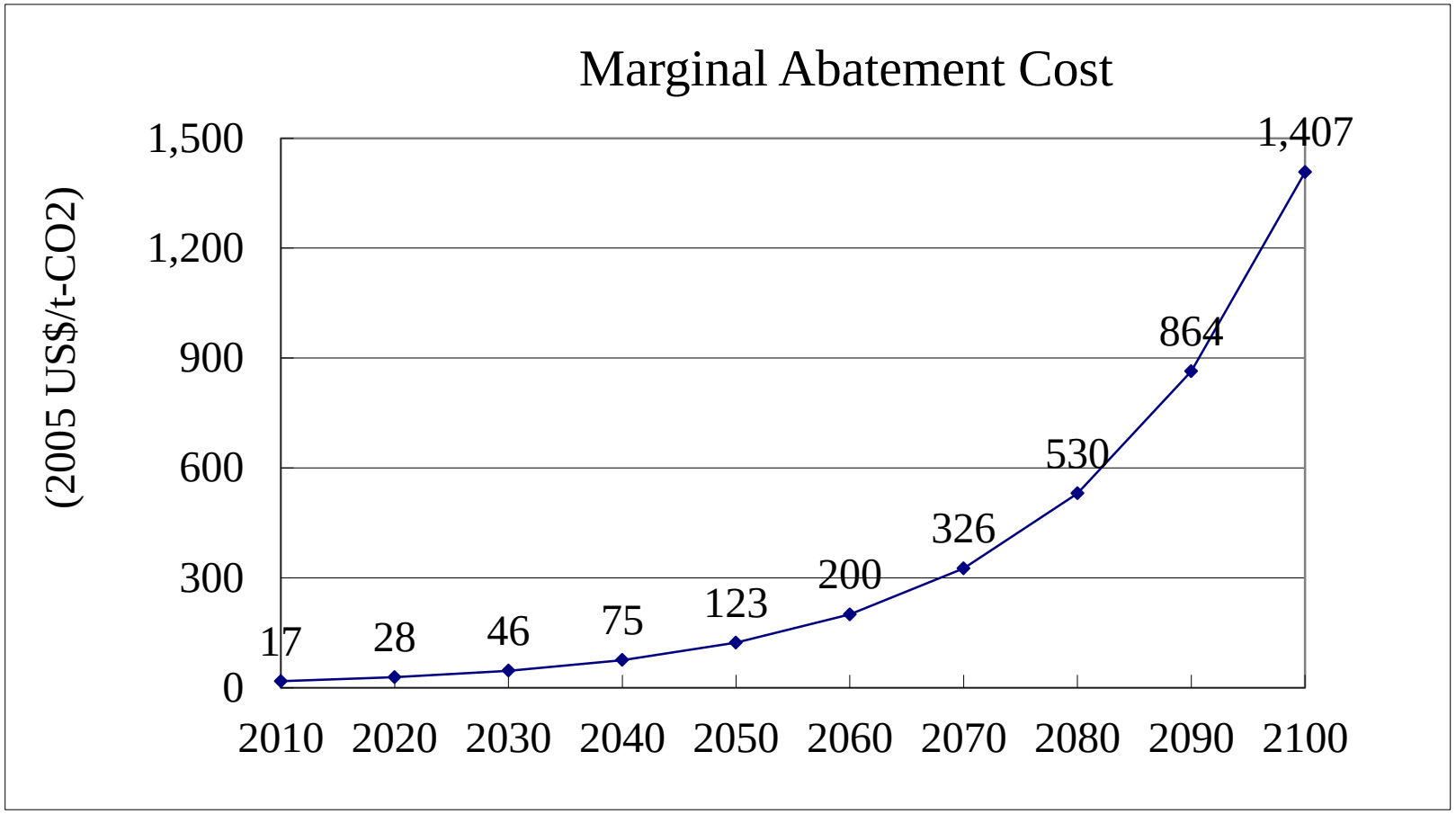
Regional total cost

3 domestic effort and international cooperation

Comparison between national targets and international vision

Hybrid approach

Equal Marginal Abatement Cost



Economic assessment of global optimization

Comparison between cumulative additional investment and energy saving benefit within 2010–50（Trillion USD）

