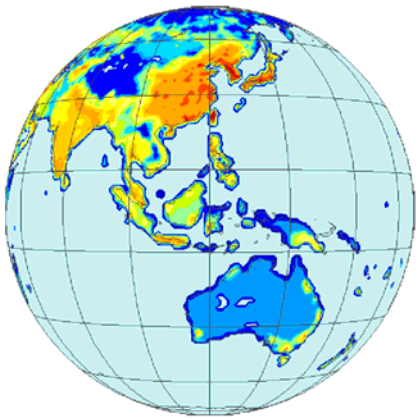
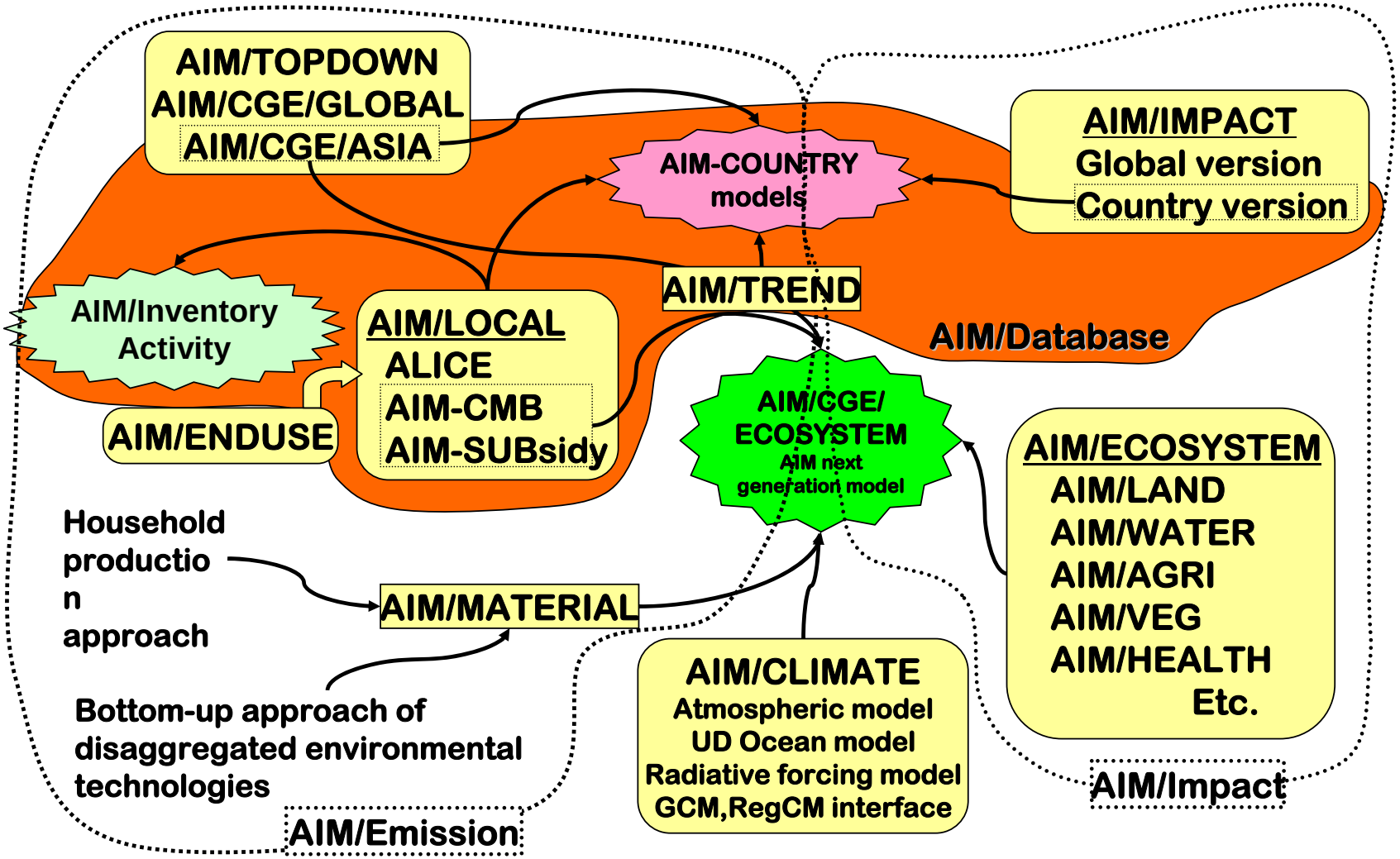


