Sixteenth Asia-Pacific Seminar on Climate Change
- Asia-Pacific Approach to Climate Friendly and Climate-resilient Society-
5-8 September 2006
Jakarta, Indonesia

Developing the Asia-Pacific with Climate Change Consideration Integrated

- Perspectives from 2050 Project and further -

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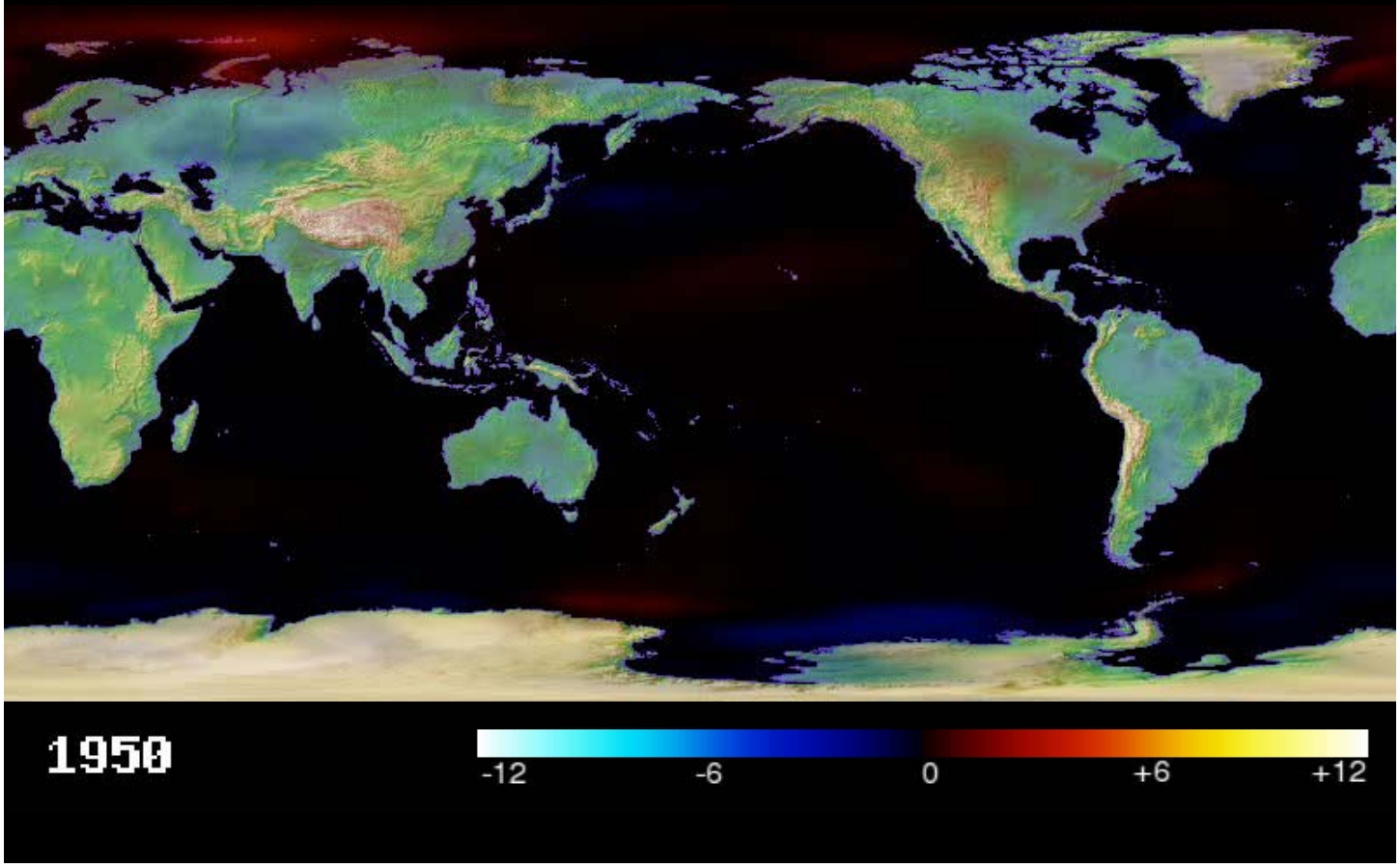
Why should “Development and Climate” actions be aligned?

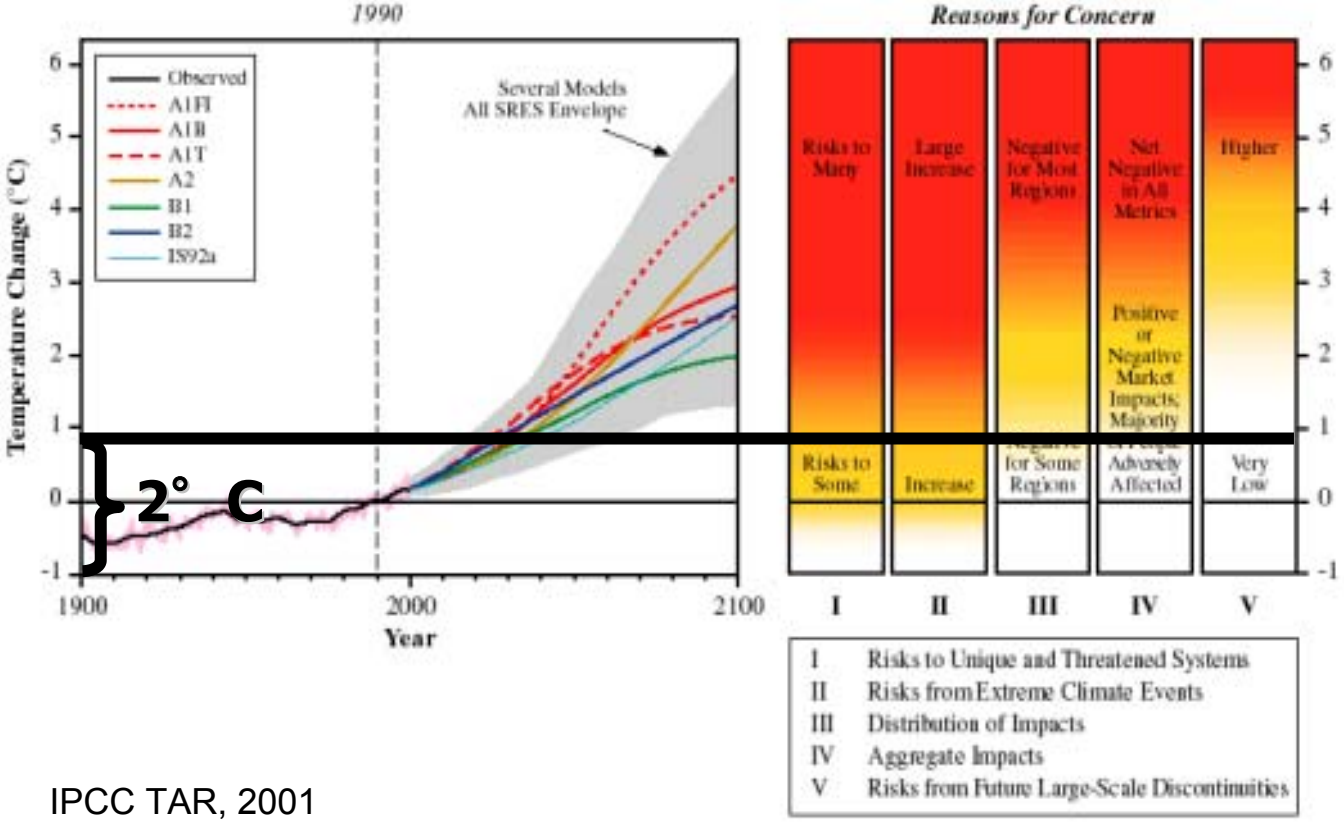
- Climate change is a derivative problem of development
- Development is the key to mitigative and adaptive capacities
- Dealing with climate change exclusively is very expensive & expected to cost several trillion dollars over this century
- Strategies for dealing with sustainable development and climate change have many common elements, and aligning

