

**Role of Knowledge Community in
New Recurrence to “Human as a part of the Nature”**

**International Forum on Sustainable Future in Asia
1st NIES International Symposium**

**January 27-28, 2016
At AIT**

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Institute for Global Environmental Strategies (IGES)**



Role of Knowledge Community in New Recurrence to “Human as a part of the Nature”

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- 4. Policy to enhance “Action”**
Procedure, objective, element, mechanism for activating stakeholder’s
- 5. Knowledge community as an “Agent of Change”**

1. Changing recognition on nature

- **Environment = Interaction between human activities & nature**
- **Resolution : MDG: within human society**
 - ⇒SDG: human society + nature
 - ⇒CC : **human society within nature**
- **Climate: Mother of all natural resources**
 - **Many SDGs deeply relate to climate: Water, Bio-diversity, Health, Hunger, Conflict,,,,,,**
 - **“Zero emission” : Only one solution to stabilize climate**
 - **Ultimate energy supply : Solar energy and its derivative**
- **Re-recognition of “Human being as a part of nature “**
- **Zero emission : Logical (scientific, natural) necessity (not human logic)**

Millennium Development Goals (MDGs 2000-15)

1. Eradicate extreme hunger and poverty	2. Achieve universal primary education	3. Promote gender equity & empower women	4. Reduce child mortality
5. Improve maternal health	6. Combat HIV/AIDS, malaria et al.	7. Ensure environmental sustainability	8. Develop a global partnership for development

Sustainable Development Goals (SDGs 2015-)

1. No Poverty	2. Zero Hunger	3. Good health & well-being
4. Quality Education	5. Gender Equality	6. Clean water and sanitation
7. Affordable and clean energy	8. Decent work and economic growth	9. Industry, innovation and infrastructure
10. Reduced inequalities	11. Sustainable cities and communities	12. Responsible consumption and Production
13. Climate Action	14. Life below water	15. Life on land
16. Peace, justice and strong institutions	17. Partnerships for the goals	Relate to nature & climate

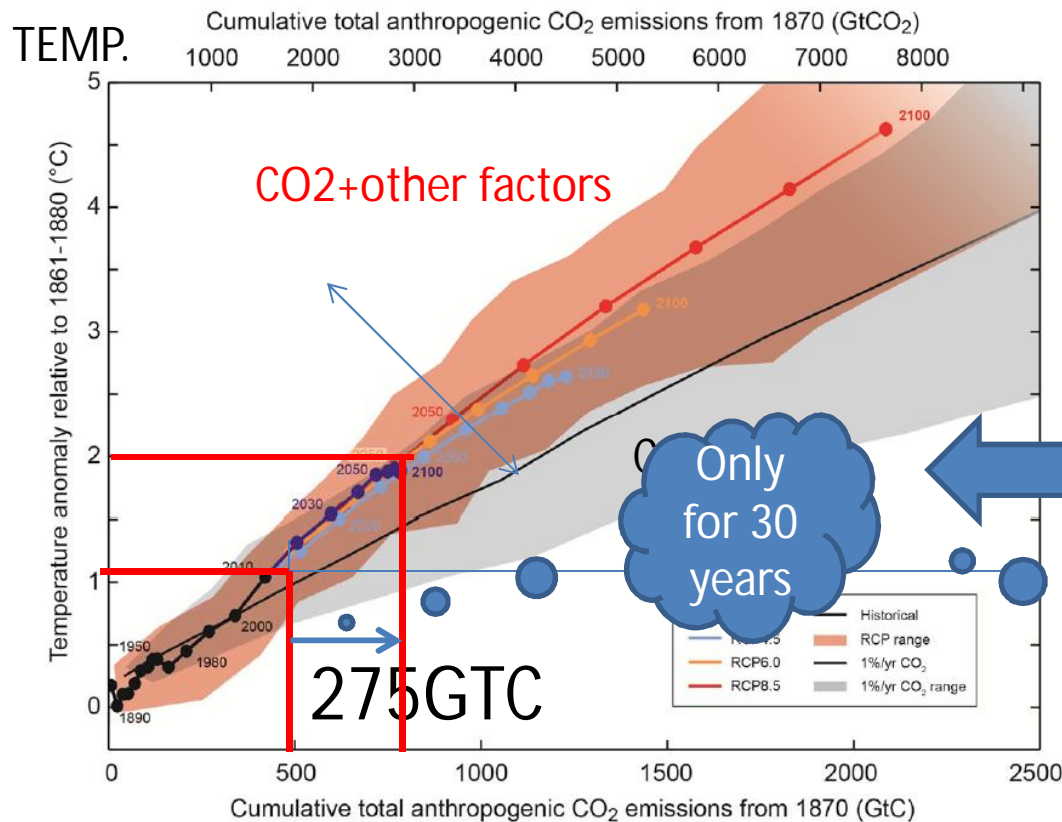
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Sustainable Development Goals (SDGs 2015-)



Temp. rises in relation with cumulative GHG emission
 ⇒ Temp. rises as long as emission continues
 ⇒ **Zero emission is only one ultimate solution to stabilize climate**



Allowable budget

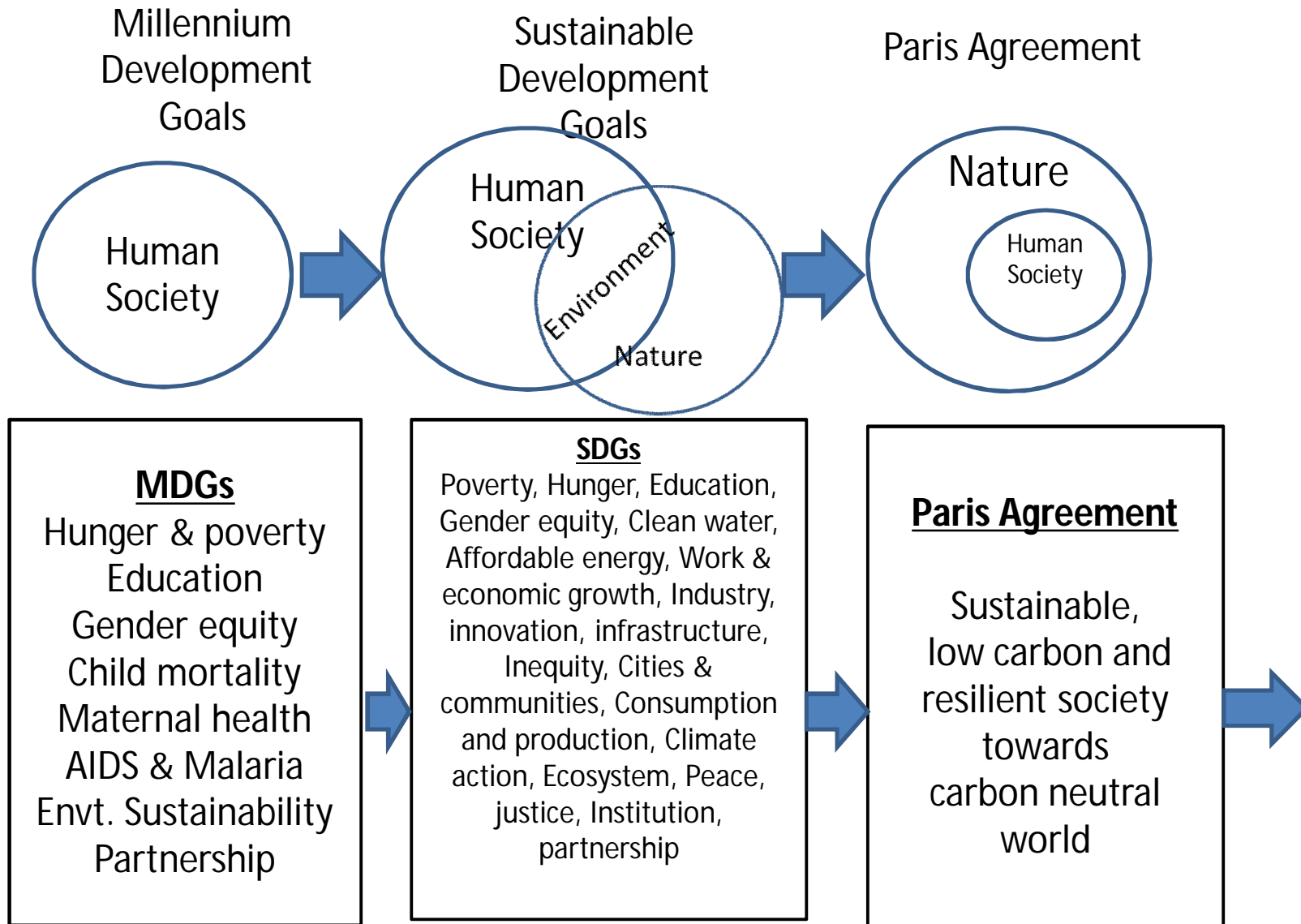
- 2°C ⇒ 790 GtC
- 515GtC emitted already
- **only 275GtC remained**
- 2013 emission= 9.9GtC

Transition to low carbon society within 50-100 yr.

Cumulative total anthropogenic CO2 emission from 1870 (GtCO2)

1. From MDG to SDG: CC as locomotive

Recognition of "Human as a part of the Nature"



Response to climate change: Locomotive of new transition

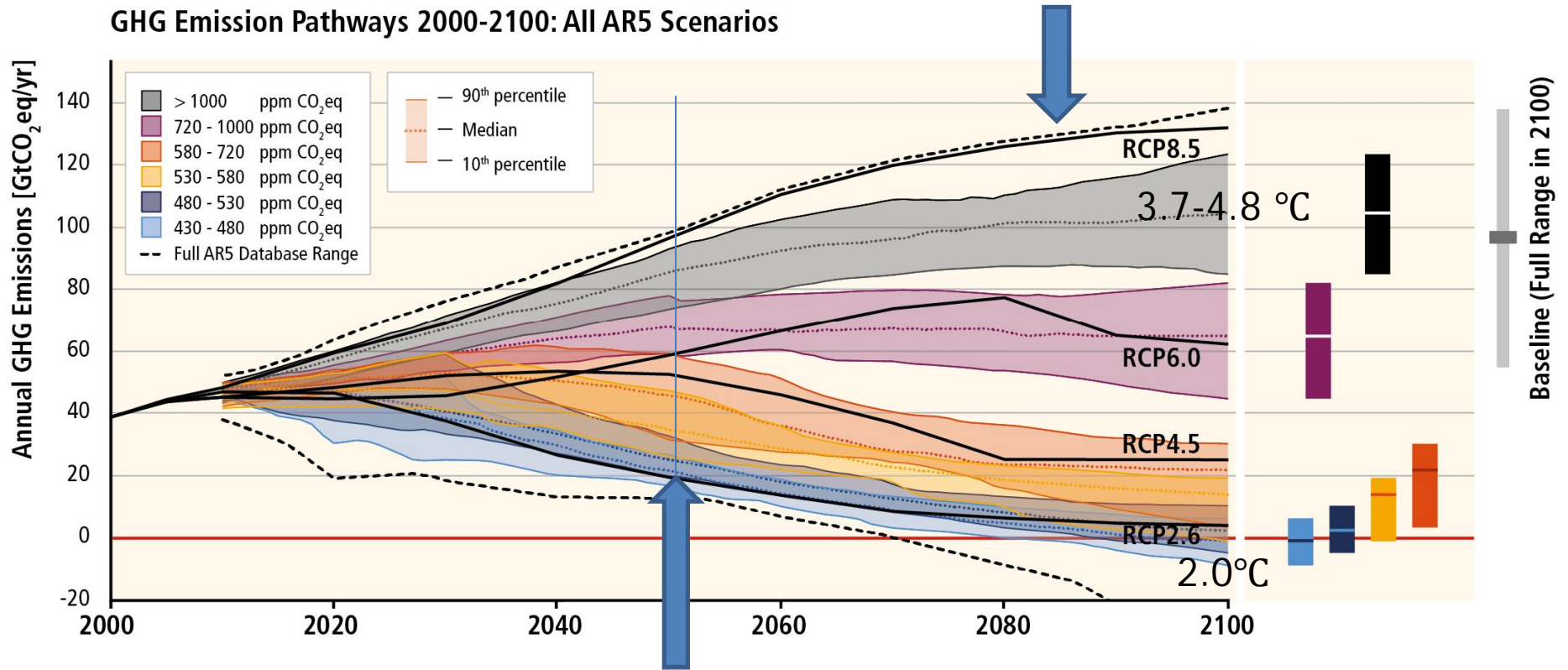
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2. Paris Agreement: New recurrence to “Human as a part of the Nature”

- Paris Agreement: Signal gun for transition to carbon-neutral civilization
- Major conclusions of Paris COP21
 - Shared Nature’s logic of “Carbon Neutral=exclusive ultimate solution
 - All parties promised GHG reduction :
 - no free-rider for protecting global common of stable climate
 - Submitted concrete “Action (reduction) plan “ :
 - Intended Nationally Determined Contribution (INDC)
 - Proceed to action shared process by revisiting principle of “Common but Differentiated Responsibility (CBDR) “
 - Dev’ed: Fund & Tech, Dev’ing: Plan & Capacity Building fore effective use, Checking system as UNFCCC
 - Moved to Negotiation to Action on the ground
 - Mobilize to action of non-government, like-minded leading stakeholders (outside of climate society : civil societies, cities, industries, funding organizations, knowledge community,,)
 - Hi-investment for this transformation will give impacts to other SDG , including changing bubble economy to more substantial economy
- What are the roles of “Knowledge community” in this huge transition?