The 11th AIM International Workshop
19-21 February 2006
NIES, Tsukuba, Japan

Recent Development of AIM Models and Activities

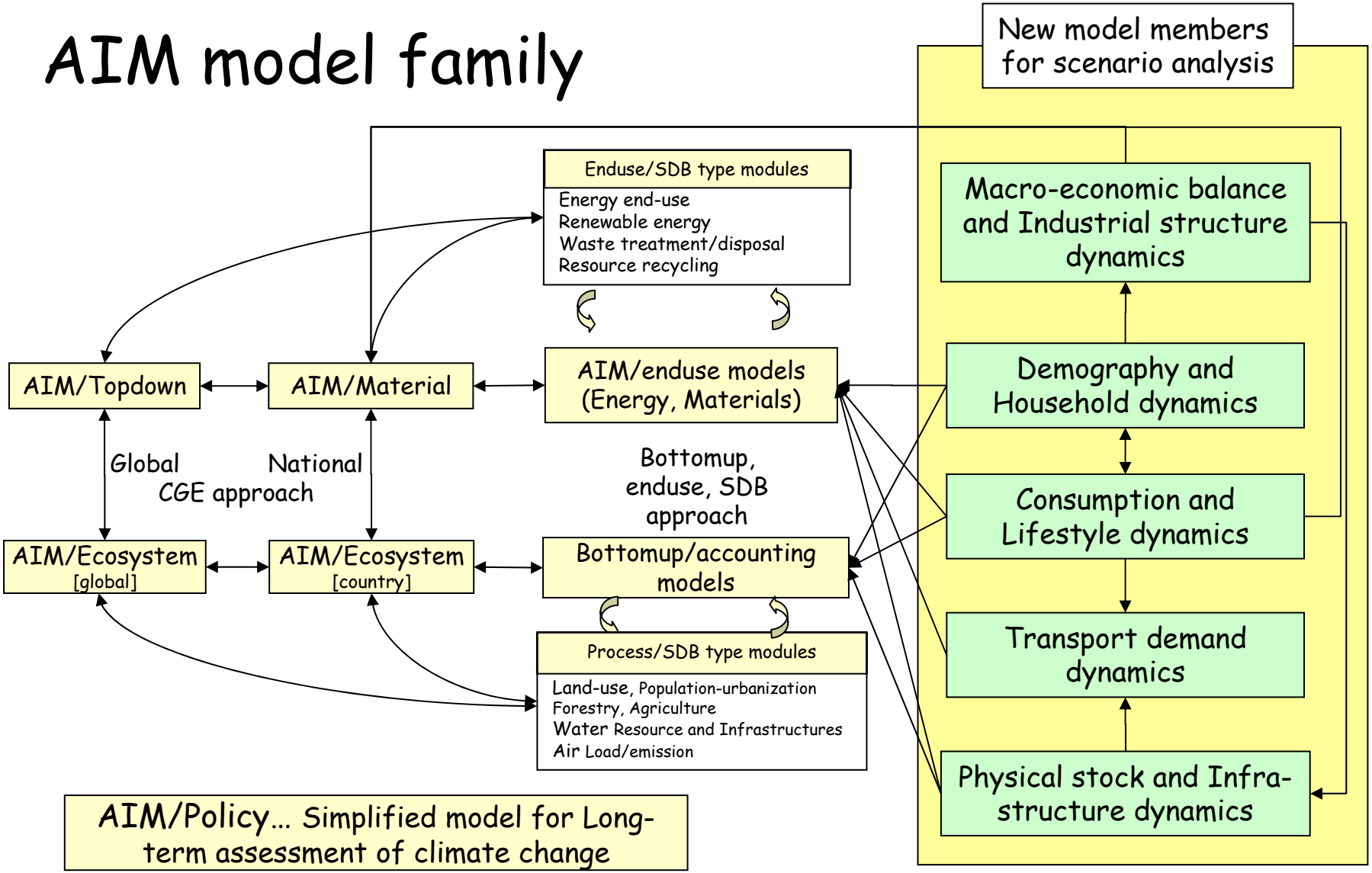
Mikiko Kainuma

National Institute for Environmental Studies



Roadmap of the AIM family

AIM model family



AIM: Asia-Pacific Integrated Model

Outline of AIM model presentation at the workshop

- Impact modeling [Session II & III]
- Emission inventory and modeling [Session IV, V & VII]
- AIM/Enduse[Global] [Session VI]
- APEIS project [Session VIII & IX]
- Low carbon society project [Session X & XI]
- Future direction [Session XII & XIII]