		Add. Invest.	Energy saving	Total benefit
Global optimization	World	11	14	3
	A1	4	5	1
	Non A1	7	9	2
80% reduction in industrialized countries	World	42	10	−32
	A1	37	10	−27
	Non A1	5	0	−5

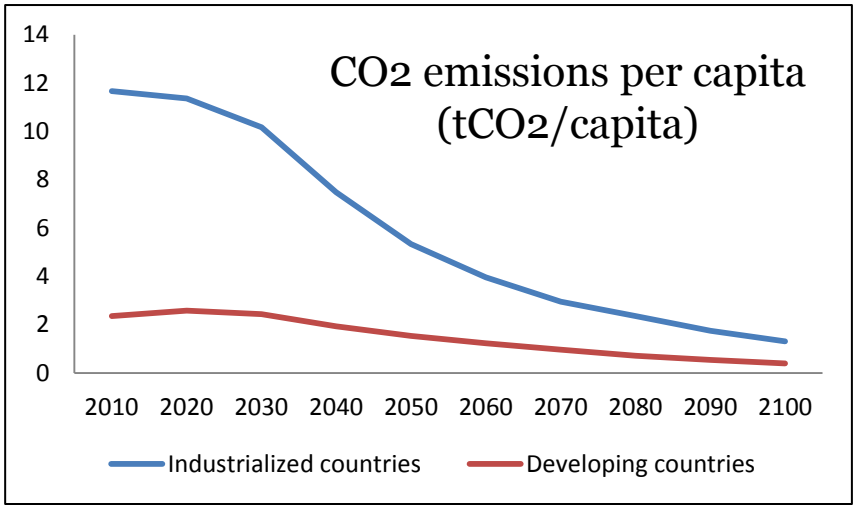
Regional Equitability

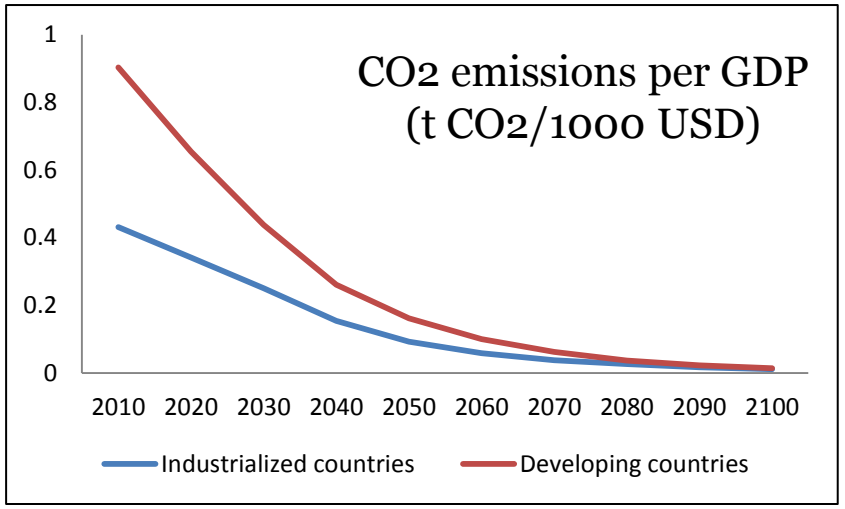
Emission levels according to economic levels

Ratio to 2005 levels	CO_2 Emissions		CO_2 Emissions per capita	
	2030	2050	2030	2050
World	1.20	0.75	0.94	0.53
Industrialized countries	0.95	0.48	0.89	0.47
USA	0.96	0.47	0.79	0.35
EU15	0.86	0.45	0.82	0.43
Japan	0.79	0.47	0.87	0.63
Developing countries	1.54	1.12	1.18	0.74
China	1.48	0.82	1.34	0.77
India	1.91	1.57	1.43	1.08
ASEAN	1.64	1.50	1.24	1.00

Regional Equitability

Low Carbon Index





Regional Equitability

Comparison of the regional cost (2010-2050, Billion USD)

	USA	WEU	JPN	CHN	SEA	IND
Additional Investment	1.29	0.75	0.15	1.28	0.77	0.80
Cost/GDP	0.14%	0.11%	0.05%	0.20%	0.29%	0.49%