CCSR/NIES/FRCGC, Japan

Surface Air Temperature Change

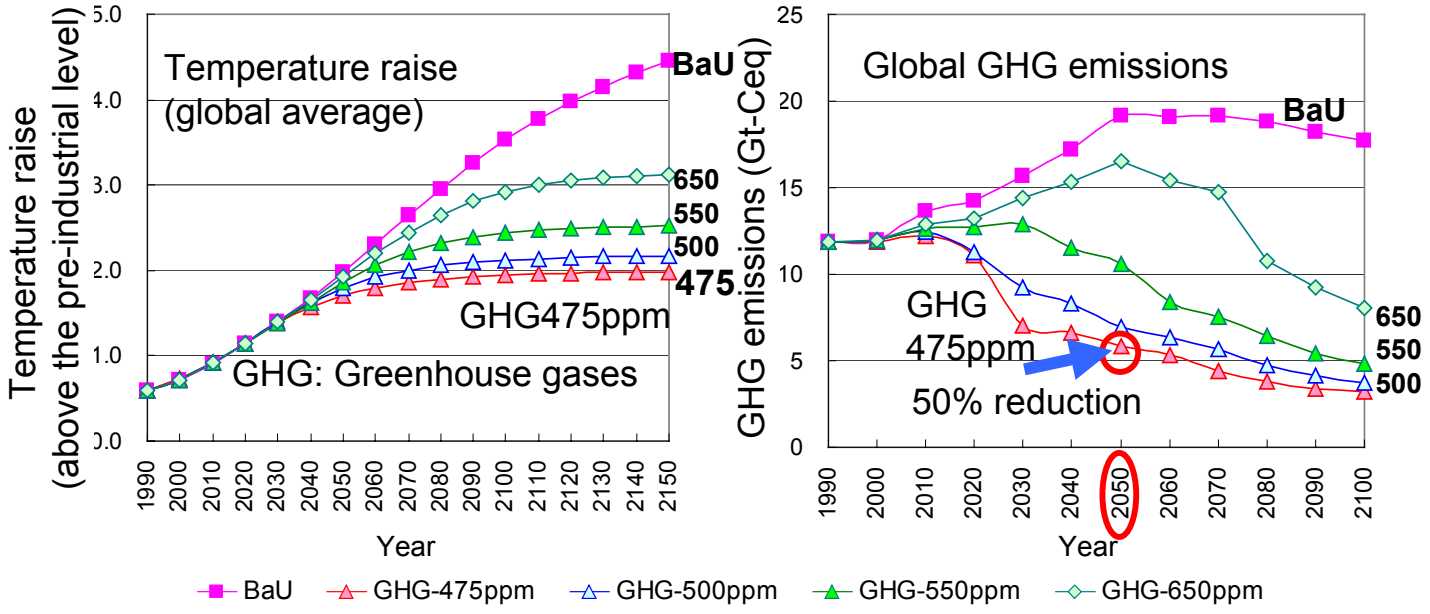


To avoid serious CC impacts, it is necessary to stabilize temperature raise below 2 degree compared with pre-industrialized level



IPCC TAR, 2001

Low Low-carbon societies are necessary to avoid dangerous climate change.



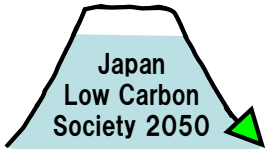
Relationship between human-induced GHG emissions, atmospheric GHG concentration, and increase in global mean temperature. (Calculated by AIM/Impact[policy] Model)

Objectives of project on Japan Low-carbon society scenario (the 2050 Project)

1. Understanding the necessity of drastic GHG emissions reduction toward 2050 based on scientific findings
2. Reviewing country-level GHG emissions scenario studies in the world
3. Sharing the image of Low Carbon Economy (LCE)
4. Finding the pathways to achieve country-level and globally harmonized LCE
5. Building international cooperation toward LCE

The 2050 Project

studied by 60 Japanese researchers



Green buildings
Self-sustained city
Decentralized services

Eco awareness
Effective communication
Dematerialization

Next generation vehicles
Efficient transportation system
Advanced logistics

Urban structure

ICT-Society

Transportation system

Industrial Structure

Technology

Institution

Management

3. Propose GHG policy to realize low-carbon society

Social system Reform to introduce countermeasures

Reduction target

2. Build visions of Japan Low-carbon society 2050

1.GHG Reduction Target Setting

GHG emissions

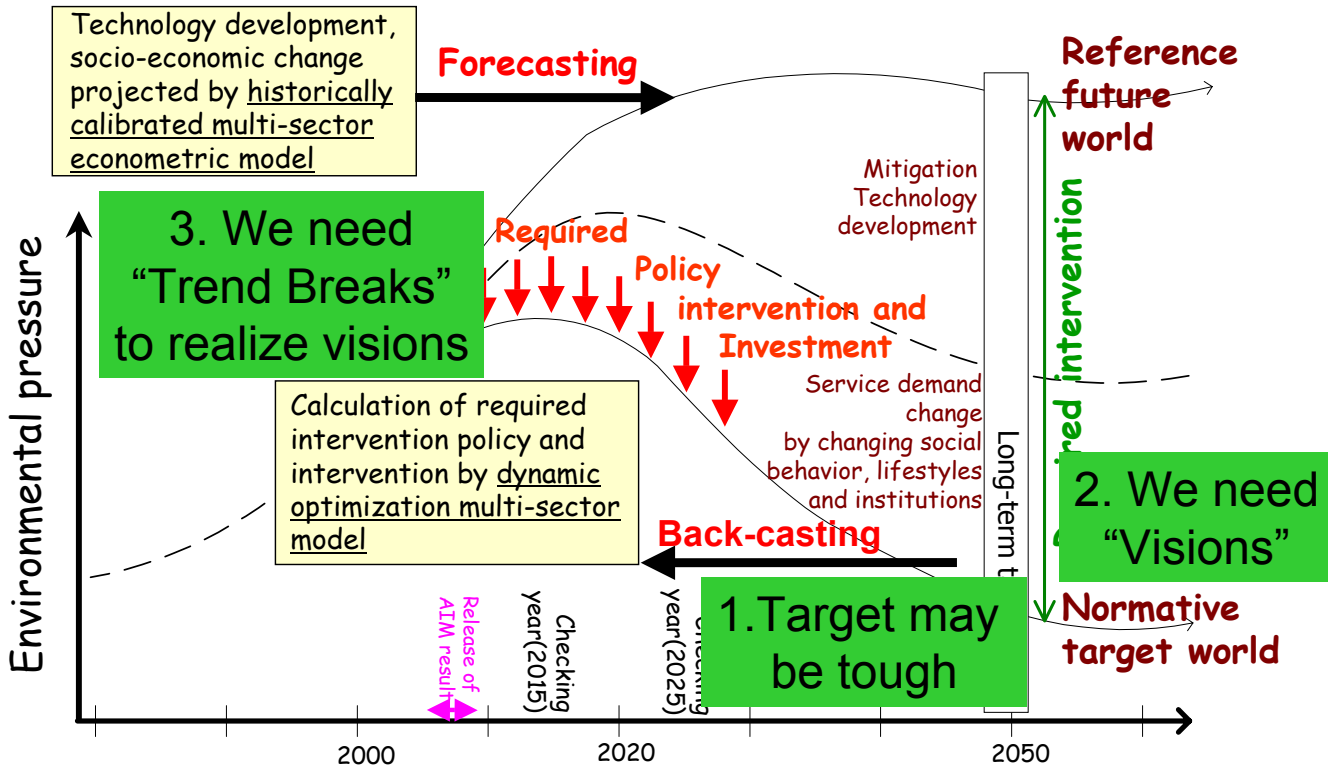
1990 2000 2008 2010 2012 2020 2030 2040 2050