Global target: Halving of current emission by 2050

Without more mitigation, global mean surface temperature might increase by 3.7° to 4.8°C over the 21st century

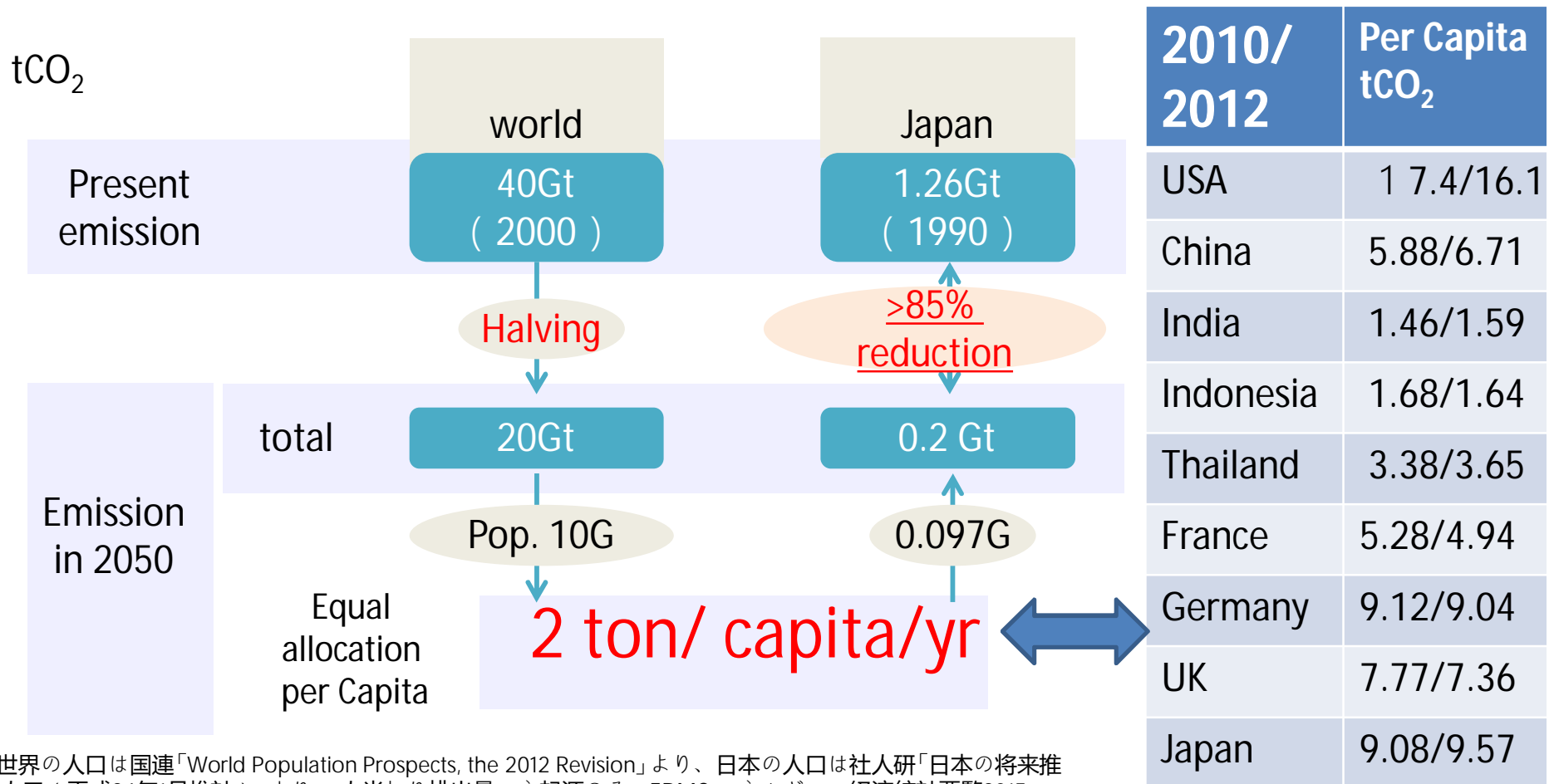


To avoid 2 degree rise, path of passing 50% reduction from now in 2050 is feasible and reasonable .

Towards 2ton/Capita world

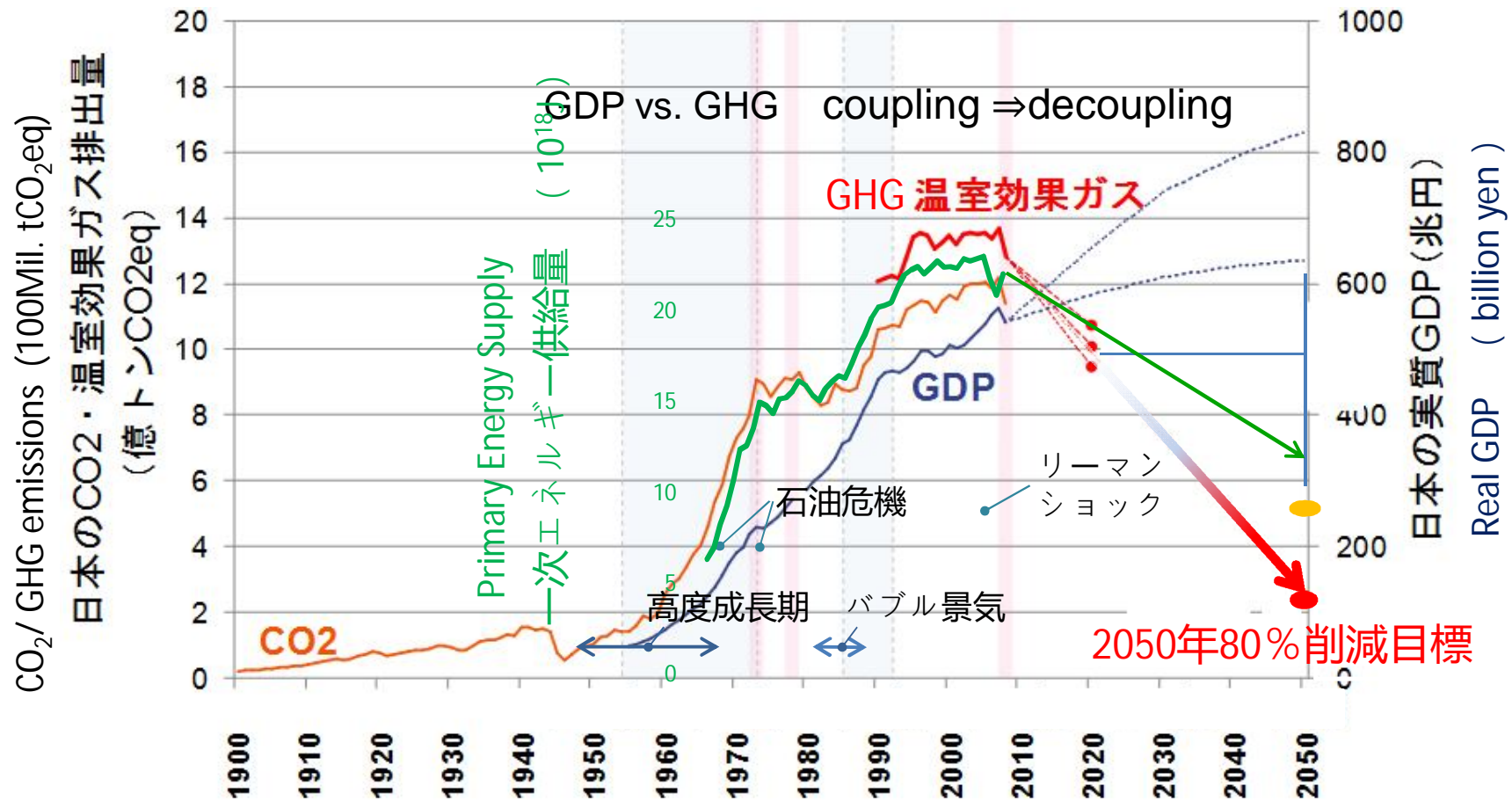
2°C Target ⇒ Halving in 2050 worldwide ⇒ 2 tCO₂ /Capita

Japan: more than 80% reduction(base:1990)



※世界の人口は国連「World Population Prospects, the 2012 Revision」より、日本の人口は社人研「日本の将来推計人口(平成24年1月推計)」より.一人当たり排出量エネ起源のみ、EDMC エネルギー・経済統計要覧2015

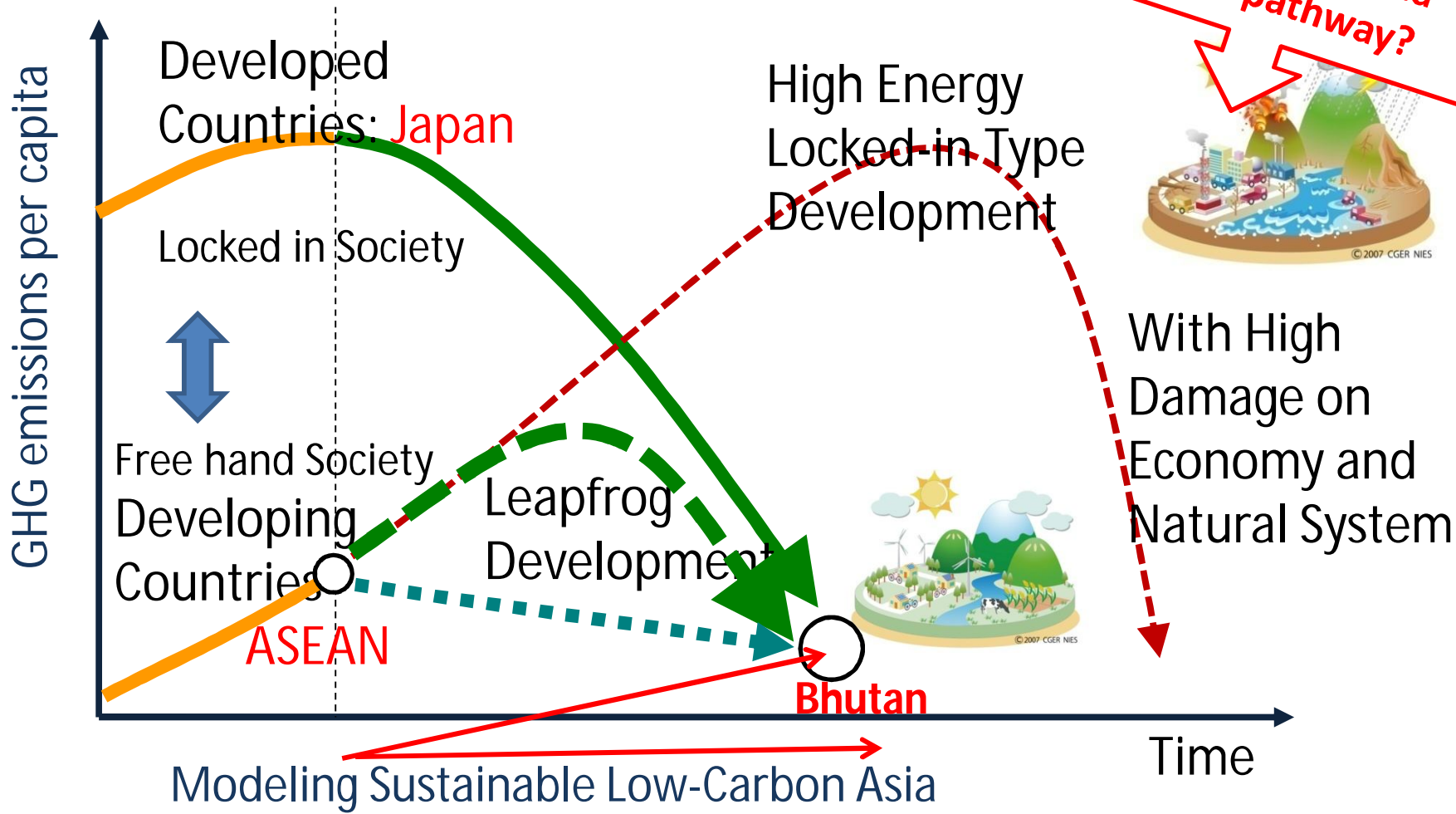
Japan: Drastic transformation towards 2050 Break away from high energy and carbon dependent society