Development of AIM Model

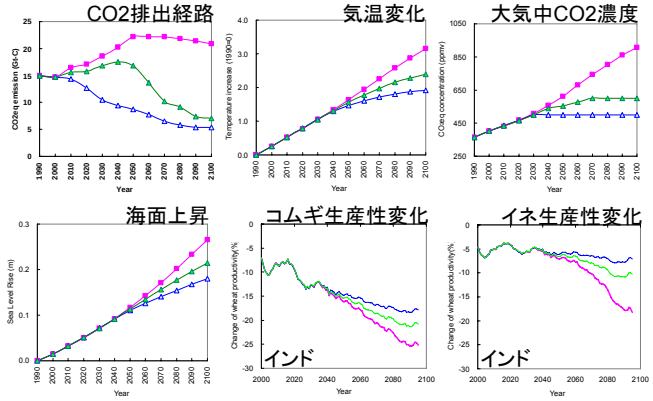
Model development

- Country models & global model
- Climate policy & other environmental policies

Model applications

- EMF: BC, land use, ...
- IPCC: database, new scenario ➜ Morita memorial
- IMCP: technology
- UNEP/GEO4: sustainable development
- Others: GHG stabilization and burden sharing, marginal abatement cost, carbon tax in Japan, ...

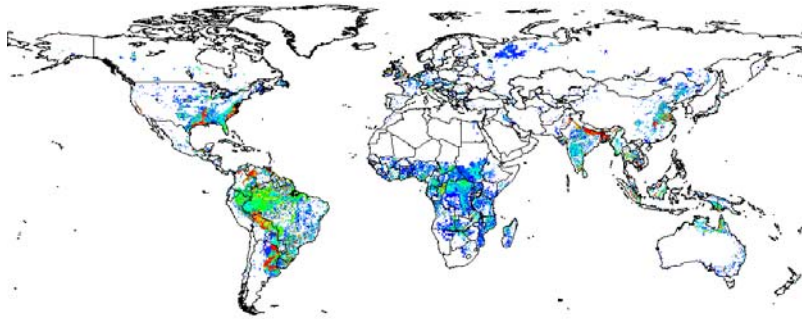
（1）Comprehensive assessment of climate change impact for discussing long-term stabilization target



■ SRES-B2: Business as usual
▲ GHG-500ppmv: 500ppmv cap on total GHG concentrations
▲ GHG-600ppmv: 600ppmv cap on total GHG concentrations
➢To achieve around 2℃ temperature increase in 2100, 550ppmv cap on total GHG constraint is needed

Optimal emission path for achieving 2 degC target and consequent temperature change, SLR and crop impacts.

（2）Impact assessment considering effects of extreme climate events



Climate change impact on crop productivity using daily climate scenario with high spatial resolution.

Application to the discussion of post-2012 framework

(Project S-3-2 and S-4)

Development of AIM/Ecosystem

(Project B-52)

Improvement of impact model

(Project B-12)

（3）Impact assessment considering interaction between climate change, other environmental problems, and development target.

Three main research activities of AIM impact study

Global Enduse & Inventory

Development of Global Enduse model

Regional scale: 21 Global regions
(however, improve data as detail as possible in a national level)
Temporal scale: 2000 – 2020 (plan to extend upto 2050)
Gas classifications: CO_2, CH_4, N_2O, CFC, HCFC, HFC, PFC, SF_6
(plan to include SO_2, NOx, PM, BC/OC)
Sector classifications: Energy industry, Industry, Transport, Residential, Commercial, Agriculture, F-gas emission

Development of Emission Inventory

1) Development of emission factor data of Black Carbon and its emission inventory in 2000 in Asia regions
2) Development of emission inventory in 2000 in China, India, Thailand, Vietnam, Indonesia
3) Development of emission inventory in 2000 in Asia regions and geographical informatization

Activities in APEIS

(Session VIII & IX)