Kyoto protocol

Most of current infrastructure rebuilt

[FY2004-2006(+2years), Global Environmental Research Program, MOEJ]

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



Depict “Japan Low carbon society 2050”

What kind of demands/services, Japanese needs in 2050? = Depict living and working style

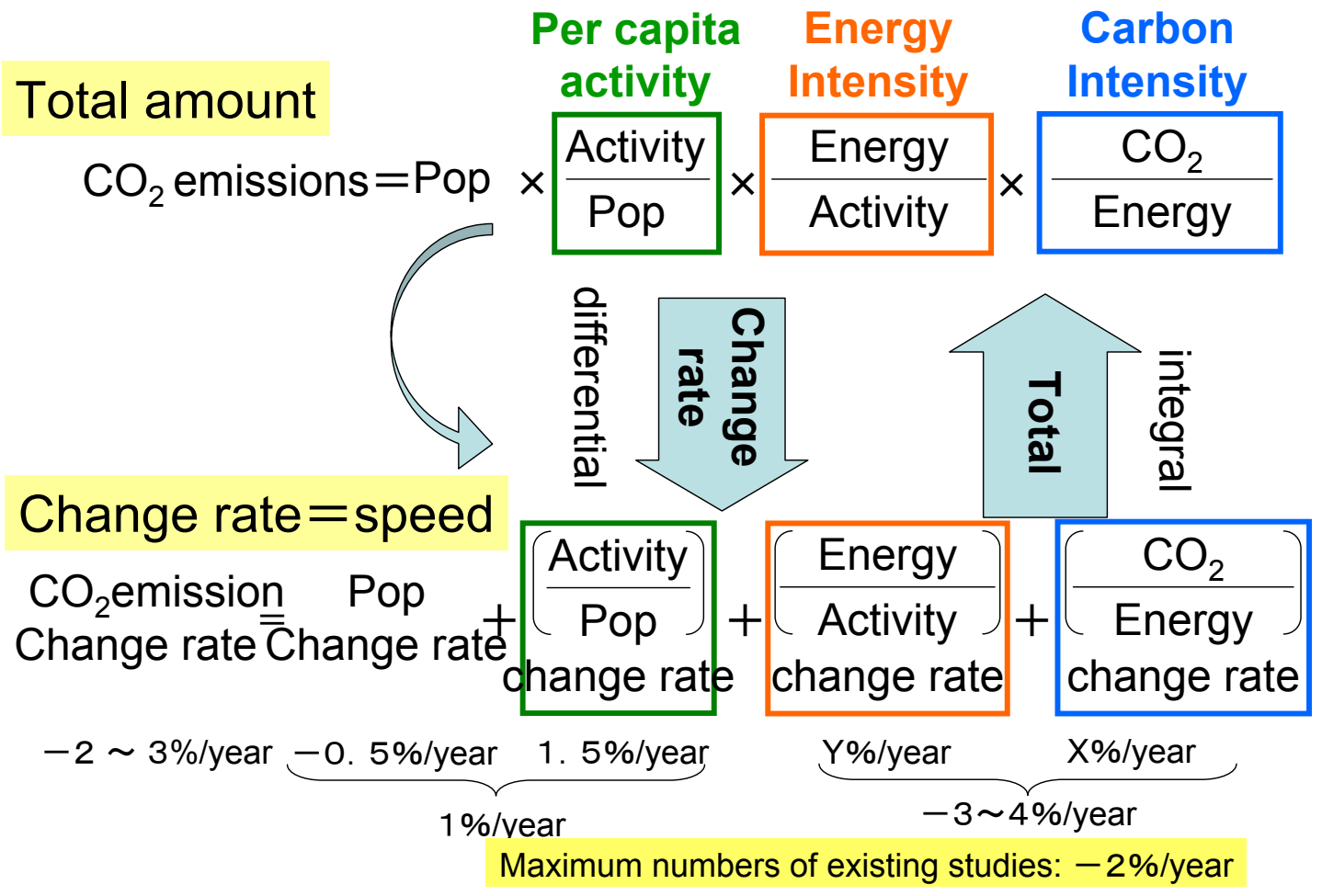
Desired future: The society allows wider range of choice

Scenario A: Vivid, Technology-driven	Scenario B: Slow, Natural-oriented
Urban/Personal	Decentralized/Community
Technology breakthrough Centralized production/recycle	Self-sufficient Produce locally, consume locally
Comfortable and Convenient	Social and Cultural Values

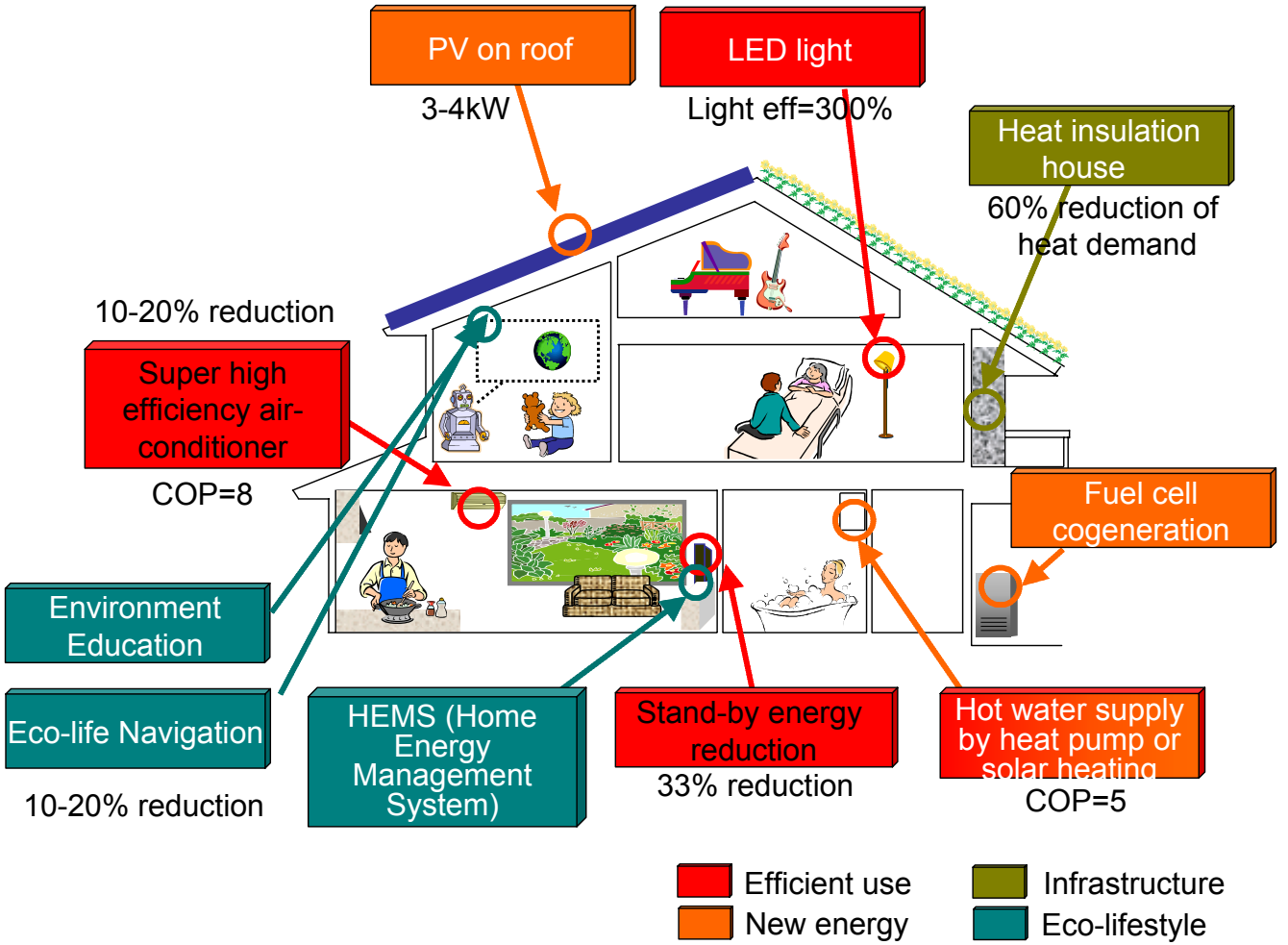
Considering global relationship, energy security, other environmental problems