Regional Equitability

Regional Economic Impacts（GDP Loss）

		USA	WEU	JPN	CHN	SEA	IND
GDP Loss (%)	2030	0.411	0.273	0.362	0.821	0.619	0.604
	2050	1.038	0.678	0.883	1.999	1.461	1.412

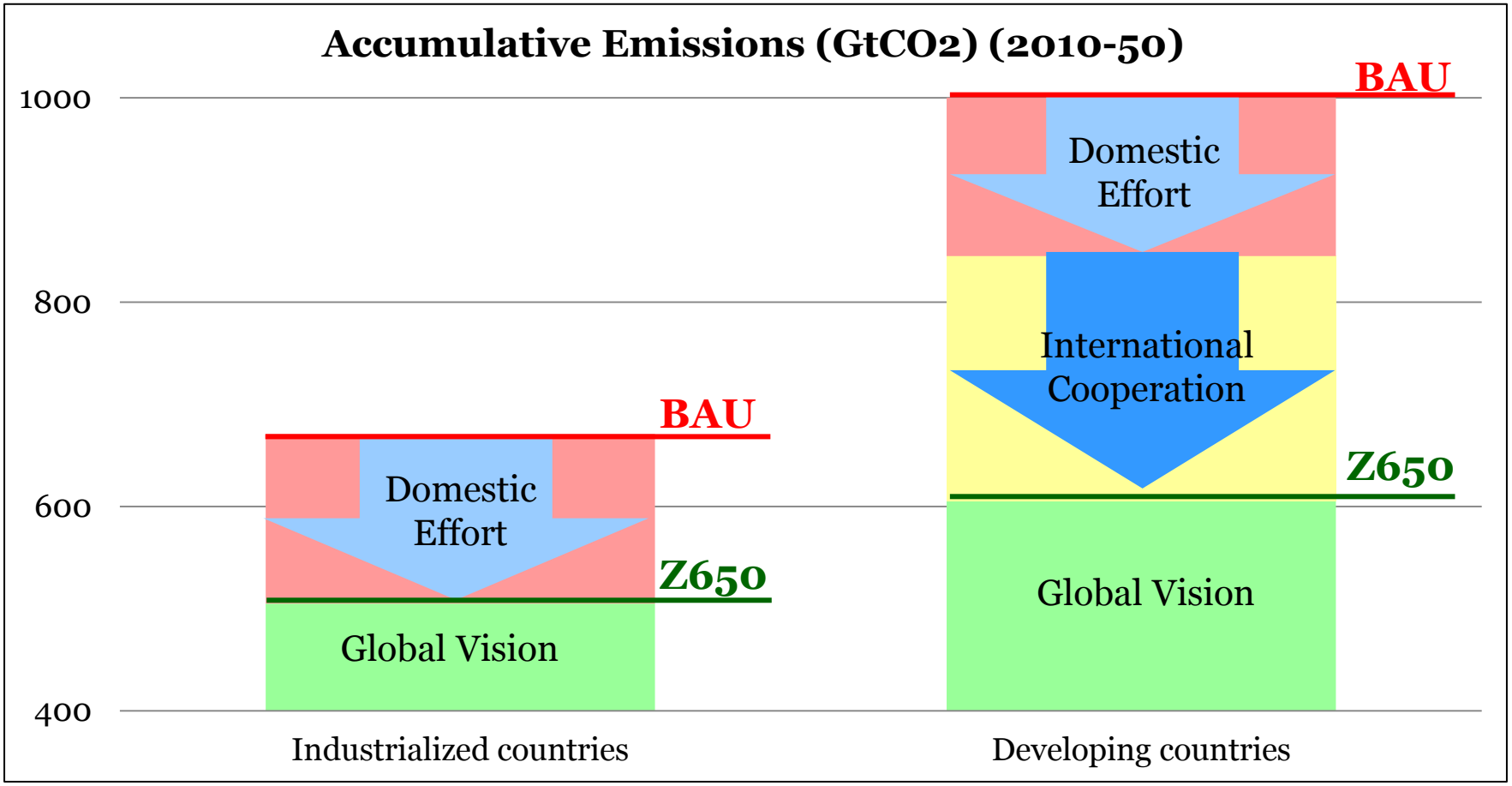
DICE/RICE(Managi, Hatase, 2013)