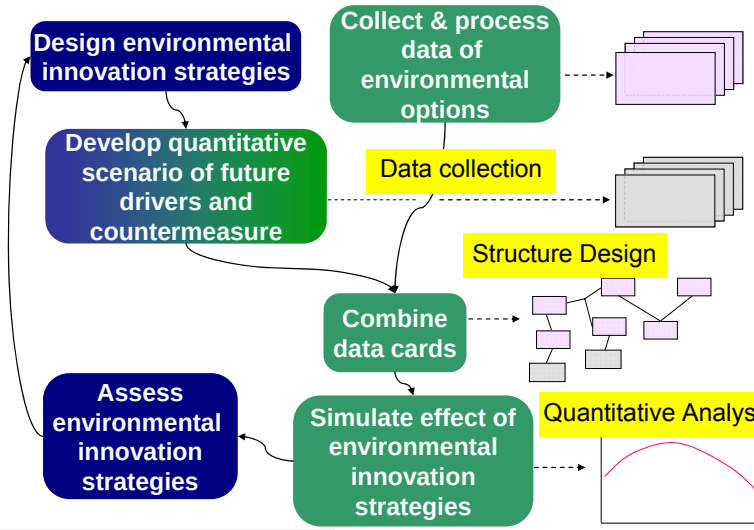
CGE model application

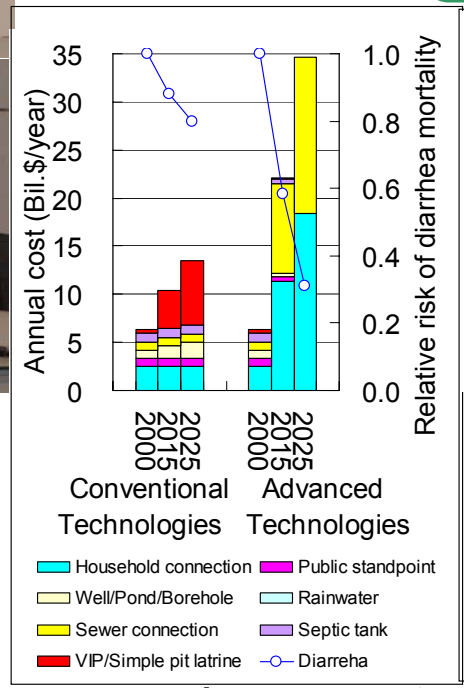


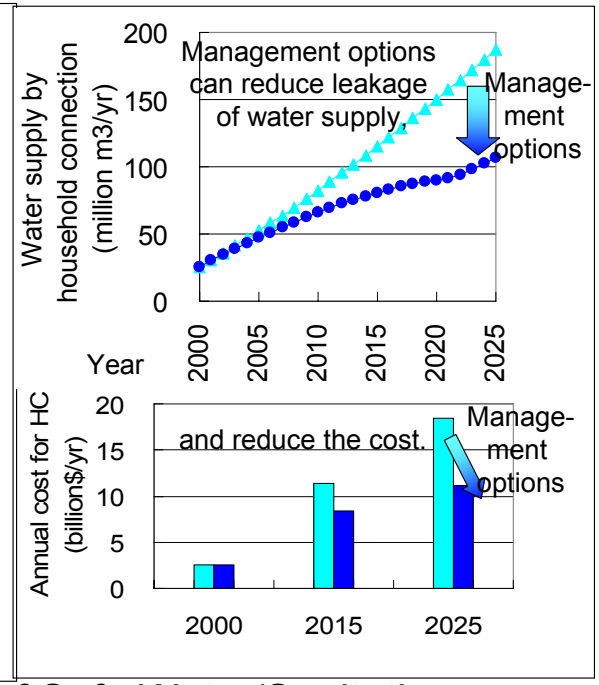


AIM/APEIS Training Workshop
(November, 2005)

SDB (Strategic DataBase)