We do research to depict various kinds of future qualitative and quantitative

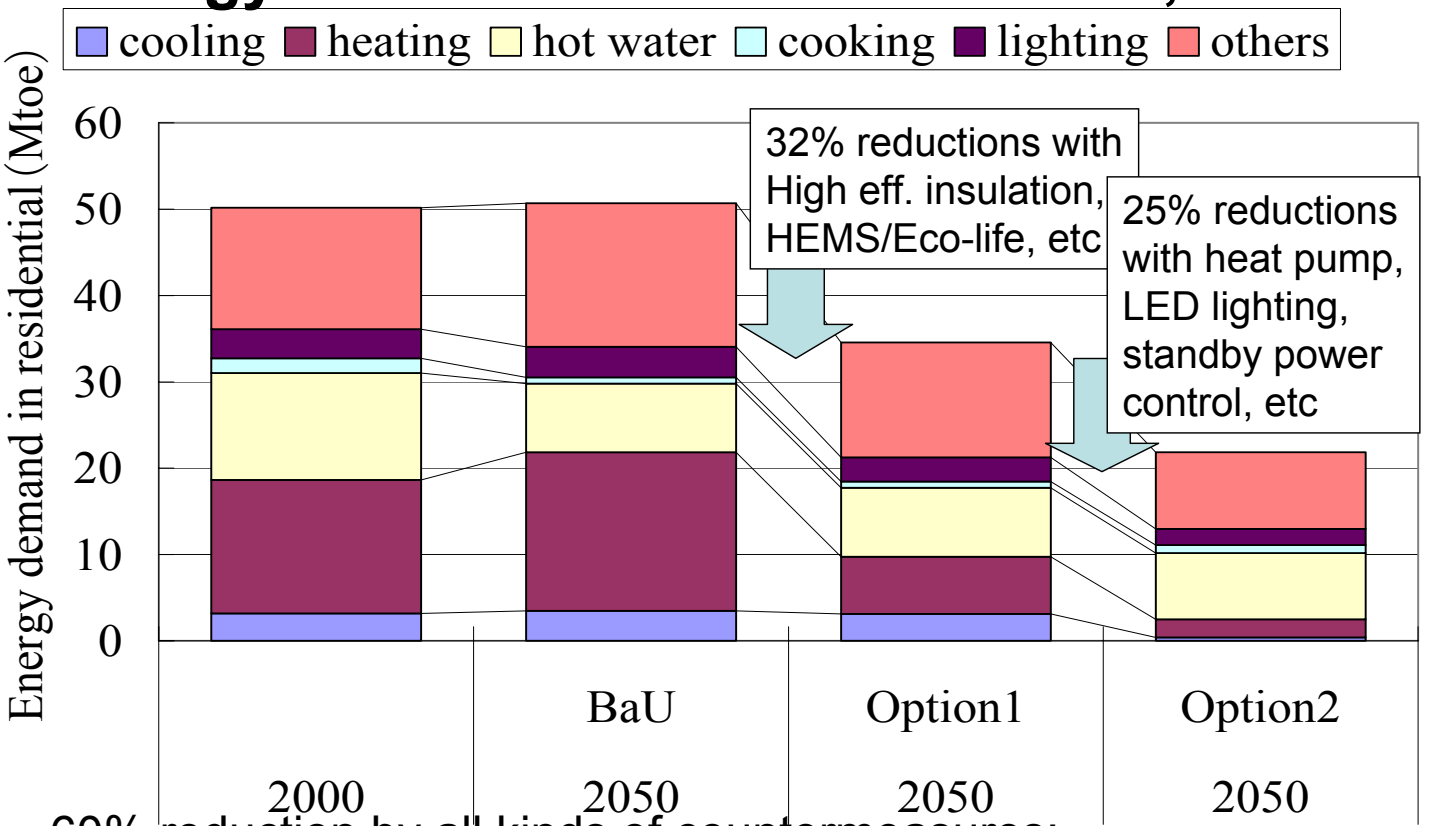
How fast GHG emissions should be reduced?



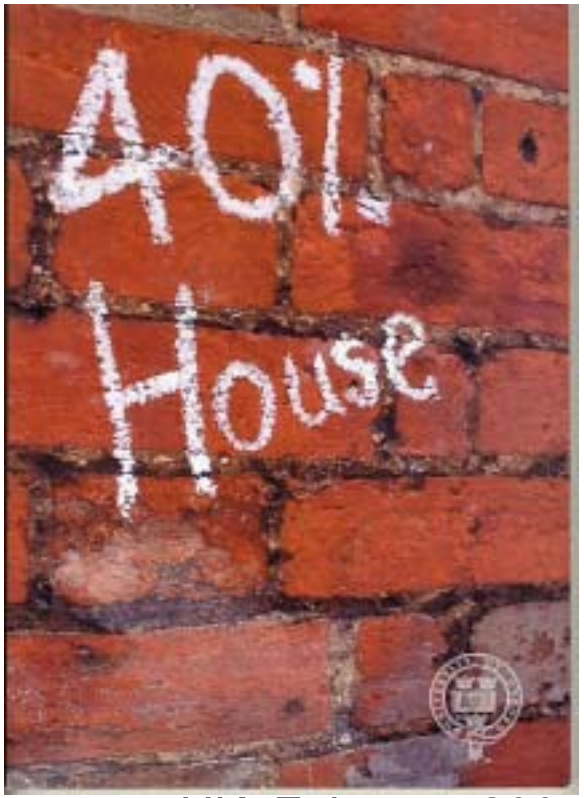
Depict Future Image: Residential sector in 2050