Comparison with regional targets

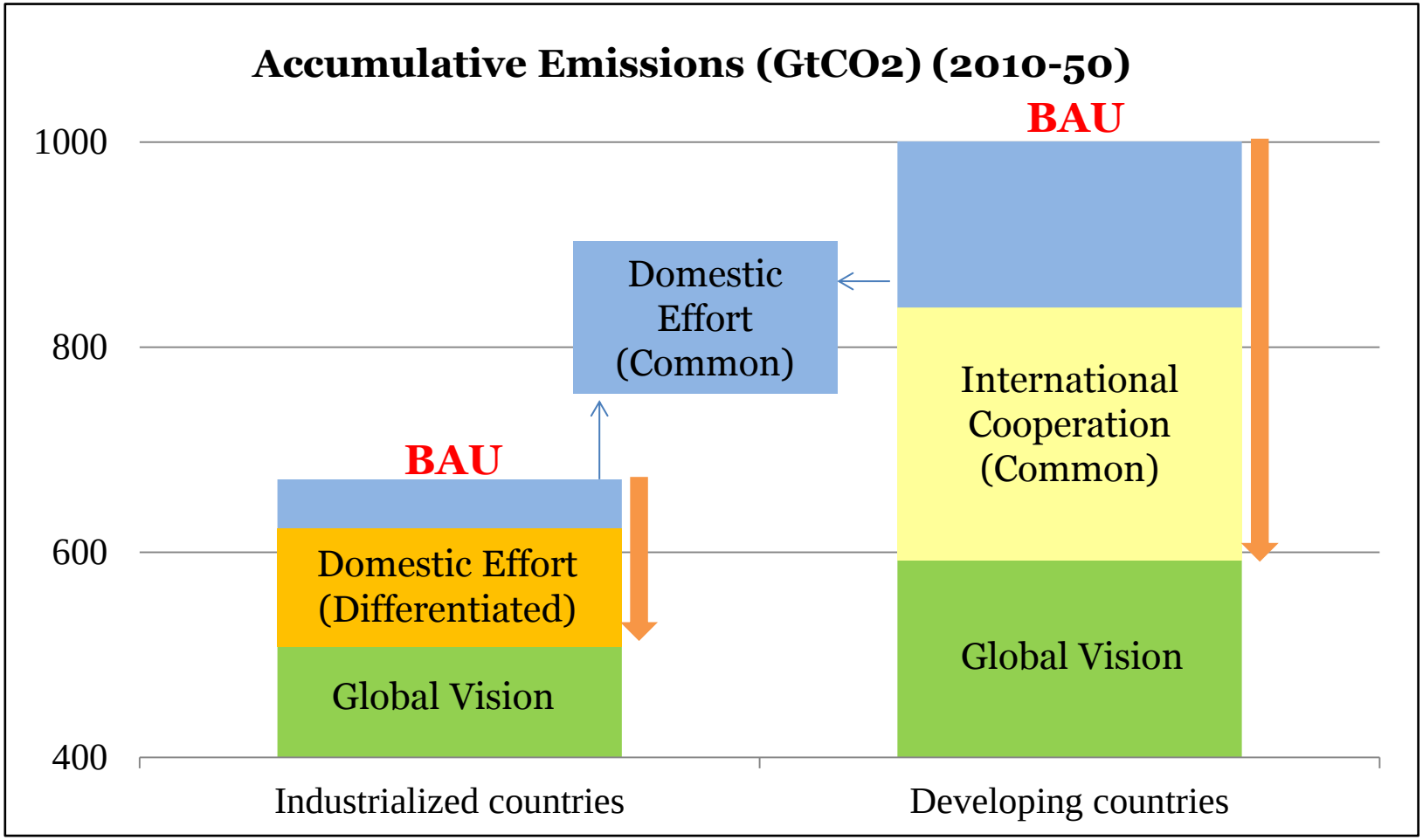
Ratios to 2005 levels		2005	2030	2050
REF	World	1.0	1.5	1.6
Z650	World	1.0	1.2	0.75
	Industrialized countries	1.0	1.0	0.5
	US		1.0 (0.8)	0.5 (0.4)
	EU15		0.9	0.4 (0.5)
	Japan		0.8 (0.6)	0.5 (0.2)
	Developing countries	1.0	1.5	1.1
	China		1.5 (2.1)	0.8 (2.3)
	India		1.9 (2.7)	1.6 (4.1)