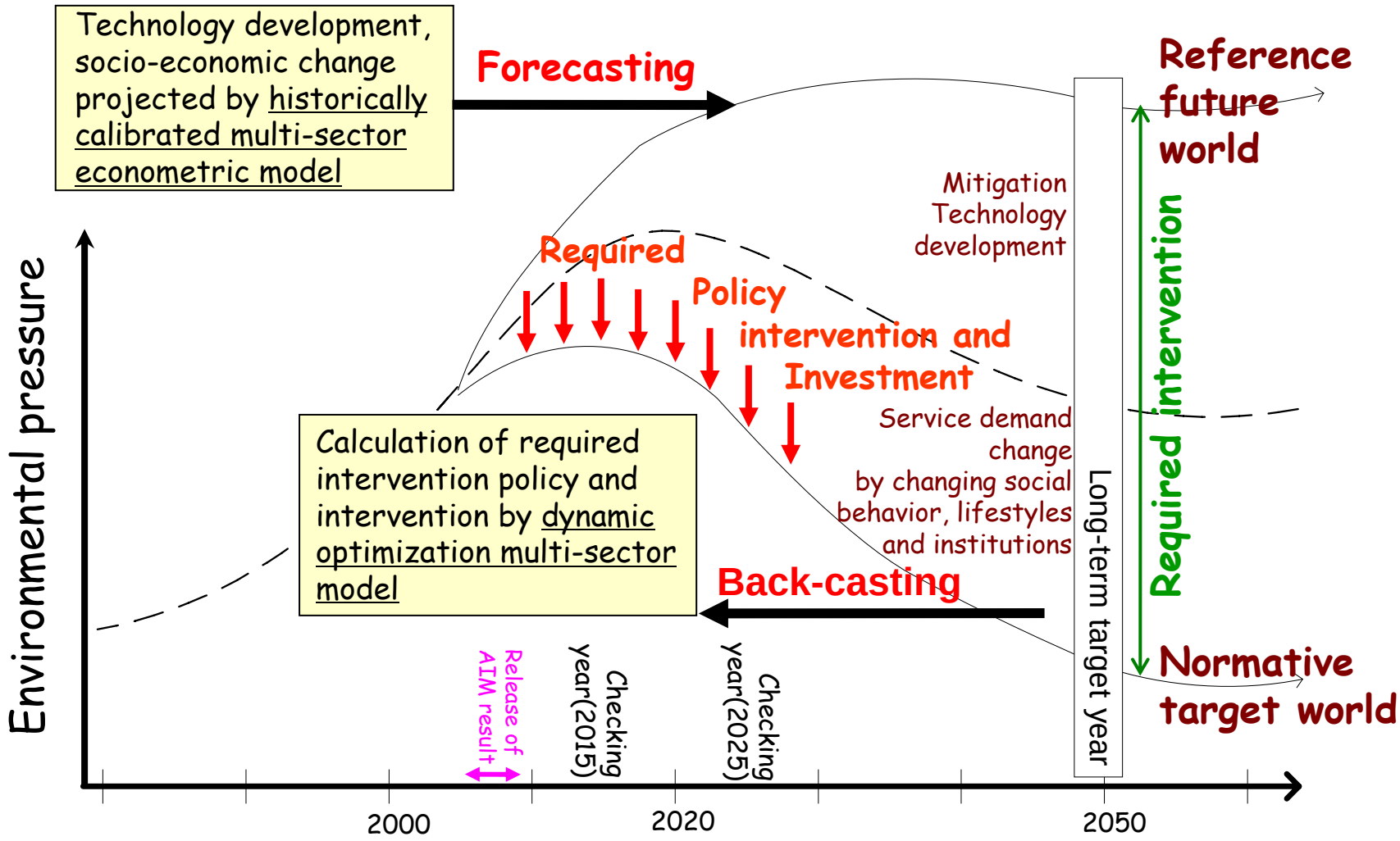




Assessment of Safe Water/Sanitation Technologies and Management Options
- India's case using SDB -