) GDPの将来値は国立環境研究所 脱温暖化2050プロジェクト A・Bシナリオの想定値

LCS scenario in Asia

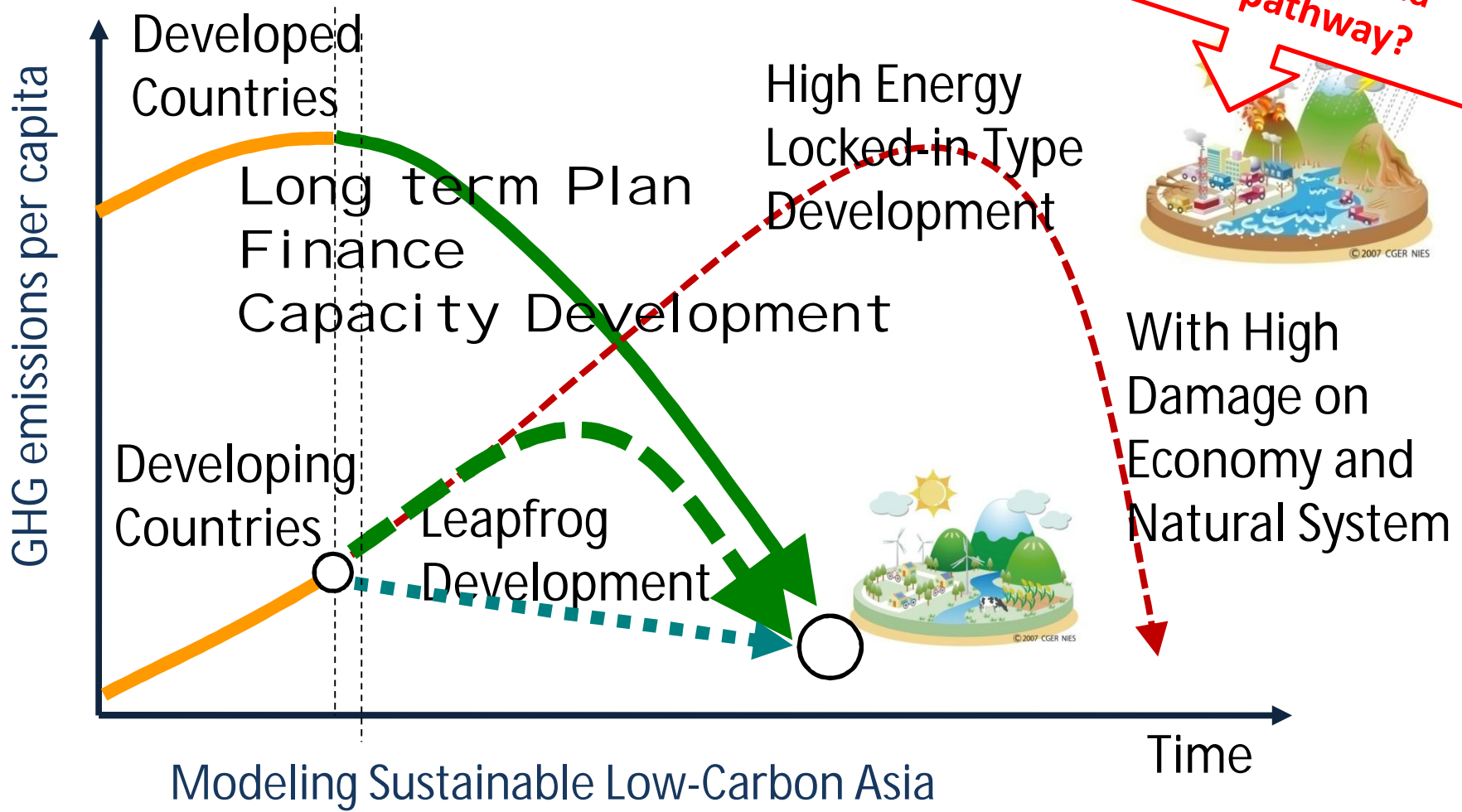
道筋を
Challenge of Asia
Which pathway?



"Asian Low-Carbon Society Scenario Development Study" FY2009-2013, funded by Global Environmental Research Program, MOEJ

LCS scenario in Asia

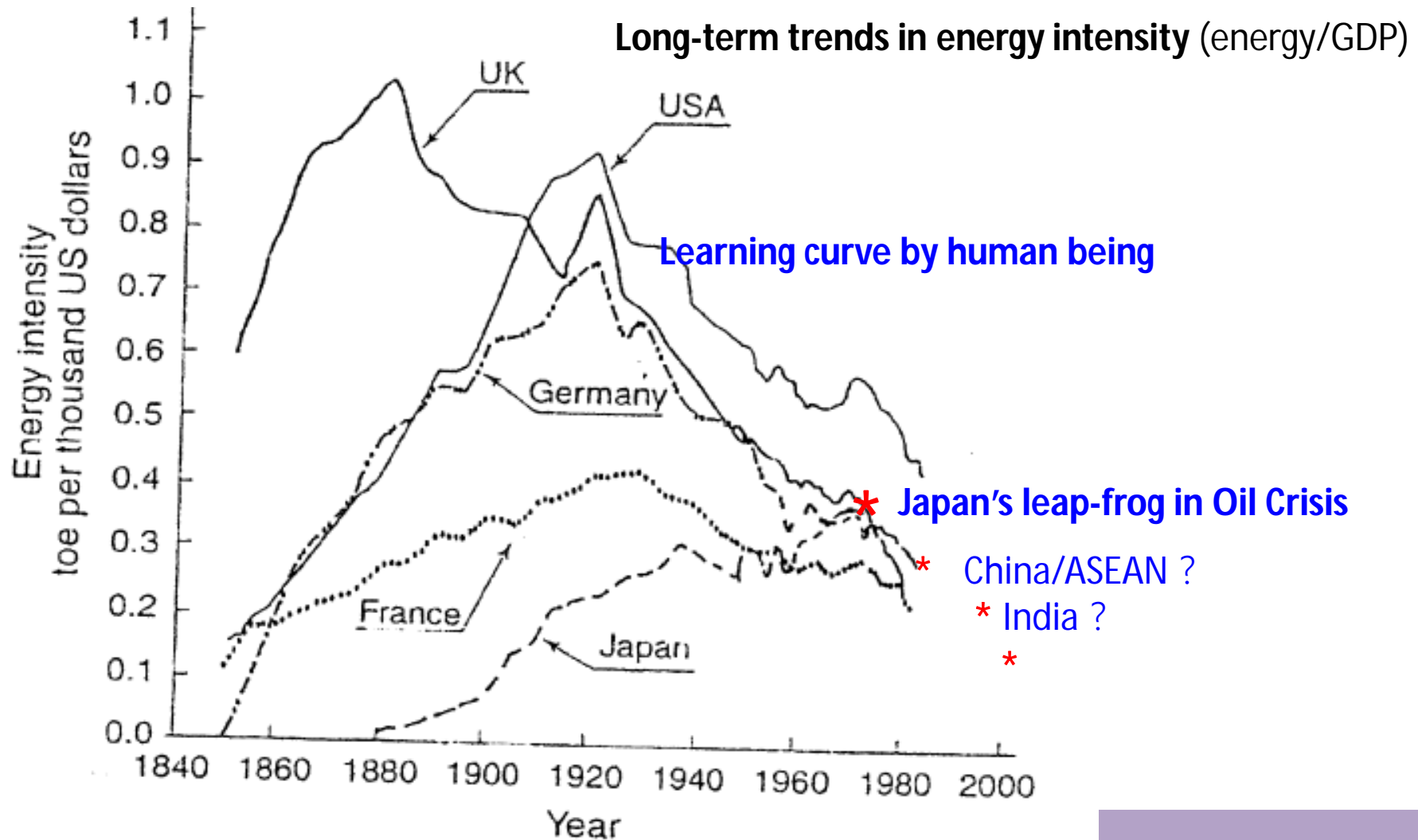
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Modeling Sustainable Low-Carbon Asia

"Asian Low-Carbon Society Scenario Development Study" FY2009-2013, funded by Global Environmental Research Program, MOEJ

Opportunities for Asia: Leveraged by climate change



Co-benefit of low carbon development

**Case of City of Kita-Kyushu: Before and after 1970s'transition :
Switch from coal to oil & gas, improve energy efficiency to cope with oil crisis
and innovation in pollution control technology**



The atmosphere in Kitakyushu, Japan: before and after the clean up (SOE2000).

after 40 years : result of rapid infrastructure construction



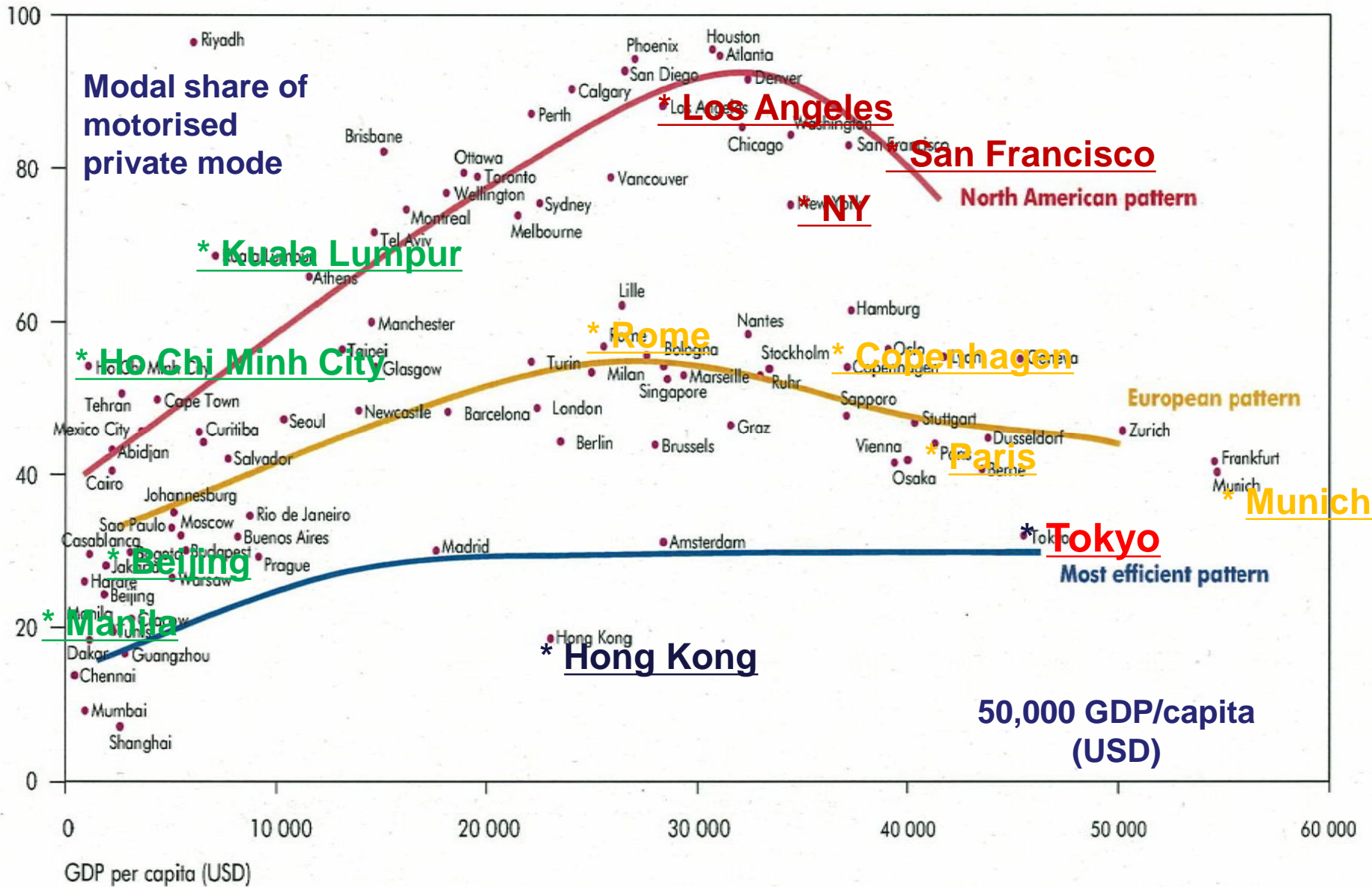
*Now aged society
in problem*

Future compact city



Source: Local Development WG team

Co-benefit of prioritizing public transportation system for safe, punctual, clean and efficient mobilization