Combination of bottom up and top down

Hybrid Approach

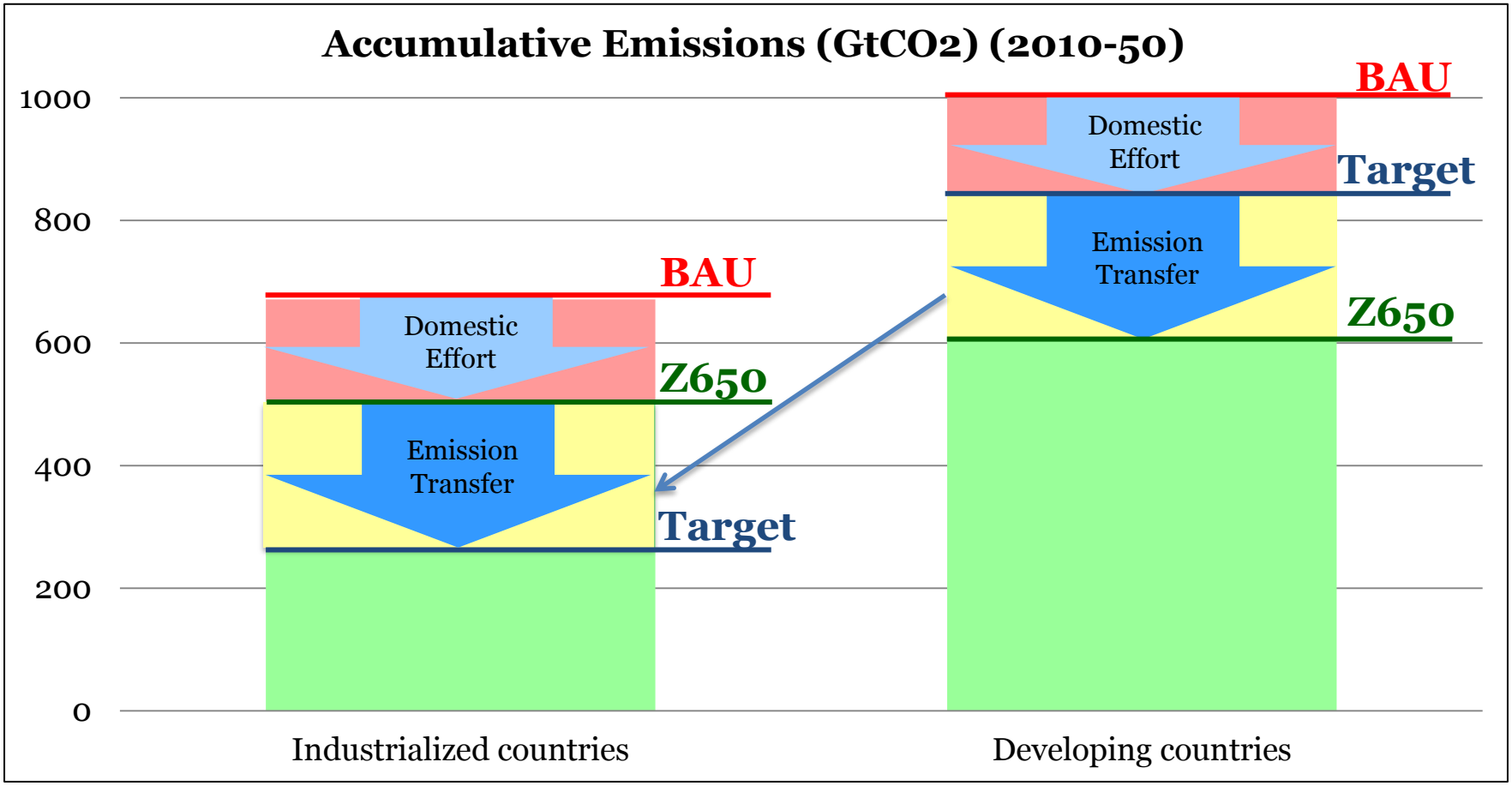


Hybrid vs. UNFCCC CBDR



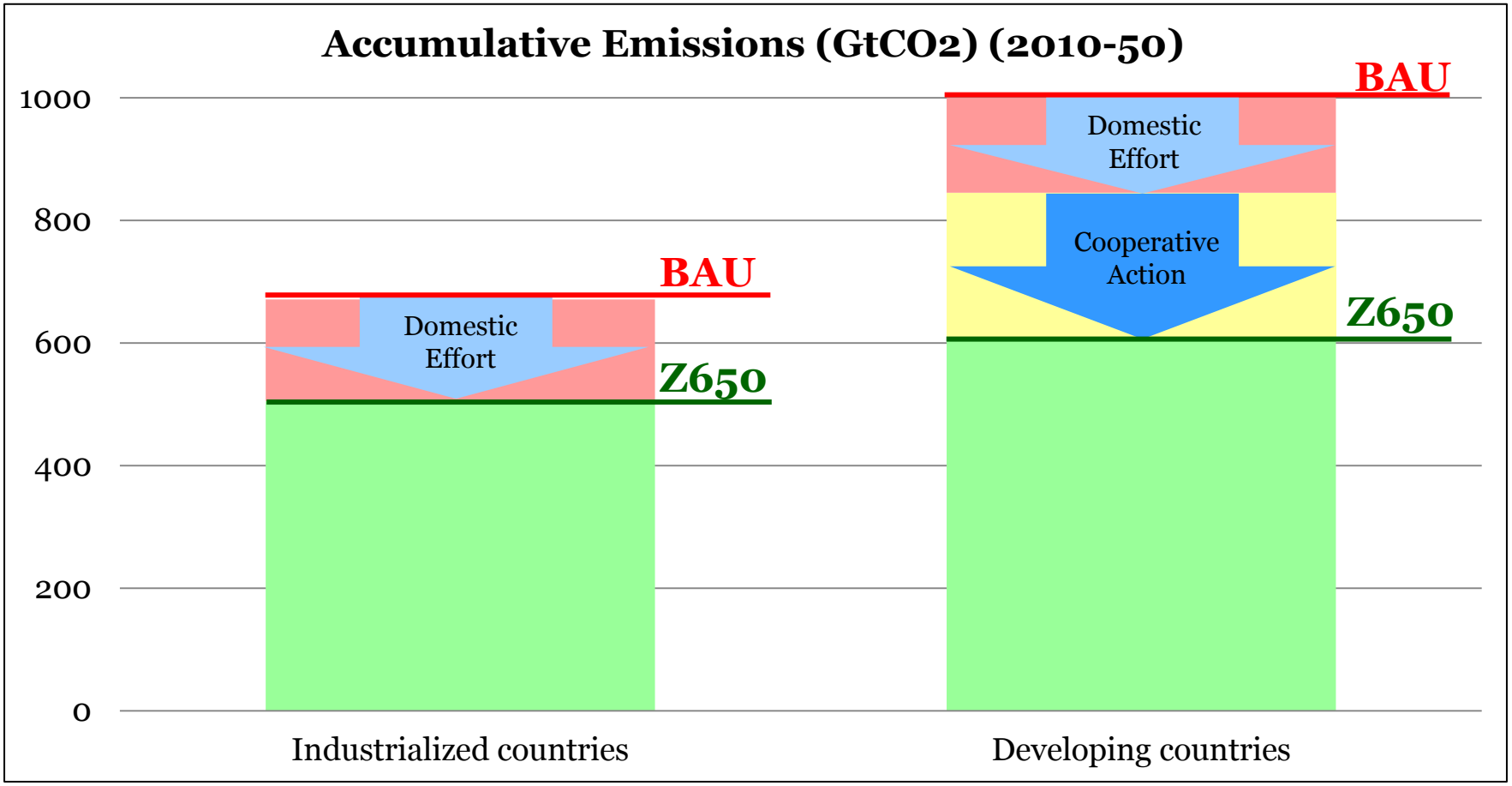
Approach of international cooperation

Based on Kyoto Mechanism



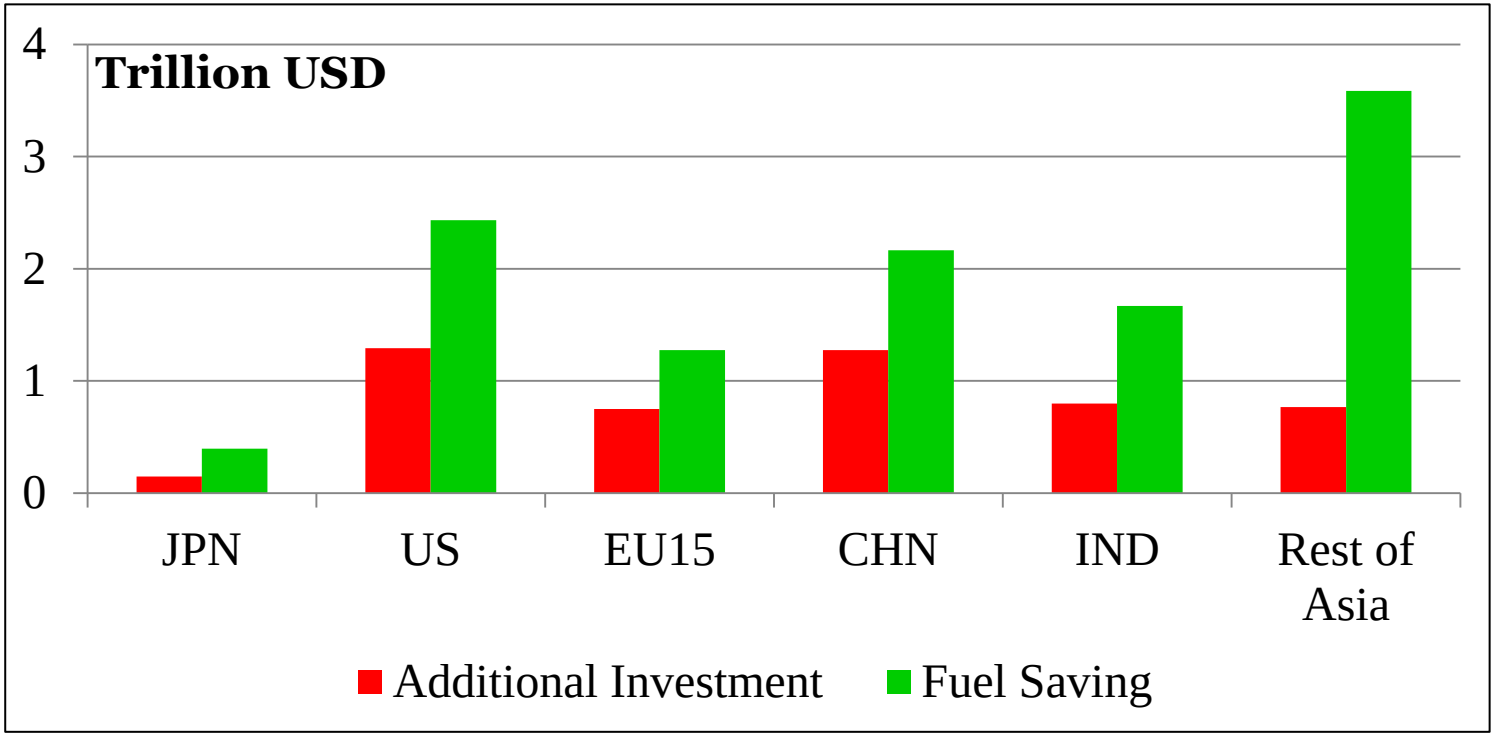
Approach of international cooperation

Based on Technology Cooperation



Possibility

Economic performance of mitigation Action