Research project on Japan Low-carbon society scenario

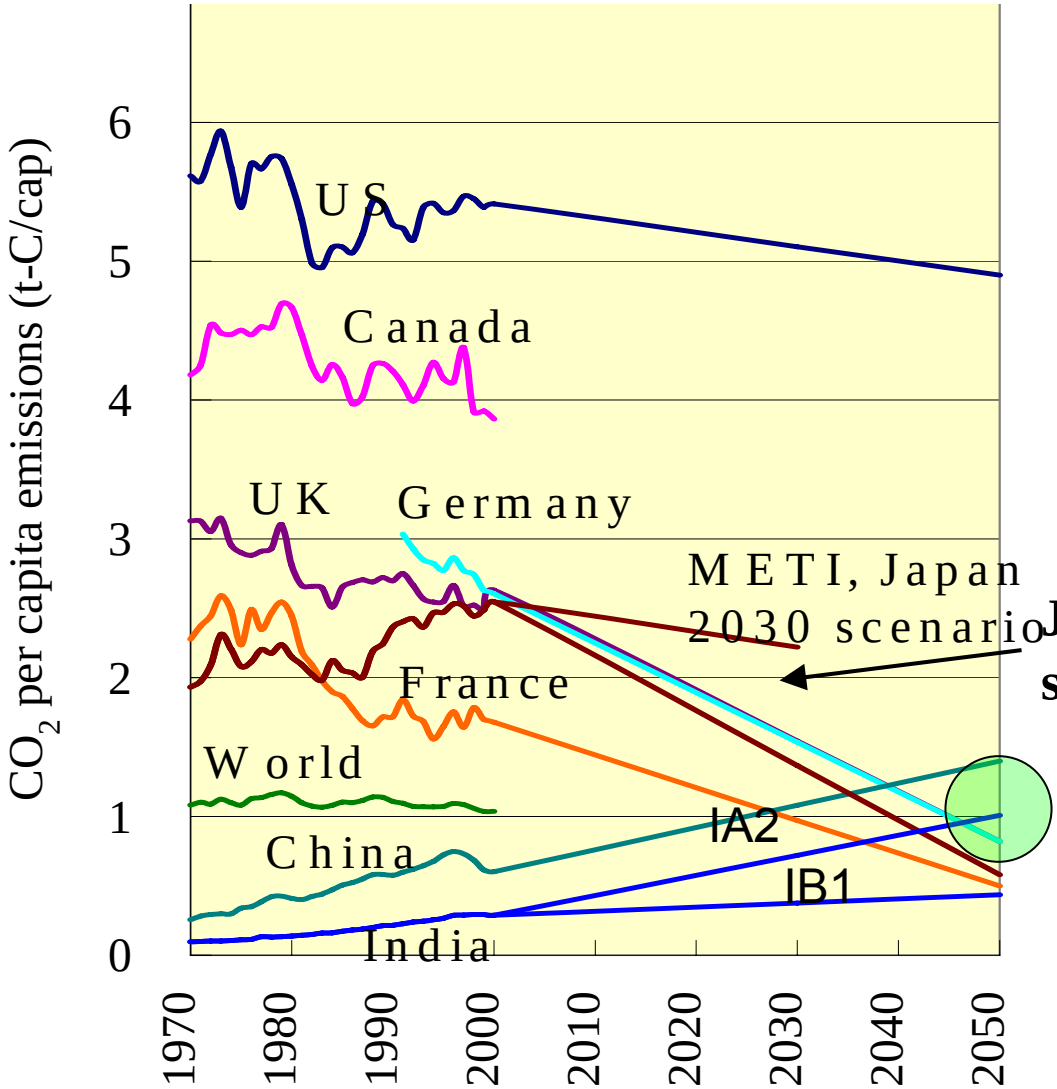
Back-casting from future target world by the macro-economy and industry structure dynamics model



NIES COP11 and COP/MOP1 side event, Montreal, Dec.3, 2005

Global Challenges Toward Low-Carbon Economy (LCE)

-Focus on Country-Specific Scenario Analysis-



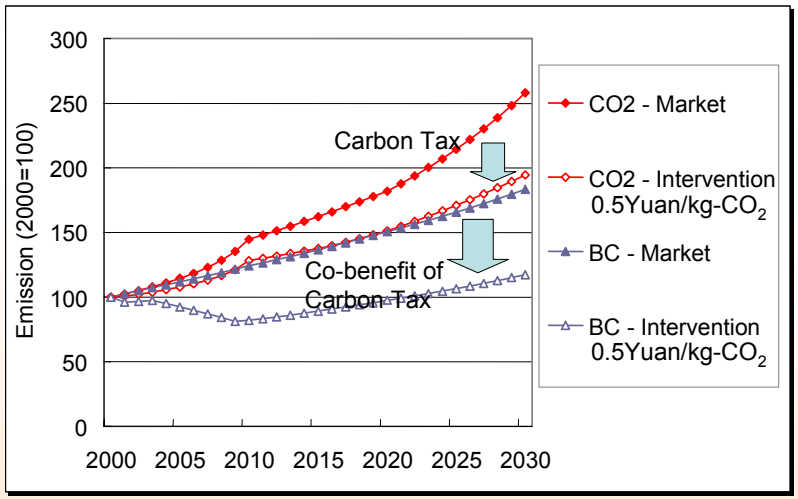
Current per capita CO_2 emissions and Target