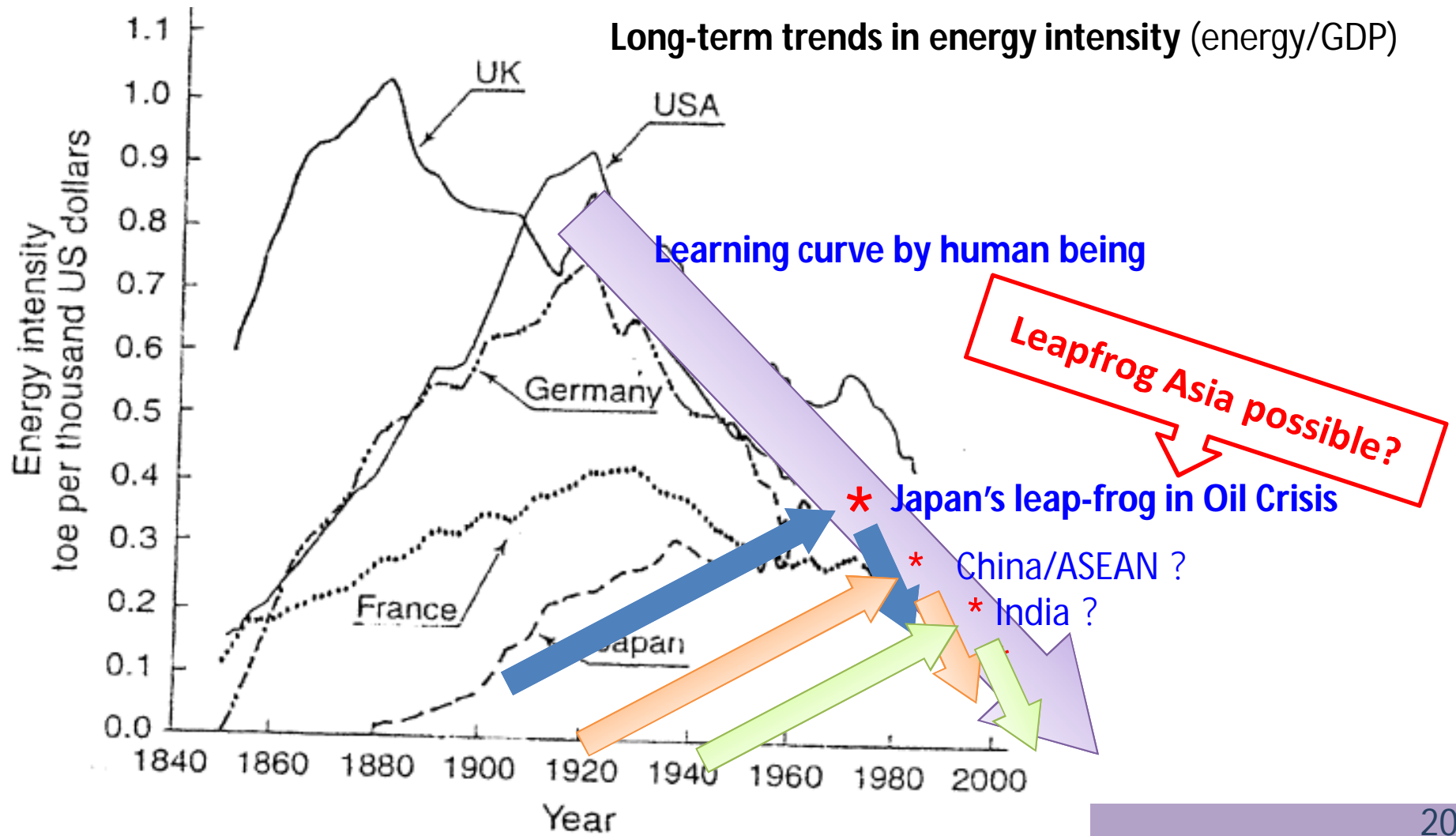


Source: IEA (2008)

Example of Leap-frogged Asia

	<i>Country</i>	<i>Domestic factors</i>	<i>External factors</i>
<i>Industrial structure</i>	<u>India:</u> IT industry	Education/ human resources	Soft technology Globalization
<i>Energy structure</i>	<u>Japan:</u> Low energy intensity	Technology Rapid growth	Oil crisis Energy security
<i>Urban structure</i>	<u>Singapore:</u> Transportation, water, housing <u>Tokyo:</u> Public transportation	Small land area Strong leadership Rapid urbanization	Relationship with Malaysia In advance of auto age
<i>Distributed energy</i>	<u>India:</u> Renewable energy, biomass <u>Brazil:</u> Ethanol	Poor power grid investment; land area Sugar cane, scarce oil	
<i>Information</i>	<u>China:</u> Mobile phones	Rapid economic growth, big land area, Not enough com-grid	IT technology
<i>Renewable energy system</i>	<u>China:</u> Wind/solar energy	Vast land area	Climate change
<i>Agriculture</i>	Low energy use	Self sufficiency	Energy price

Opportunities for Asia: Leveraged by climate change



3. Urgency of “Transition”: Collect **all human wisdom** towards carbon neutral world

- Why all wisdom?
 - Small emission budget (allowable GHG emission) remains:
 - Run out within 30 years for 2 degree target
 - Change to carbon neutral society within two generations (70-100 years)
 - Halving GHG in 2050 \Rightarrow 2 tons/capita/year \Rightarrow almost all countries have to aim reduction
 - Huge change of energy hi-dependent civilization
 - Matter of all the stakeholders in “society”, not only of technology or economy

4. Policy to enhance “Action”: Procedure, objective, element, mechanism for activating stakeholders

- Global scientific assessment system (done by IPCC)
- Global agreement (done by COP21)
 - Global target setting 2 degree, Carbon neutral society within less than 100 years/ Reduction checking system/International cooperation system
- National target setting : NDC + for 2050 and beyond

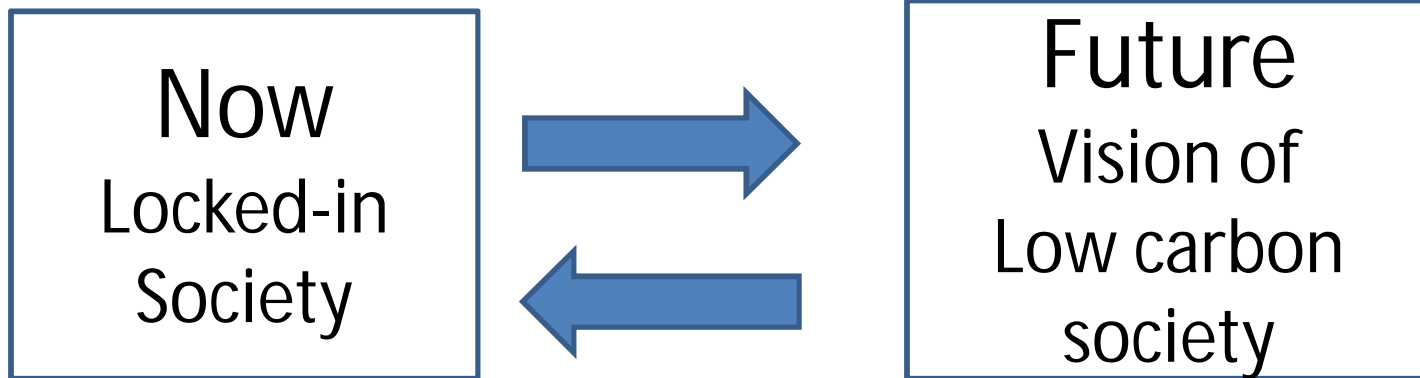
- Long-term policy setting by back-casting and roadmap
- Element for policy making: basic statistics, GHG Inventory, methodology in forecasting, planning, economic evaluation & **PDCA/MRV system**
- Setting climate policies and measures (based on carbon pricing)
- reduction of total energy consumption by **sustainable consumption & production**, renewable energy, **conservation of natural absorption functions**, adaptation
- Mobilizing stakeholders to action by policies and dialogues

Backcasting

marginal/passive decision

Adapt to major trend

Forecast



Backcast

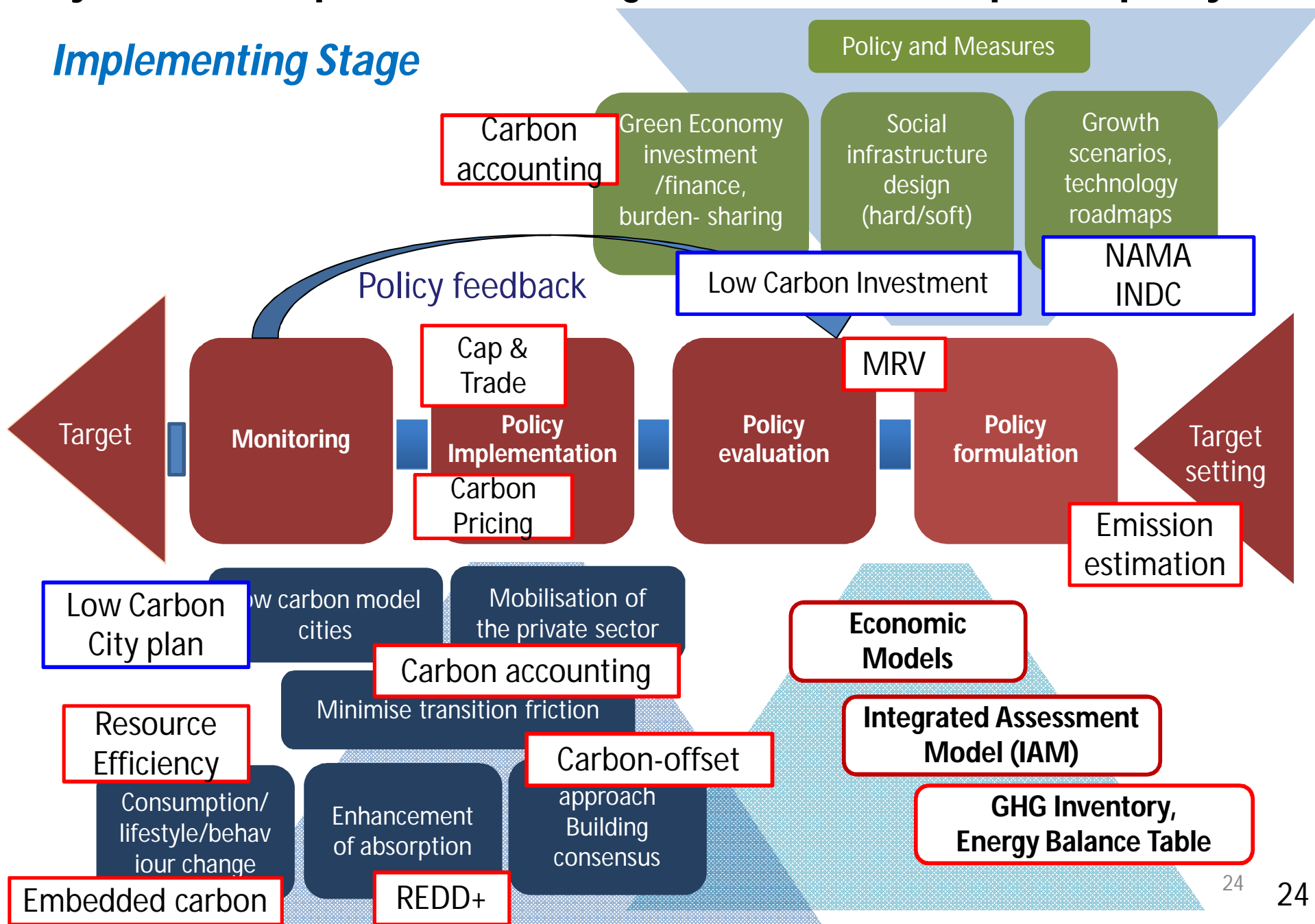
Explore own pathway

to realize desired target

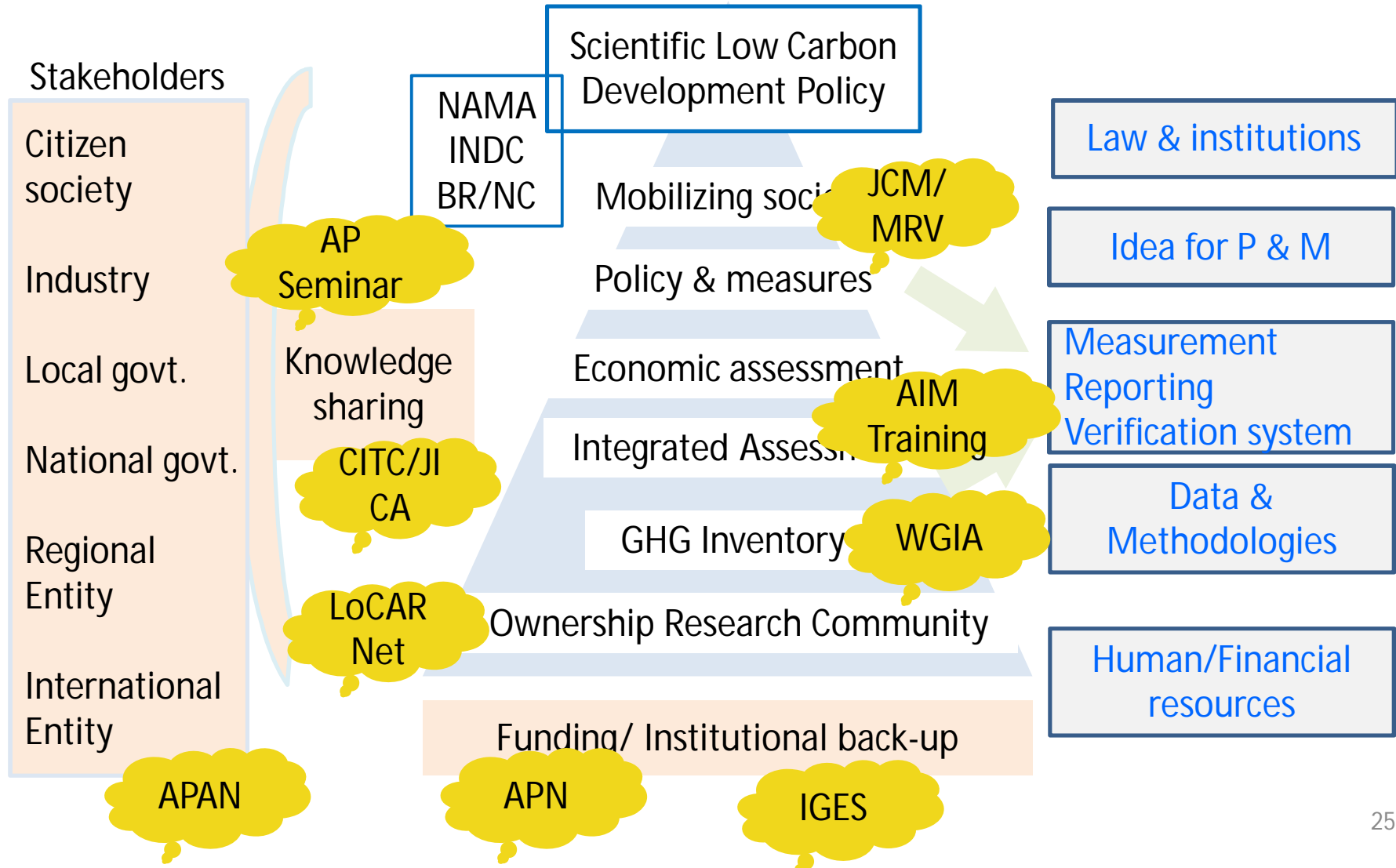
mainstream/active decision

Systematic Steps for formulating low-carbon development policy

Implementing Stage



Elements Supporting Scientific Low Carbon Development Policy

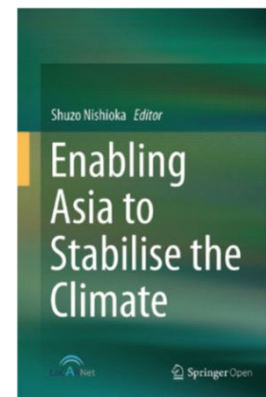


LoCARNet: Low Carbon Asia Research Network

- An open network of researchers, research organisations, as well as like-minded relevant stakeholders that facilitates the formulation and implementation of science-based policies for low-carbon development in Asia.