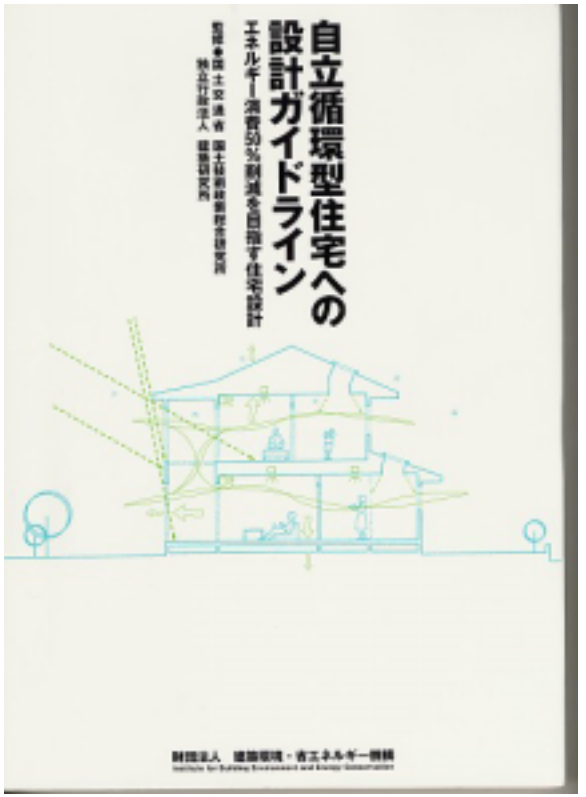
Energy demand in residential sector, 2050



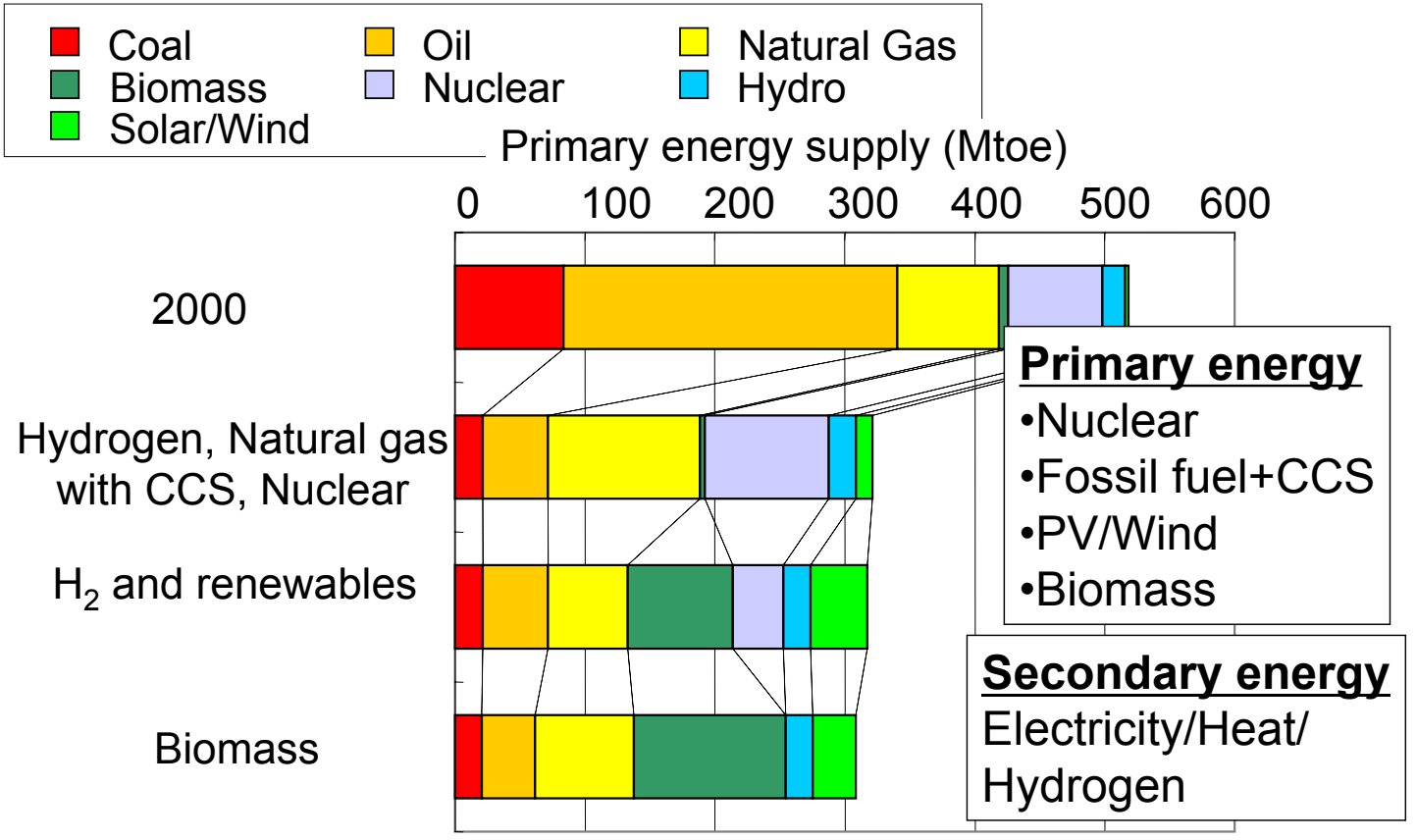
60% reduction by all kinds of countermeasures;
UK “40% House”, Japan “Guideline for designing of autonomous and low emission house” -> 50% reduction