International Cooperation

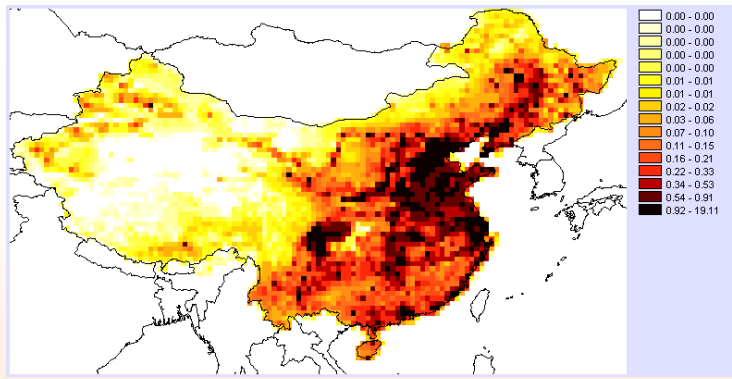
- **EMF 22 (Energy Modeling Forum)**

Preliminary Analysis on BC/OC Model using AIM

Emission profile in China



BC Emission Distribution in China



kt-BC/(0.5Degree)^2

Emissions Scenarios Database for the IPCC Fourth Assessment Report

Scenarios of interest: **New mitigation scenarios since TAR**
Regional scale: **Global, regional and national level analysis**
Temporal scale: **Scenarios with horizons beyond 2030**
Gas classifications: **all anthropogenic GHGs**

CO_2, CH_4, N_2O, CFCs, HCFCs, HFCs, PFCs, SF_6, CO, NMVOC, SOx, NOx and Black Carbon etc

Sector classifications: **Multi-sector scenarios**

Geographical coverage	Data source	Scenarios
Multiregional global scenario	47	236
Single global scenario	13	60
Single & multinational regional scenario	4	18
National scenario	25	104

"Greenhouse Gas Emissions Scenarios Database and Regional Mitigation Analysis", *CGER Research Report* (CGER-D038-2006), NIES

International Cooperation

◆ **IMCP (Innovation Modeling Comparison Program)**

Steering Committee :Imperial College in Cambridge Univ.,
Tyndall Center in Cambridge Univ.,
Potsdam Institute for Climate Impact Research (PIK),
German Institute of Economic Research (DIW)

Project period: 2004 (?) ~

Target regions: Global level analysis

Temporal scale: 2000 - 2100

Program: Mitigation scenarios of 550, 500, 450 CO2-only ppmv,
Comparison of with and without induced technology changes,
4 Key concerns (investment pathway, policy instruments,
international spillovers, impact of uncertainty)

Output: Energy Journal Special Issue

Models: WIAGEM, AIM, DEMETER-ICCS, MERGE-ETL, MIND,
DNE21+, GET-LEF, MESSAGE-MACRO, E3MG, IMACLIM-R,
FEEM-RICE, ENTICE, IMAGE/TIMER

International Cooperation

◆ **SEF-II (National Performance Assessment and Strategic Environment Framework for Greater Mekong Sub-region)**

Steering Committee: ADB / UNEP RRC.AP
Project period: 2003 FEB ~ 2006 MAR
Target regions: 6 Greater Mekong Sub-regions (GMS)
Program: 13 env. issues with Pressure-State-Response method
Output: Environmental Performance Assessment reports

◆ **CASCADE-MINTS-II (Case study Comparisons And Development of Energy Models for Integrated Technology Systems)**

Steering Committee : ECN / National Technical University of Athens
Project period: 2004 FEB ~
Target regions: Europe
Program: 5 packages (Baseline, Renewables, Nuclear, CCS, Trade-offs)
Output: A comparison analysis report in each work-package
Models: MARKAL Western Europe, PRIMES, Prometheus, NEMESIS, POLES, TIMES-EE, PACE, NEWAGE-W, MESSAGE, GMM, DNE21+, AIM

Thank you for your contribution!