- To date, LoCARNet has facilitated **policy-dialogues** between researchers and policymakers.
- LoCARNet has conducted **annual meetings** for knowledge-sharing, and support for **capacity development** in Asia.



Enabling Asia to stabilise
the climate

 Open Access

Available from

► link.springer.com

5. Knowledge community as an “Agent of Change”

- Key role as interactive position between nature and society
- Interpreter of voice of nature by observation, analysis, scientific assessment (IPCC), forecasting and early warning
- Can be an “Agent of Change”
 - Sharing knowledge within Academia and among other stakeholders for common agenda
 - Organizing solution oriented knowledge community with ownership of the place (region, nation, city, ..) and participating policy making process there
- Proposing policy and countermeasures
- Inclusion of business and industry, civil society, media, ..

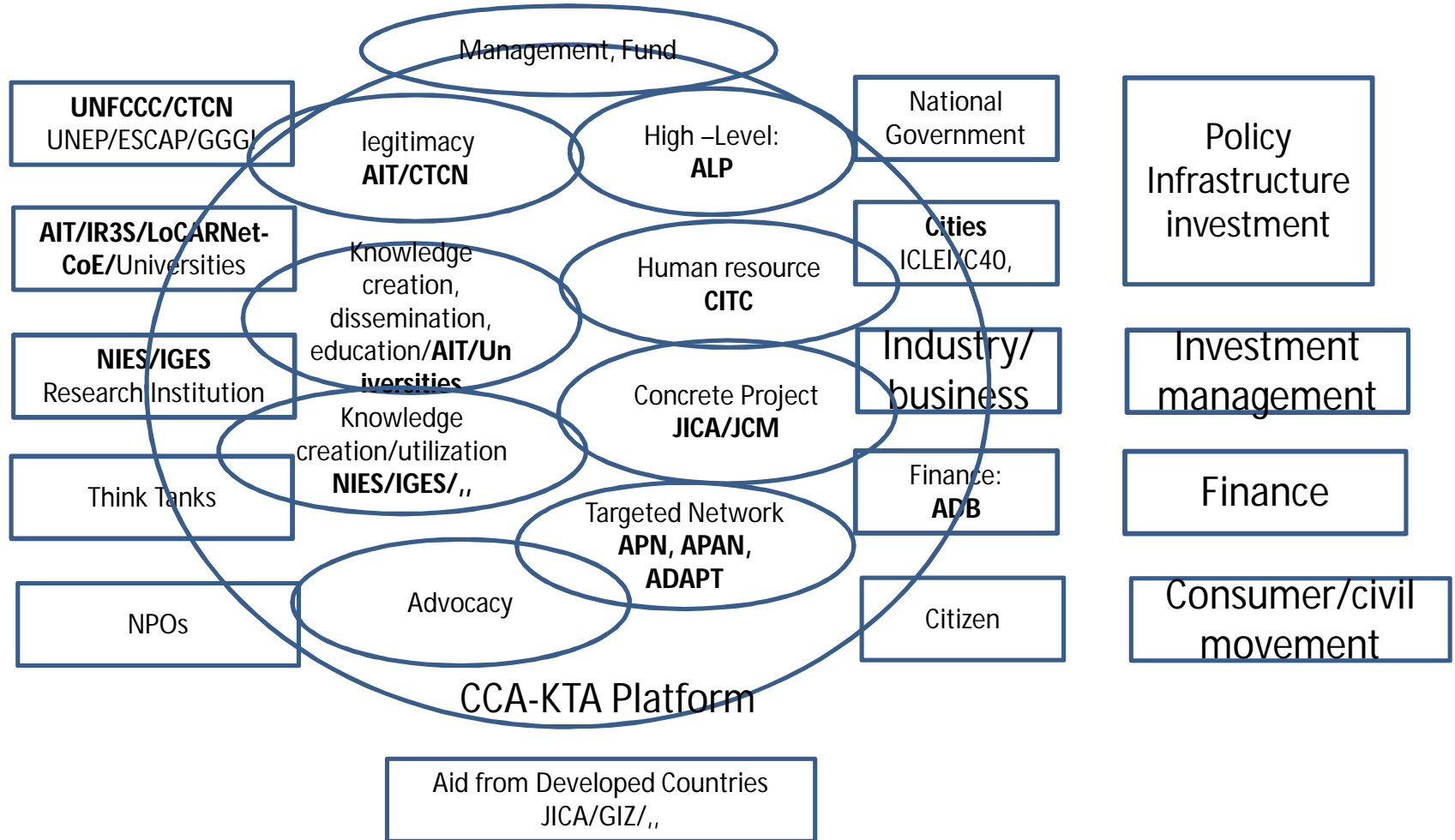
CC Action in Asia

Knowledge Community

Change Agent

Action entity

Action





Thank you very much for your attention!



LCS-RNet/LoCARNet Secretariat
<http://lcs-rnet.org/index.html>

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2108-11 Kamiyamaguchi, Hayama, Kanagawa 240-0115, Japan

E-mail: lcs-rnet@iges.or.jp
Fax: +81 (0)46 855 3809

New Development

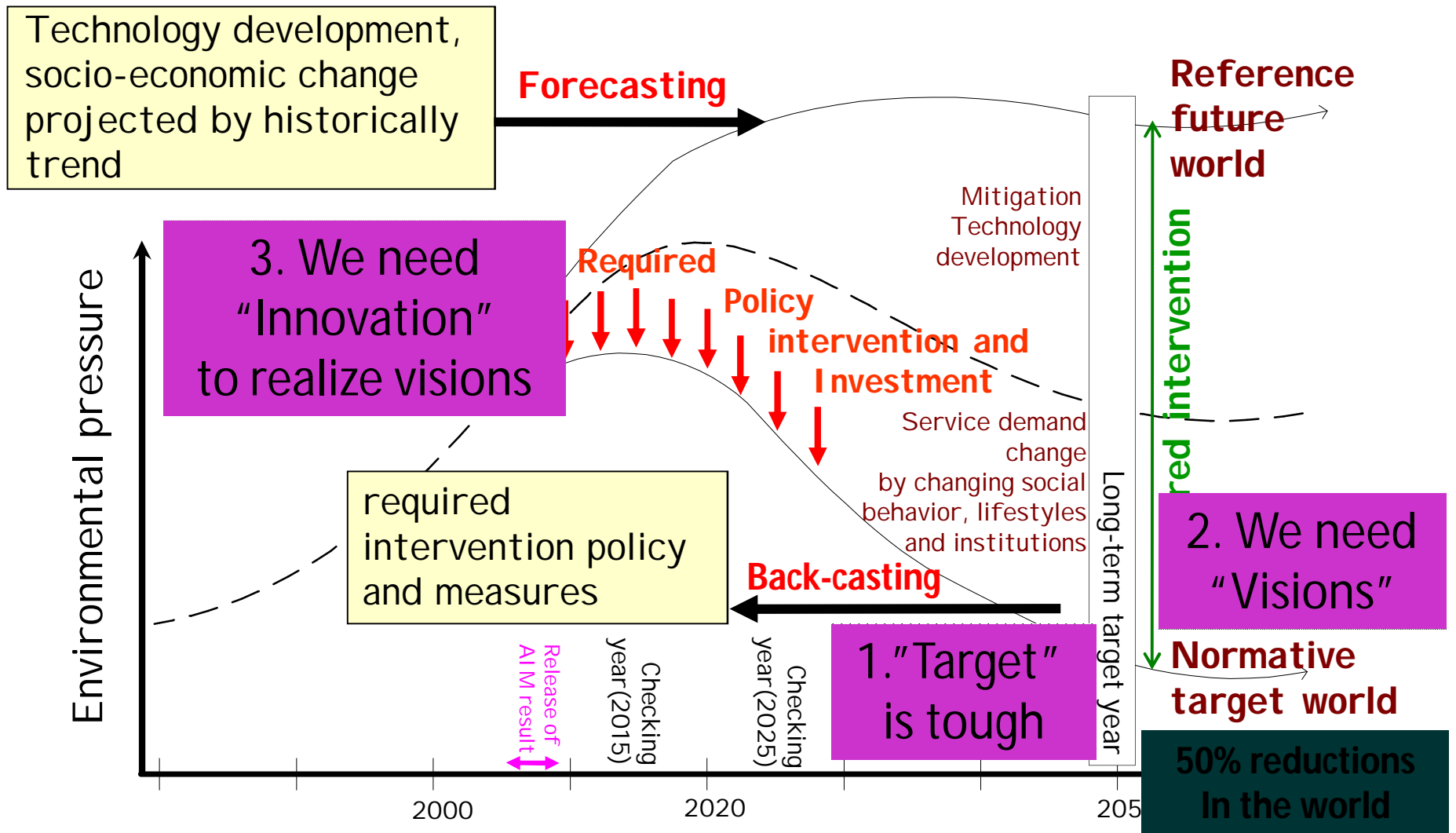
- **Multi-fields, multi-approaches**
- **CoE alliance as core**
- **Ownership of each country**
- **Strengthening South-South Cooperation**
- **Co-design/Co-work with other active stakeholders**

- **Knowledge community as “Agent of Change”**


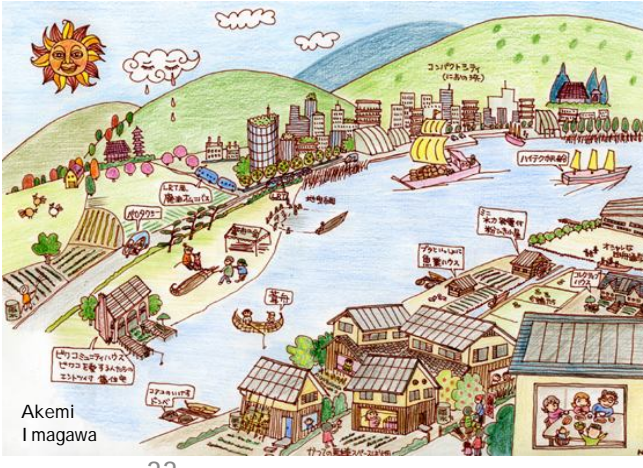
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Forecasting from now and Backcasting from future prescribed/normative world



As for LCS visions, we prepared two different but likely future societies

Vision A "Doraemon"	Vision B "Satsuki and Mei"
Vivid, Technology-driven	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
2%/yr GDP per capita growth	1%/yr GDP per capita growth
	



Doraemon is a Japanese comic series created by Fujiko F. Fujio. The series is about a robotic cat named Doraemon, who travels back in time from the 22nd century. He has a pocket, which connects to the fourth dimension and acts like a wormhole.