UK, February 2005
“40% House”
60% reductions

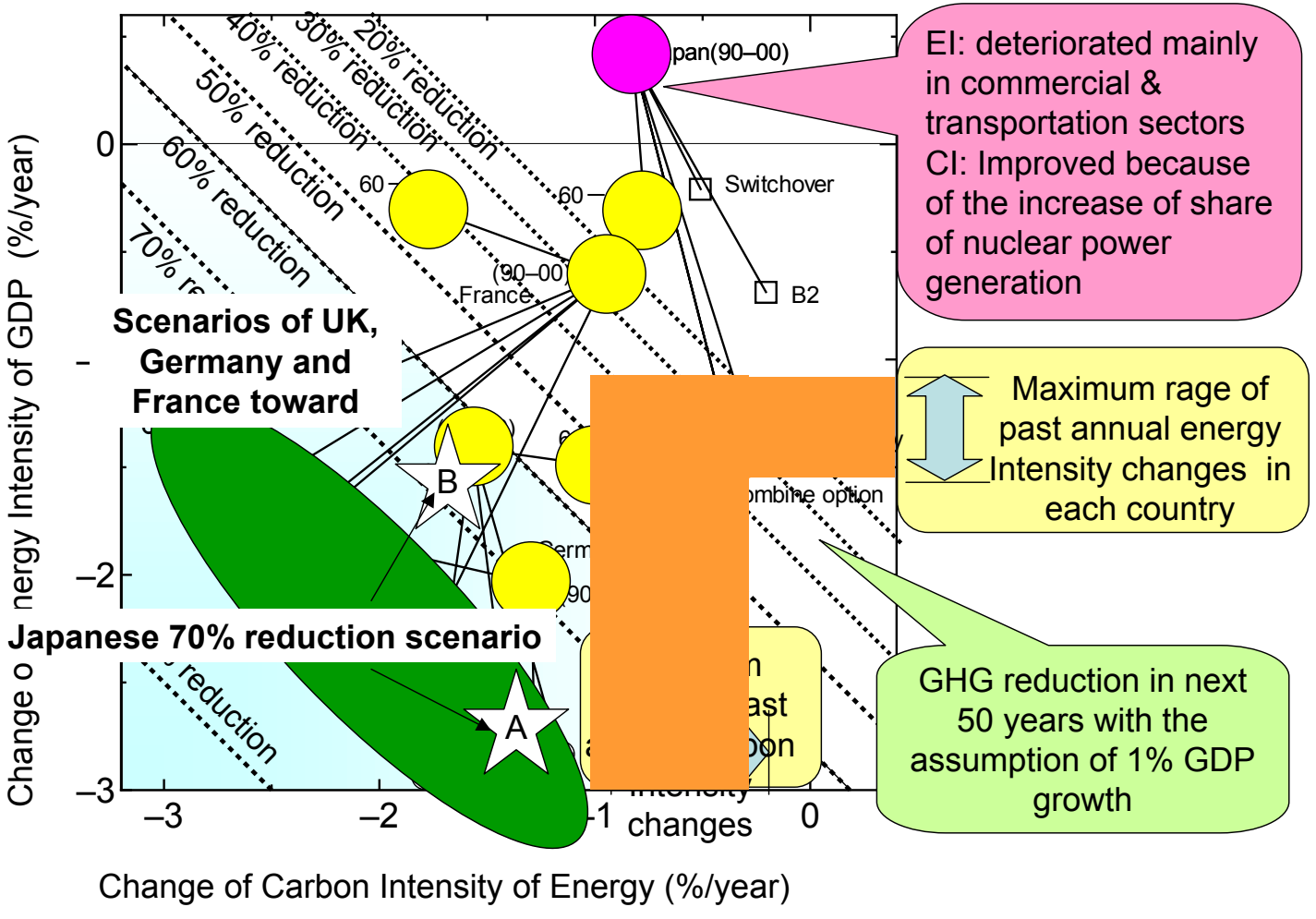


Japan, June 2005
Guidance for Self-sustained
Residential, 50% reductions



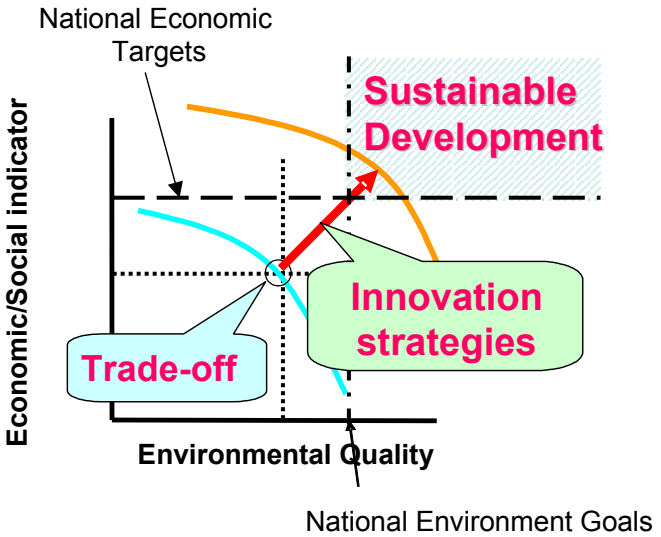
Both supply side and demand side countermeasures are required to achieve 70% CO_2 reduction by 2050

How fast GHG emissions should be reduced?



Development and Climate: Shifting the “Frontier” through:

- Innovations (technology, institutions)
- International and regional cooperation
- Targeted technology and investment flows
- Aligning stakeholder interests
- Focusing on inputs rather than outputs



Development and Climate: Aligning sustainable development & climate

MDG, India's National Targets and Climate Change

MDG and global targets	India's National plan targets	Interface with climate change
Goal 1: Eradicate extreme poverty and hunger **Targets**: Halve, between 1990 and 2015, the proportion of people with income below $1 a day and those who suffer from hunger	· Double the per capita income by 2012 · Reduce poverty ratio by 15% by 2012 · Contain population growth to 16.2% between 2001-2011	· Income effect would enhance choices for cleaner fuels and adaptive · Reduce GHG emissions due to lower
Goal 7: Ensure environmental sustainability **Target 9:** Integrate SD principles in country policies/programs to reverse loss of environmental resources **Target 10:** Halve by 2015 the proportion of people without sustainable access to safe drinking water	· Increase in forest cover to 25% by 2007 and 33% by 2012 (from 23% in 2001) · Sustained access to potable drinking water to all villages by 2007 · Electrify 80,000 additional villages by 2012 via decentralized sources. · Cleaning of all major polluted rivers by 2007 and other notified	· Enhanced sink capacity, reduced GHG and local emissions; lower fossil imports; reduced pressure on land, resources and ecosystems · Higher adaptive capacity due to enhanced reach of water, health &

Development and Climate: Aligning climate policies with local environment

- Co-benefits from joint market for CO2 and SO2 mitigation
- Co-benefits of cooperation for energy-water markets
- Co-benefits of sustainable development and mitigation of climate change
- Risks to long-life assets like infrastructures

Co-benefits analysis for CO2 and SO2 mitigation:

Biomass strategies for aligning sustainable development and climate goals

Biomass Strategies

■ Biomass can enhance rural income, substitute oil imports and enhance mitigative & adaptive capacity of climate change .

Chinese Biomass Resources

■ Chinese biomass resources mainly are agriculture waste, wood and forest residuals, and municipal solid waste. The total resources are about 0.7 billion tce in 2004 and that will increasing to 1 billion tce in 2020.

■ Chinese biomass energy consumption was 299 Mtce in 2004.

Technology Options

Sectors	Options	Baseline	Biomass Innovation
Agriculture	Biomass Stove for products heating	1% in 2030	10% in 2030
Rural resident	Biogas cooking/Village based	0% in 2030	15% in 2030
	Biogas hot water heater	0% in 2030	15% in 2030
	Biomass boiler for space heating	0% in 2030	8% in 2030
Power Generation	Biomass Power generation	2% in 2030	4% in 2030
	Biogas power generation	0% in 2030	2% in 2030
	Bio-Gas power generation from Husbandry	0% in 2030	1% in 2030
Transport	Bio-Diesel	0% in 2030	10% in 2030
	Ethanol from corn	5% in 2030	8% in 2030
	Ethanol from agriculture waste	0% in 2030	5% in 2030
	Ethanol from agriculture products	0% in 2030	6% in 2030

Policy Options

Policy Options	Note
National Target for renewable energy	10% by 2020, was given by renewable energy law. More expected in 2030
Biomass technology R&D	Biogas technologies, Ethanol from agriculture waste
Subsidy for biogas power generation in husbandry	Higher price for power from biogas power generation to cover the cost
Government investment in rural infrastructure	New Countryside in China
Demonstration Projects	Supported by government and international collaboration
Pollutant emission control	Important for ethanol gasoline, bio-diesel
Local MDG	Link biomass utilization with economic development and employment