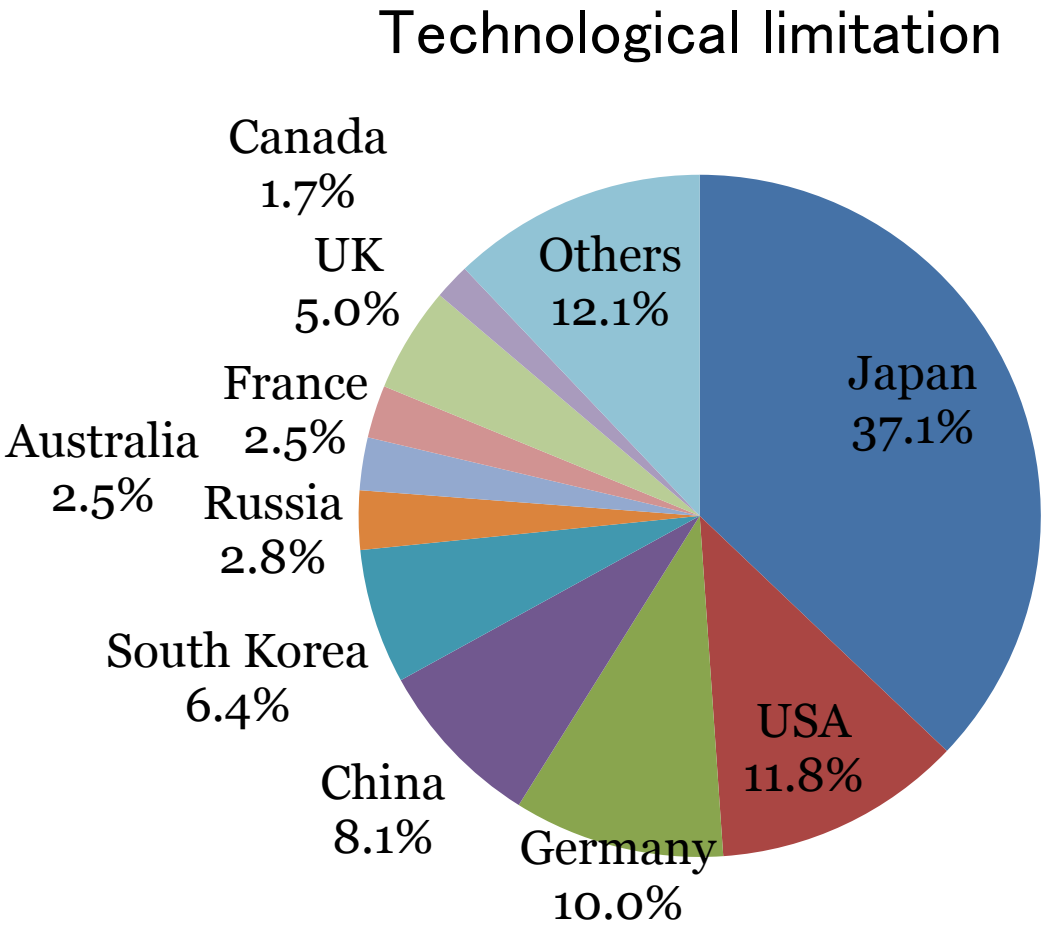


Limitation of Local Effort

Economic limitation

		USA	WEU	JPN	CHN	SEA	IND
Cost/GDP（GRAPEモデル）		0.14%	0.11%	0.05%	0.20%	0.29%	0.49%
GDP Loss (%)（RICEモデル）	2030	0.411	0.273	0.362	0.821	0.619	0.604
	2050	1.038	0.678	0.883	1.999	1.461	1.412

Limitation of Local Effort



世界低炭素技術発明分布（2000-05）
(A. Dechezlepretre, et al., 2009)

Technology Cooperation

To undertake business usual activity in developing countries with high reduction potential through combining technology and loan

To develop practical model by countries with capacities of finance, technology, human resource

Low Carbon Society, Climate Change Mitigation

Issues for discussion

1. Awareness on the impact of climate change
2. Scientific emission scenario of the temperature target
3. Practical approach to realize the scenario
4. Technological feasibility and deployment

Issues for discussion

1 Awareness on the impact of climate change

→ the importance and necessity of mitigation towards a near 2℃ target

2 Scientific emission scenario of the temperature target

→ moderate reduction scenario like Z650

3 Practical approach to realize the scenario

→ cost-effective approach and international cooperation

4 Technological feasibility and deployment