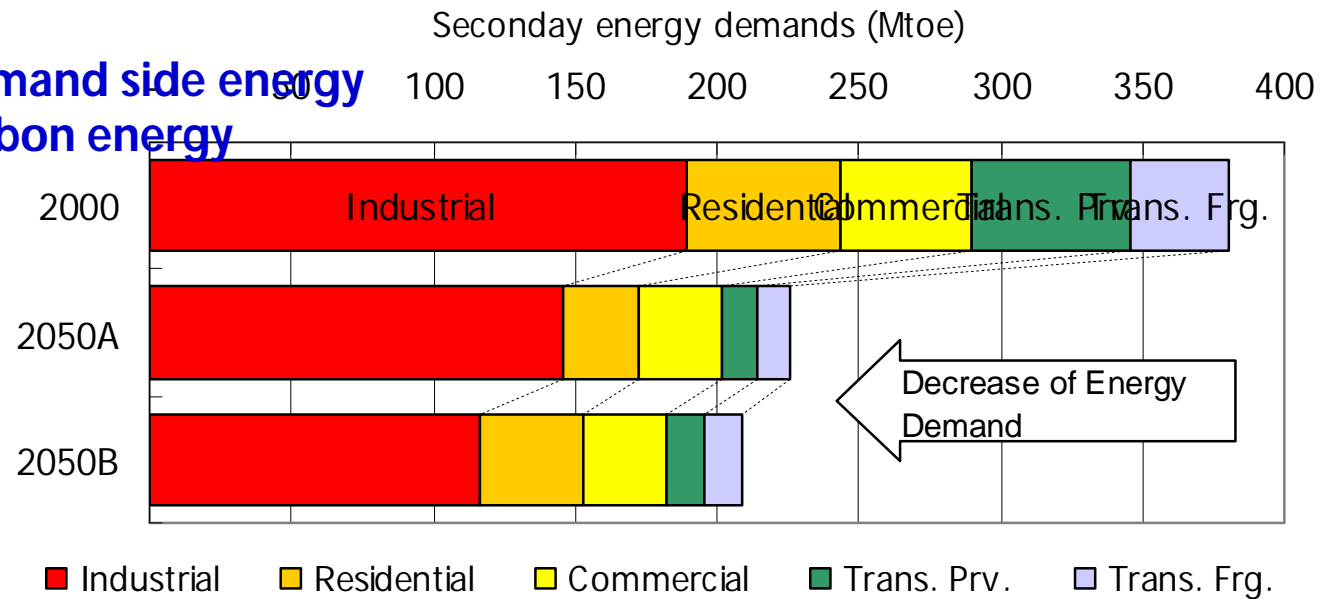


Satsuki and Mei's House reproduced in the 2005 World Expo. Satsuki and Mei are daughters in the film "My Neighbor Totoro". They lived an old house in rural Japan, near which many curious and magical creatures inhabited.

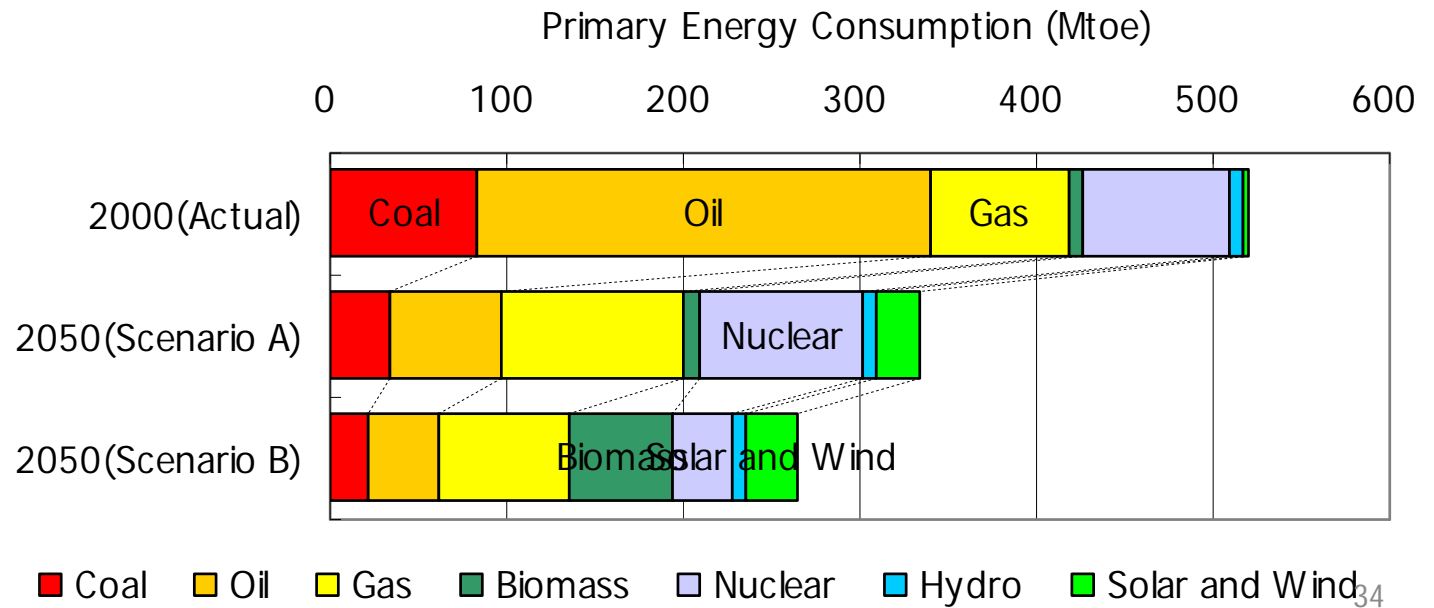
Conclusion: 70% reduction feasible: Direct cost: 1% of GDP/Y

Combination of demand side energy reduction + low carbon energy

Final energy demands



Primary energy supply



Towards Nature-symbiosis Knowledge Network in Asia:

Ex. Activities of Low Carbon Asia Research Network

Collect all the human wisdom towards carbon neutral world

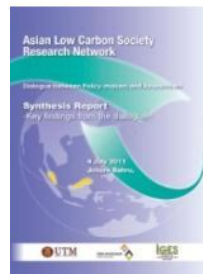
Stakeholders in charge

- Policy makers
- Policy implementers
- Public (citizen) as consumer of materials and services
- City and local municipality as provider of Infrastructure for living and economic activities
- Industries as creator of added value
- Supply chain as connector between consumer and production
- Financial communities as assistant for activities by funding
- Civil society as advocator, NGO, facilitators
- Knowledge community as advisor and agent of change

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An open network of researchers & research organizations, as well as like-minded relevant stakeholders that facilitates the formulation and implementation of science-based policies for low-carbon development in Asia.

Lessons learnt from activities and outcomes from dialogues between Researchers and Policy-makers in Asia



Synthesis Reports: <http://lcs-rnet.org/publications/index.html>



Seven Asian priority topics discussed: “GHG inventories as bases”; “policy-making processes and use of integrated assessment models”; “land use and forestry”; “low-carbon cities”; “local level practices/ decisions / initiatives”; “institutionalization of low-carbon green growth”; and “technology for leapfrogging”.

2012 October, Bangkok (LoCARNet 1st Annual Meeting)

planning ⇒ 2014 Nov. 24-26 Bogor, Indonesia (LoCARNet 3rd Annual Meeting)

after 40 years : result of rapid infrastructure construction



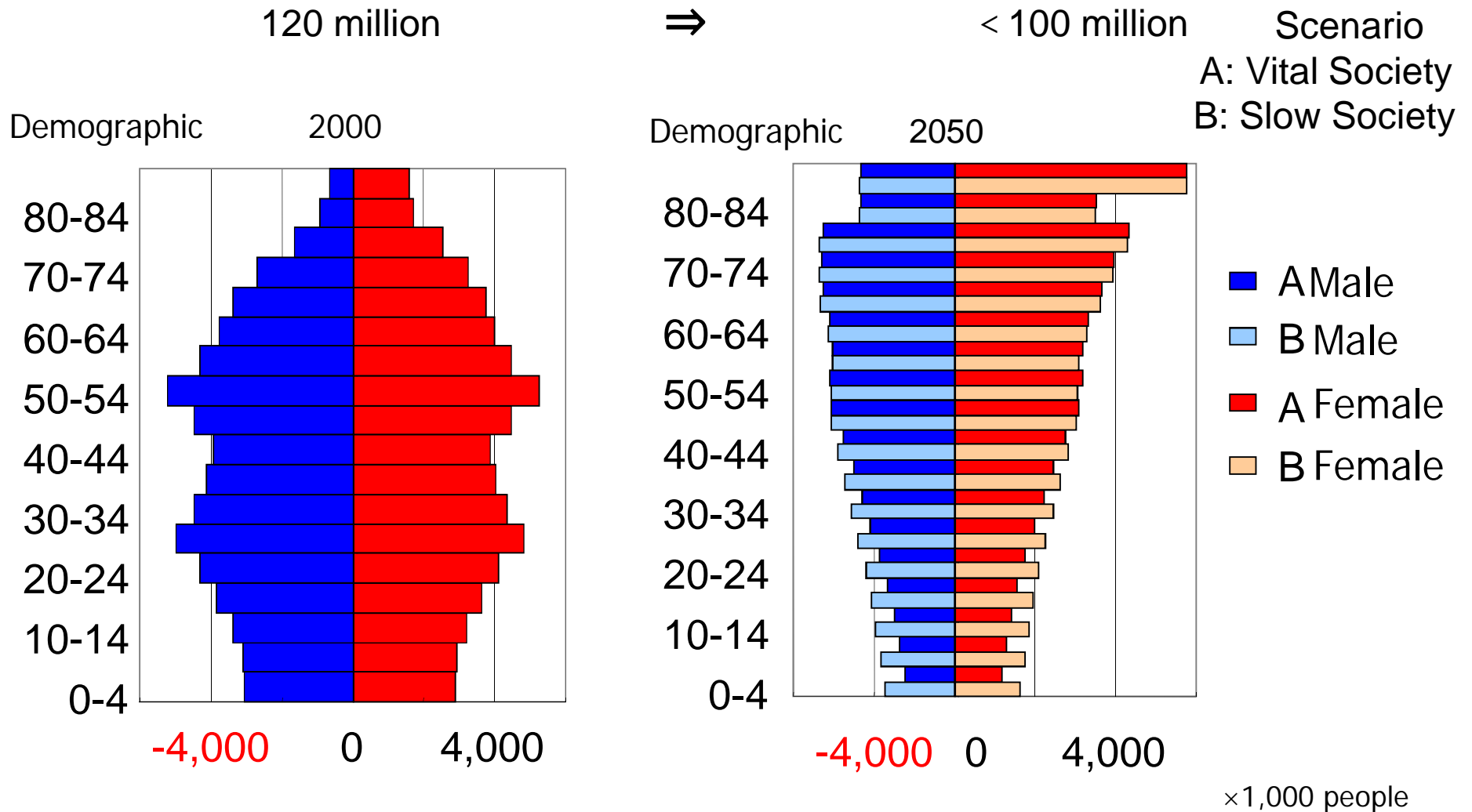
*Now aged society
in problem*

Future compact city



Source: Local Development WG team

Japan as the global front runner of aging societies



LoCARNet – Working Policy

- **Network of leading researchers/experts** who are deeply involved in low-carbon development policy processes in Asia
- **Science-Science-Policy Dialogue**: LoCARNet promotes research and training for policies towards low-carbon development by enabling a sufficient amount of dialogue among/between scientists and policy-makers.
- **Ownership of knowledge by countries**: LoCARNet encourages collaboration amongst researchers in-country whose research capacity and scientific knowledge are firmly grounded in their home countries.
- **Regional Collaboration**: LoCARNet aims to increase in research capacity in the AP region through knowledge sharing and information exchange, in the scheme of regional S-S-N cooperation.

LoCARNet Workshops and consultations in Asian countries

Indonesia

Policy-Research Dialogues

- Low-Emission Development Scenarios (LEDs) of Energy Sector: Preliminary Result of Asia-Pacific Integrated Modeling (AIM) exercise (June 2012)
- Indonesia Workshop: Research Cooperation on "Development of Low-Carbon Strategies" (Feb. 2013)



Cambodia

Cambodia Workshop: A Systematic and Quantitative Design of Low Carbon Development Plan for Cambodia (April 2014)



Vietnam

Vietnam Workshop: Low Carbon Society in Vietnam (April 2013)



Thailand

- LoCARNet 1st Annual Mtg. (Oct. 2012)
- Development of Asia Low-Carbon Strategy and Roadmap 1st Kick off Meeting (Oct. 2012)