Policy Case

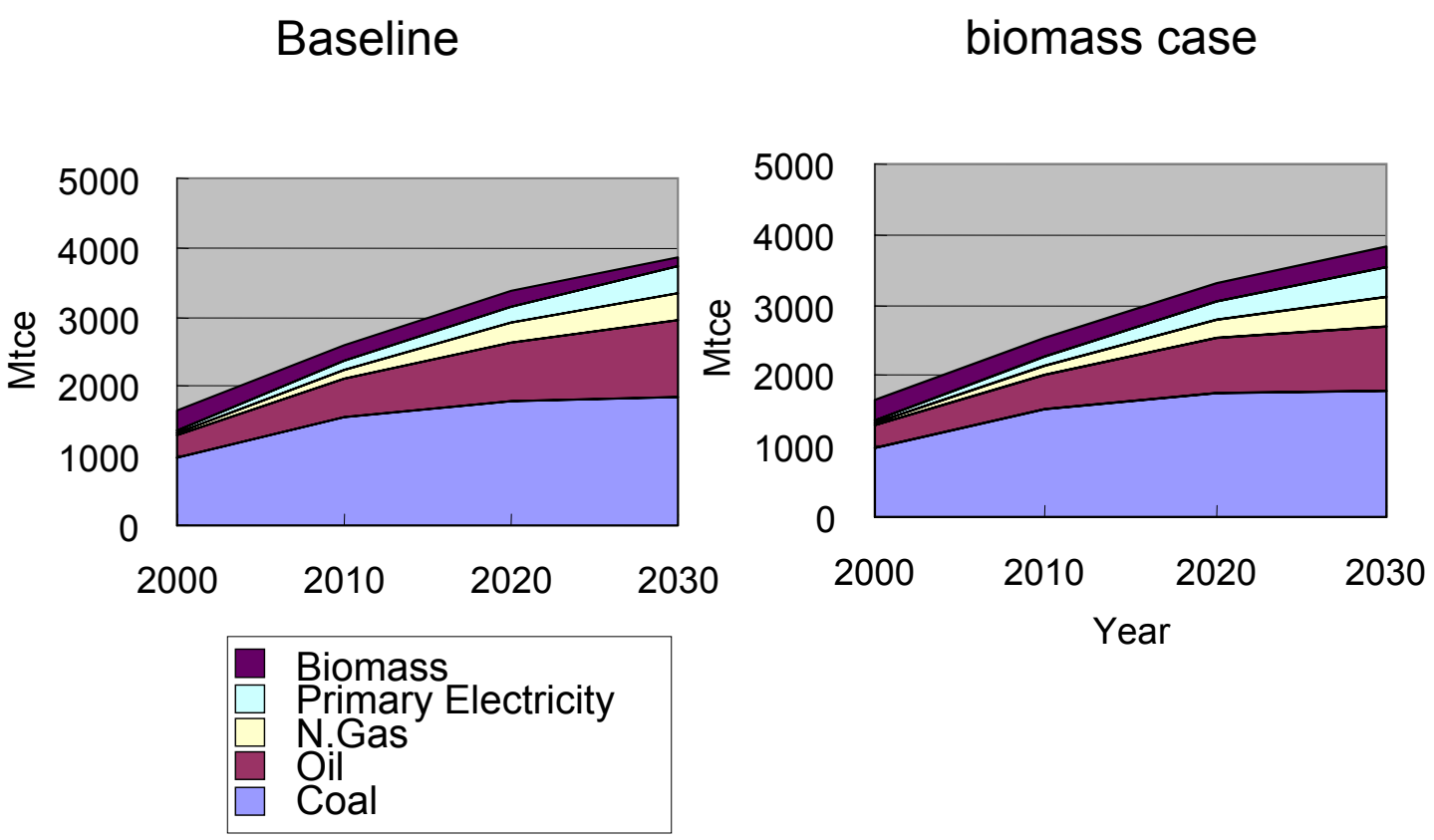
Biomass Power Tariff Application Scope

■ Biomass power including both the direct combustion and gasification of agricultural and forest waste,municipal incineration power, landfill gas, and biogas power

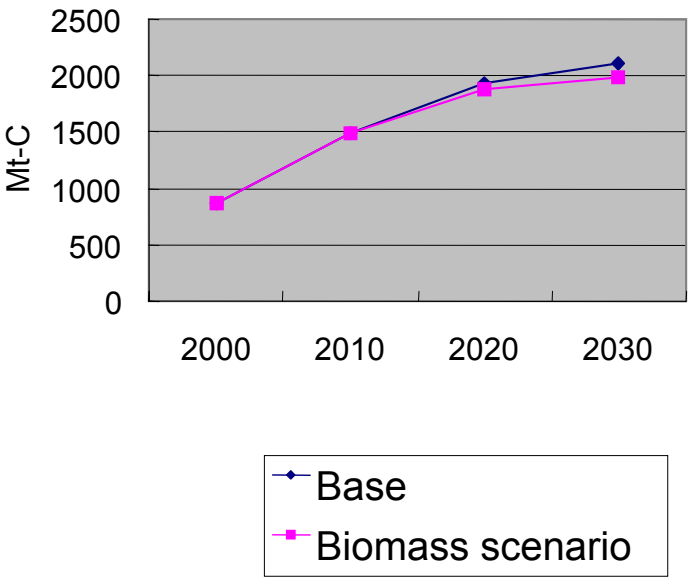
Principles for Setting RE Power prices

■ The internal rate of return(IRR) from RE power projects should be more than the average conventional energy power

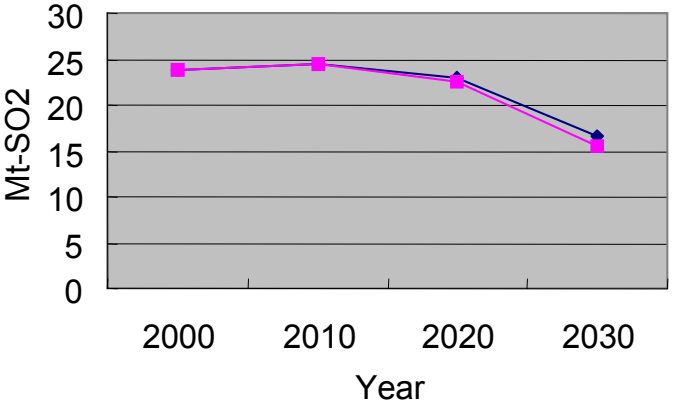
Primary Energy Demand in China: Baseline



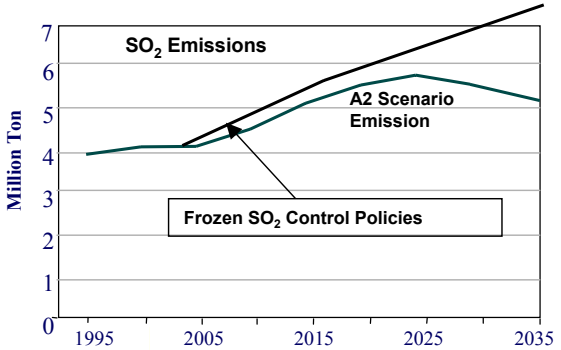
CO2 Emission in China

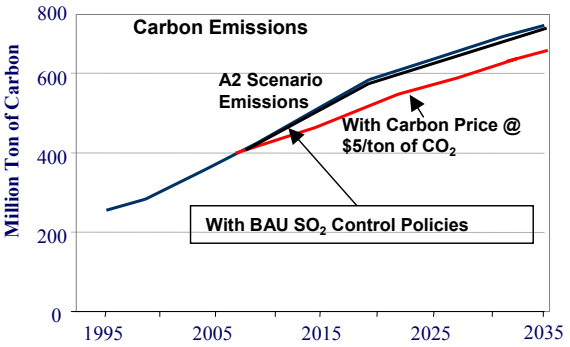


SO2 Emission in China



Joint SO2 and CO2 Mitigation

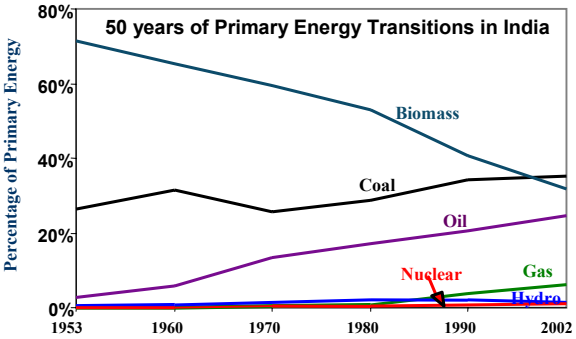




Joint Mitigation (Period 2005-2030)

Mitigation Regime	Co-benefits
SO_2 mitigation alone	Little carbon mitigation
Joint Mitigation: CO_2 mitigation @ $5/ton & same SO_2 target	Joint mitigation costs $400 Million less

Energy Security and GHG Mitigation



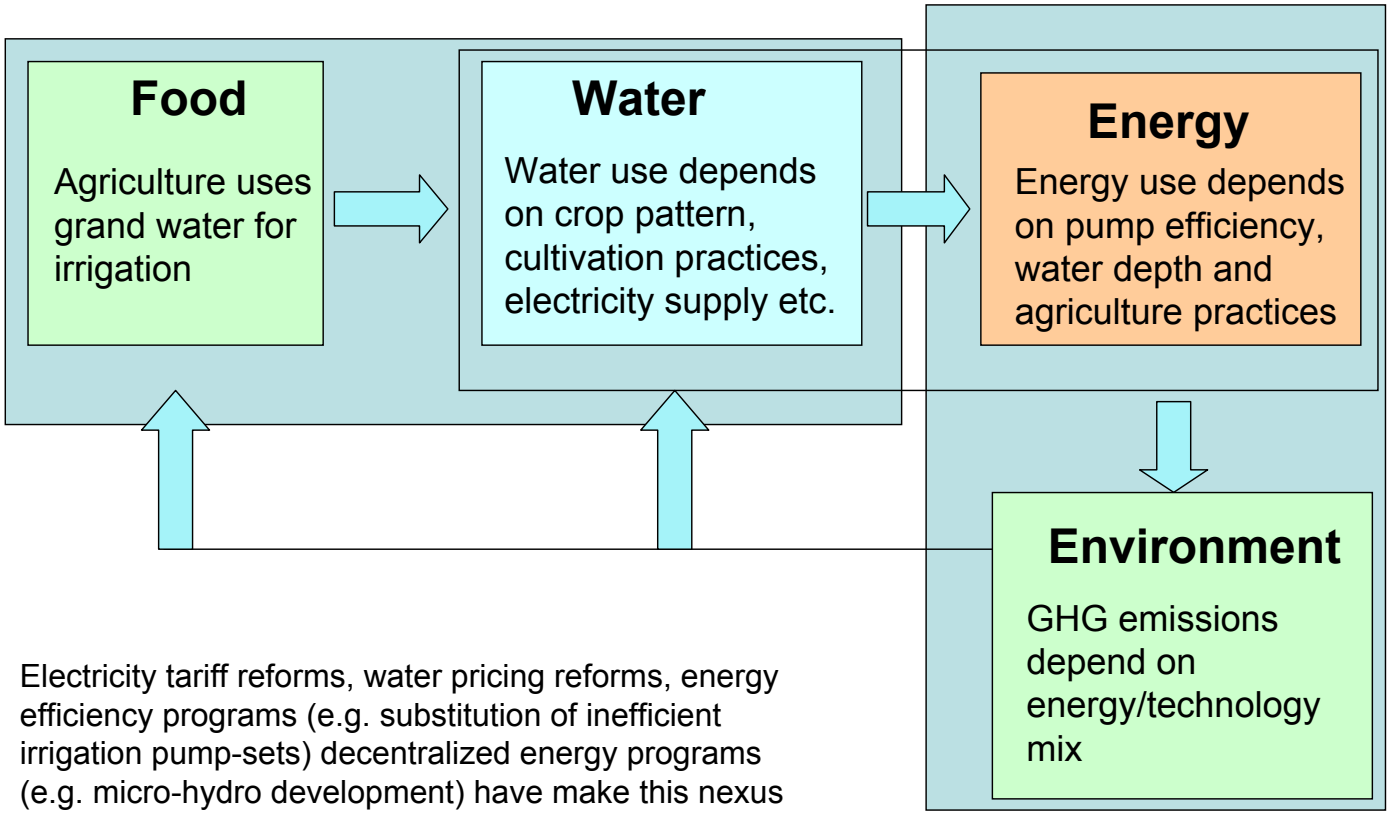
Energy Security: How choices matter to climate?

- Domestic Coal – High Emissions
- Nuclear Fission – Carbon Free, Safety Issues
- Wind – Limited Potential, Supply stability
- Solar – High upfront cost, Supply stability, Storage
- Bio-fuels
  - *Ethanol – Food Security, Water Stress*
  - *Bio-Diesel – Land Restoration, Employment*

Indian Bio-diesel Mission

- **Phase I (2003-07):Demonstration Projects**
  - *Crop: Jatropha Curcas*
  - *400,000 hectares of land*
  - *Participation by Oil Companies*
- **Phase II (2007-2012)**
  - *Self Sustaining Expansion of Biodiesel*
  - *Production target 1.2 MT of oil/ hectare*

Food-Water-Energy-Environment Nexus



Electricity tariff reforms, water pricing reforms, energy efficiency programs (e.g. substitution of inefficient irrigation pump-sets) decentralized energy programs (e.g. micro-hydro development) have make this nexus more sustainable

Conclusion: Aligning Development and Climate

Transition to Low Carbon Society

- Global development along high carbon path is untenable
- Stand-alone decarbonization is costly
- Most sustainable development actions are climate friendly
- Mainstreaming climate change in development actions reduces welfare losses

Open Symposium "Challenges to achieve Low Carbon Society - 1st anniversary of Kyoto Protocol -"

16 February 2006

Organizer: Ministry of Environment, Japan (MoEJ), Co-Organizers: British Embassy to Japan, National Institute for Environmental Studies (NIES)

We had around 400 audiences.

Minister of the Environment, Koike and the British Ambassador to Japan, Graham Fry pressed that we start joint research project for challenges to achieve Low Carbon Society (LCS).

Sir Graham Fry

Ms Koike

What is role of technology for sustainability?
What kind of future we'd like to have?

Open Symposium "Low-Carbon Society Scenario toward 2050: Scenario Development and its Implication for Policy Measures" (24 March 2005) & Workshop (25 March 2005), Tokyo

Japan Low Carbon Society 2050

NIES COP11 and COP/MOP1 side event on December 3rd in Montreal

Global Challenges Toward Low-Carbon Economy (LCE) -Scenarios from 8 countries -

The 11th AIM International Workshop on 19-21 Februar 2006, Tsukuba

AIM/APEIS Training Workshop (November, 2005)

Thank you for your attention!

For more information, please visit http://www-iam.nies.go.jp/aim & http://2050.nies.go.jp.