Malaysia

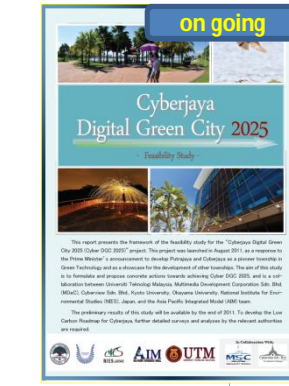
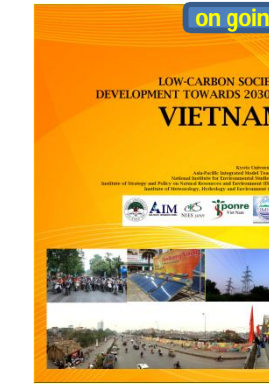
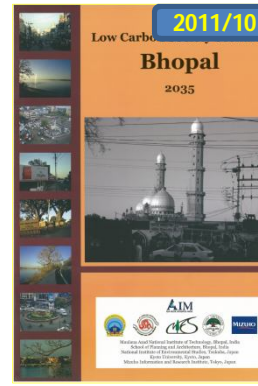
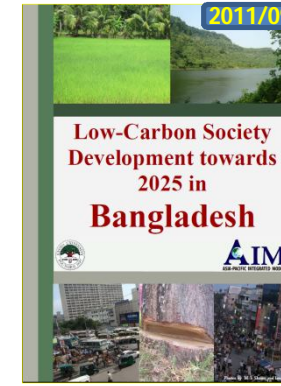
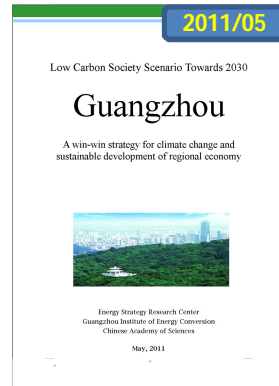
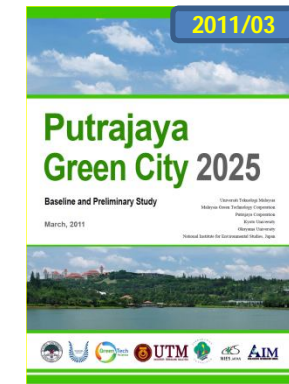
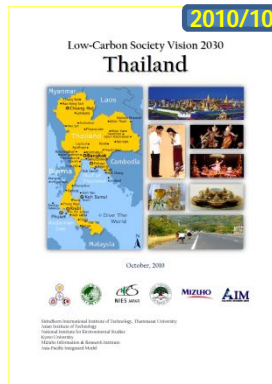
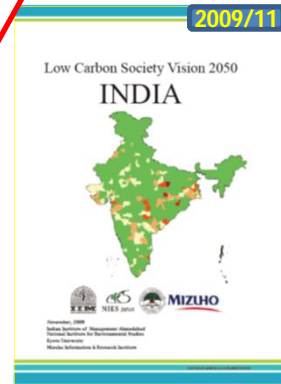
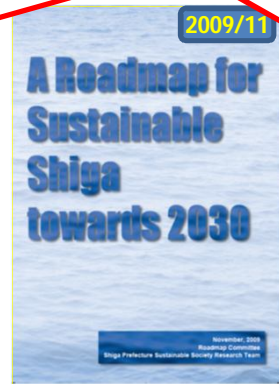
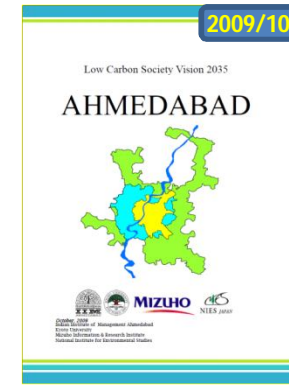
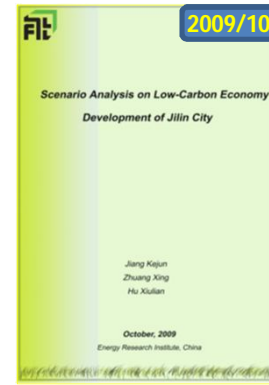
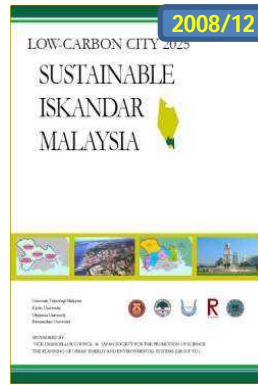
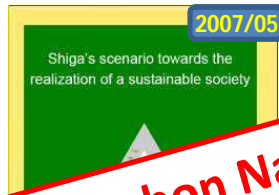
Int'l workshops in Iskandar, Malaysia (2012-2013)



Brochures introducing national and regional specific LCD studies

Communication and feedbacks of LCD study to real world

Low Carbon National/City Scenarios applying Integrated Assessment Model (AIM)



Country reports, Indonesia, Thailand, Malaysia



Cambodian reports



LoCARNet reports



LoCARNet 1st Annual Meeting, October 2012, Bangkok

Asian Low Carbon Development Scenario Making and Capacity Building Activity Since 1991



1st AIM International Workshop on 1-2 February, 1996



15th AIM International Workshop on 20-22 February 2010

**AIM Training WS since 1991
for integrated policy making**



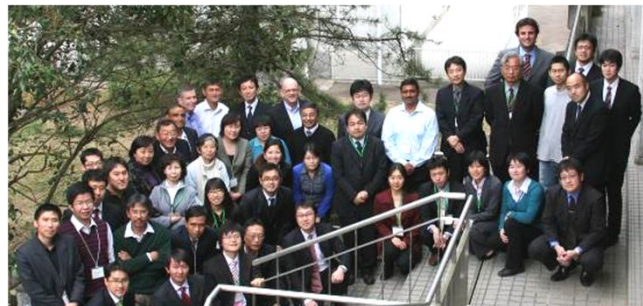
Asian Modeling Meeting at Tsukuba on 17-18 September 2009



17th AIM International Workshop, 17-19, February 2012



AIM Training Workshop on 27-31 October 2008



14th AIM International Workshop on 14-15 February 2009



16th AIM International Workshop on 19-21 February 2011



AIM Training Workshop on 16-20 October 2006



AIM Training Workshop on 2-14 August 2010



AIM Training Workshop on 22-26 October 2007

Future of Low Carbon Asia Research Network Alliance of Centers of Excellence for Low Carbon Development Strategy in Asia

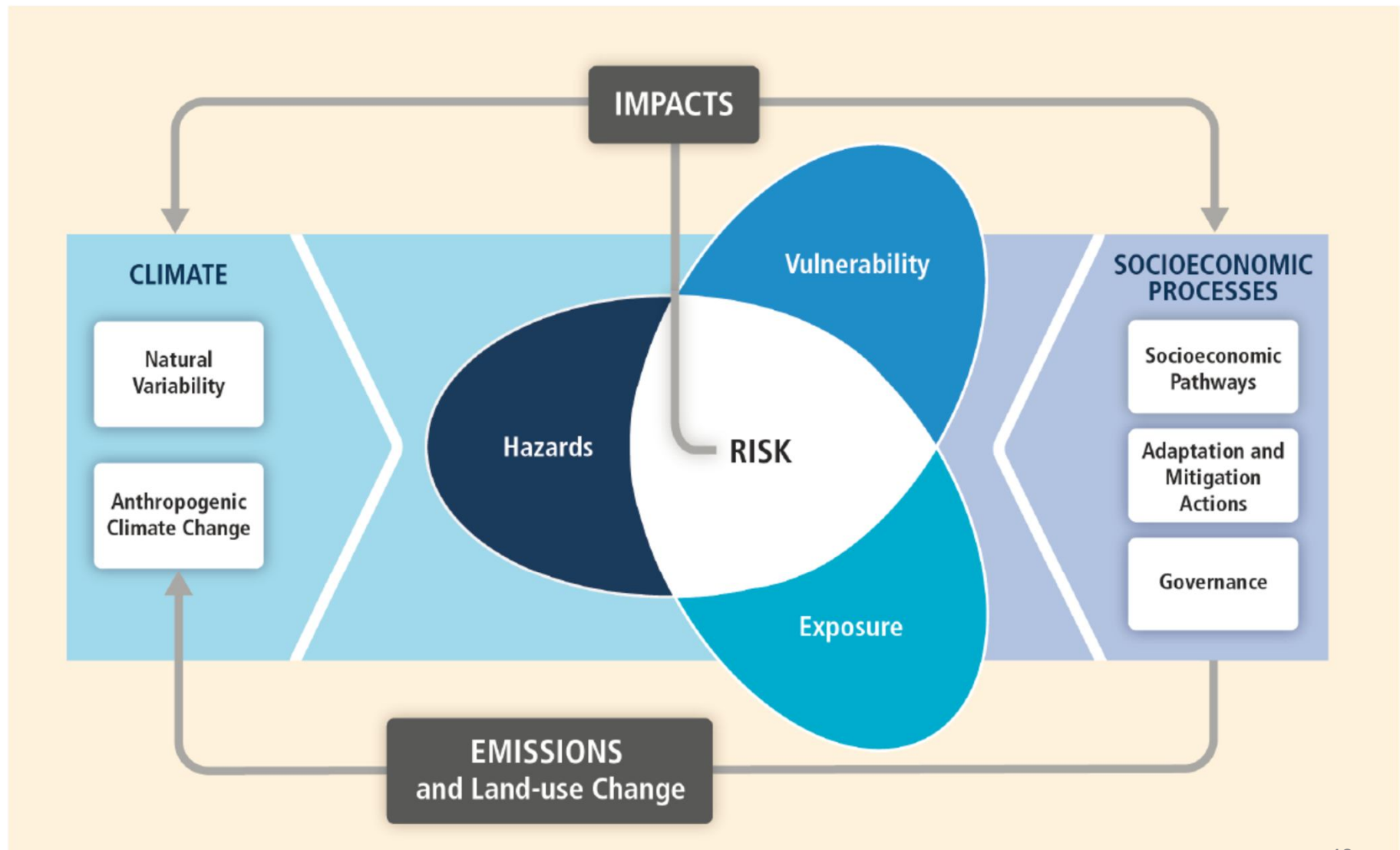


4. 転換のための政策と行動

- **政策手順**：転換を強く促進するためのBackcastingによる**政策タイミング・ロードマップ**づくり
- **気候政策目標 = 2°C以下⇒今世紀末までにCarbon neutralへ⇒エネルギー利用削減・自然エネルギー利用・森林土壌保全・適応策**
 - **エネルギー利用削減**：エネルギー削減行動（SCP）・省エネ/低炭素技術開発普及
- **政策要素**：基礎統計 [インベントリ]、目標設定、予測、計画手法、経済的評価手法、PDCA手法、

今回プログラムとの関係

Risk of climate-related impacts from the interaction of climate-related with the vulnerability and exposure of human and natural systems

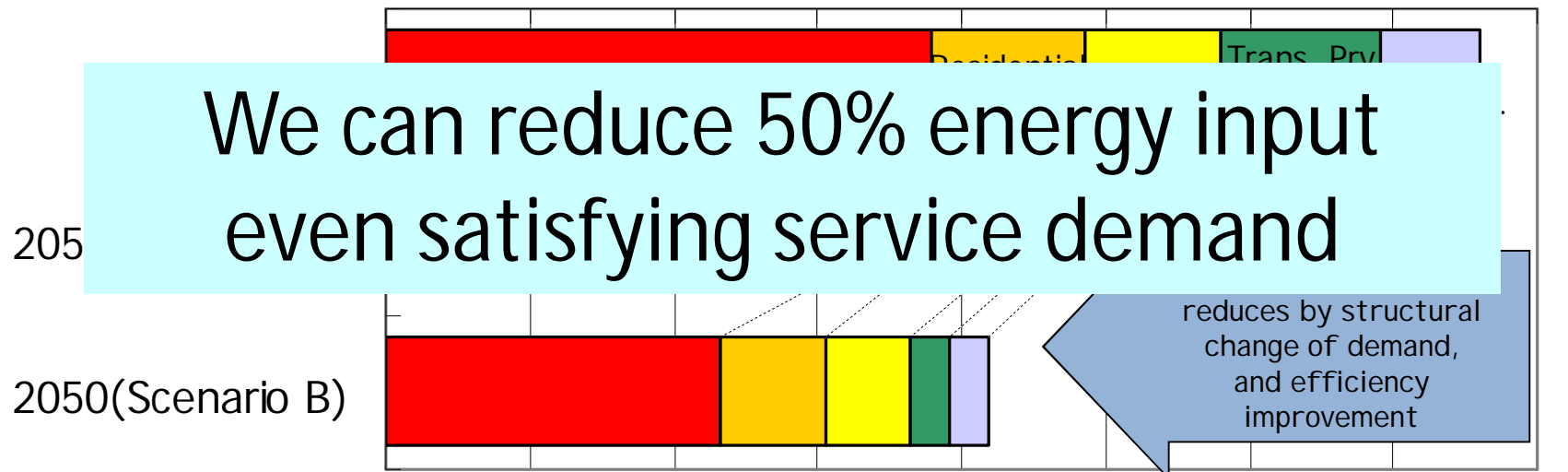


Source: IPCC WGII AR5

Energy demands for achieving 70% reduction of CO₂ emissions

Secondary Energy Demands (Mtoe)

0 50 100 150 200 250 300 350 400



■ Industrial
 ■ Residential
 ■ Commercial
 ■ Trans. Prv.
 ■ Trans. Frg.

Trans.Prv.: Transportation (Private), Trans.Frg.: Transportation (Freight)

Possible energy demands reductions for each sector:

Industry : structural change and introduction of saving energy tech. 20 ~ 40%

Passenger Transport :land use, saving energy, carbon-intensity change 80%

Freight Transport :efficient transportation system, energy efficient 60 ~ 70%

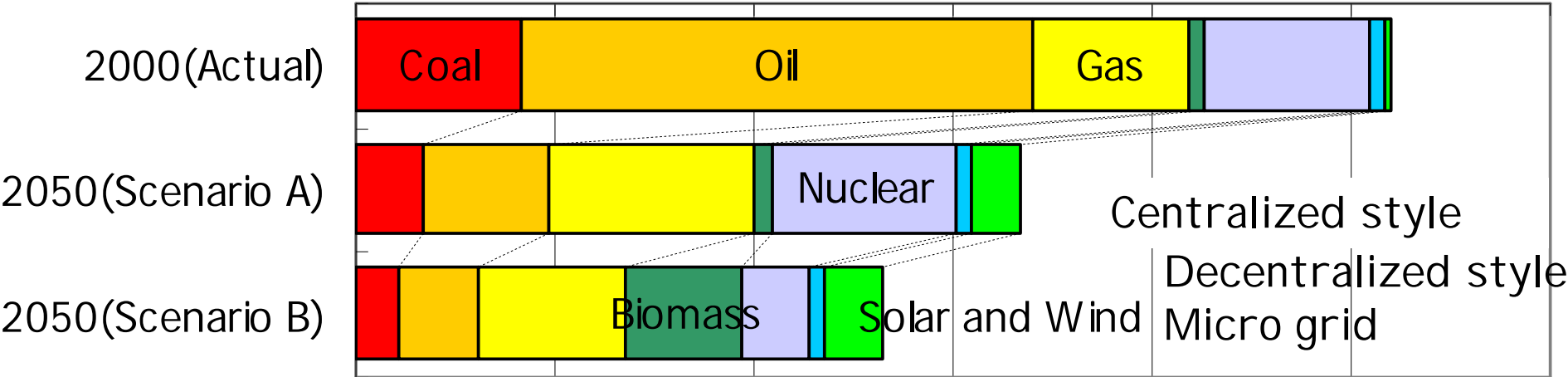
Residential: high-insulated and energy-saving houses 50%

Commercial: high-insulated building and energy saving devices 40%

Energy supply for achieving 70% reduction of CO₂ emissions

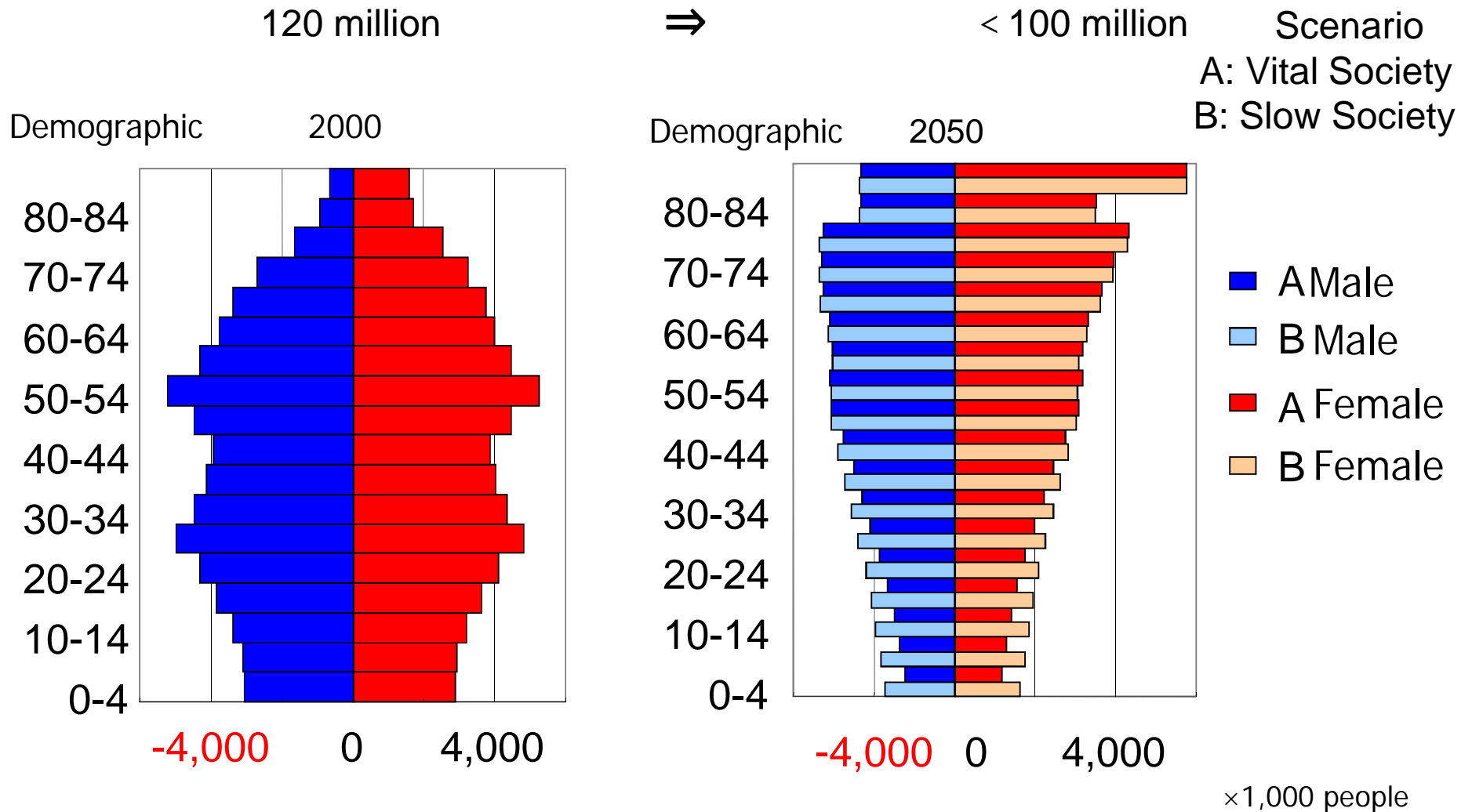
Primary Energy Consumption (Mtoe)

0 100 200 300 400 500 600



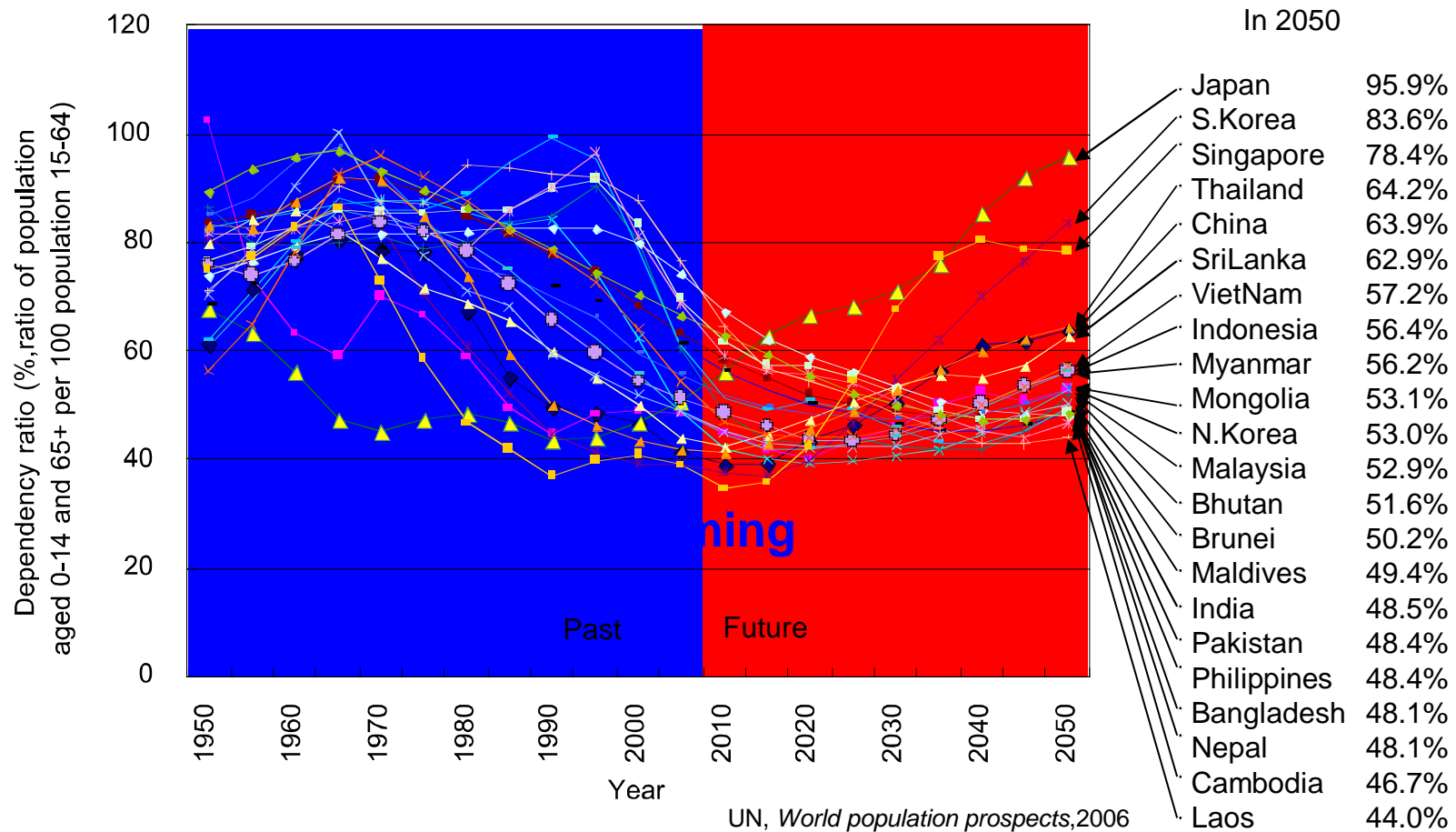
■ Coal
 ■ Oil
 ■ Gas
 ■ Biomass
 ■ Nuclear
 ■ Hydro
 ■ Solar and Wind

Japan as the global front runner of aging societies



Asia 40 years into the future

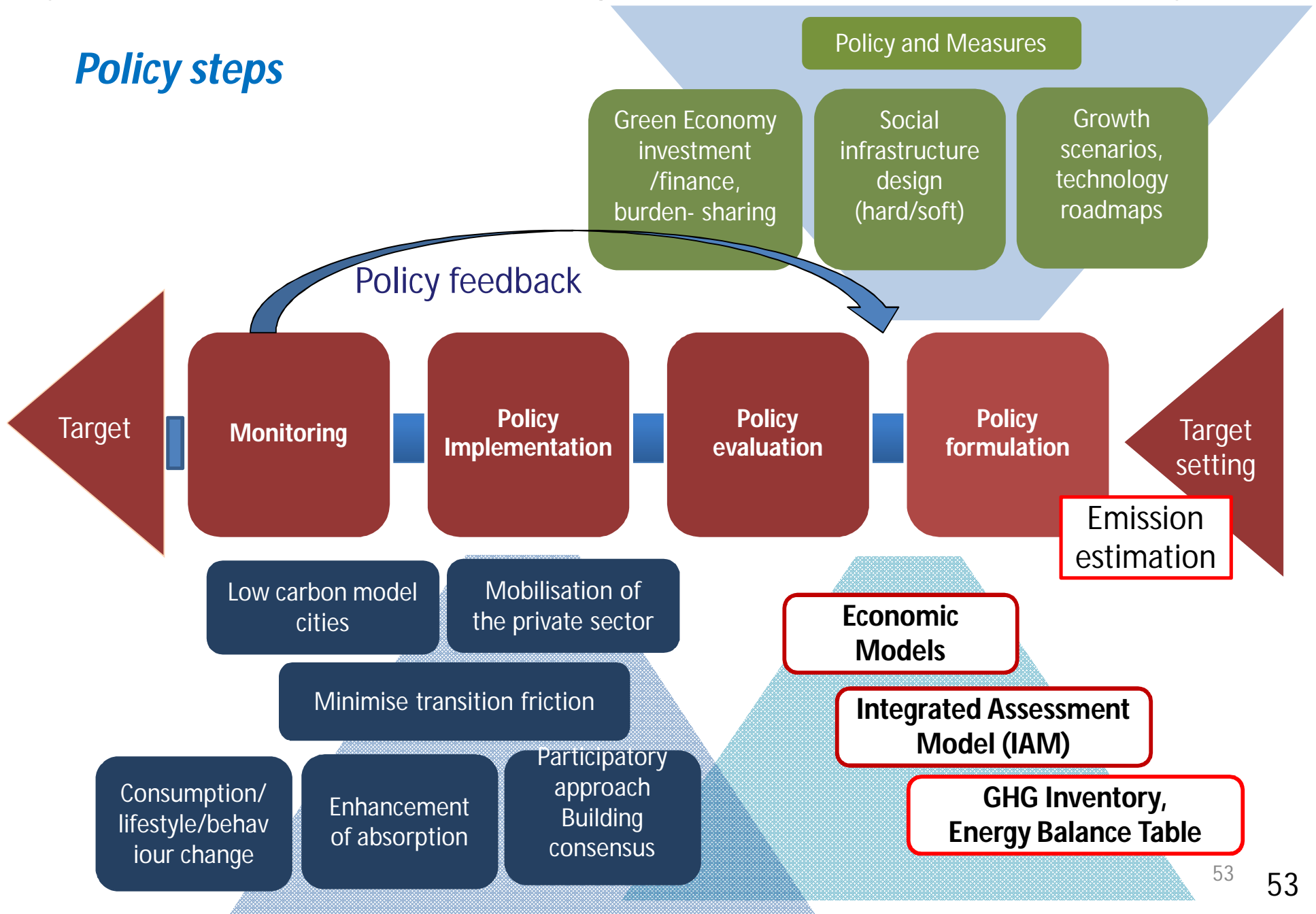
Dependency ratios of population will change drastically over the next forty years



From Matsuoka, 2009

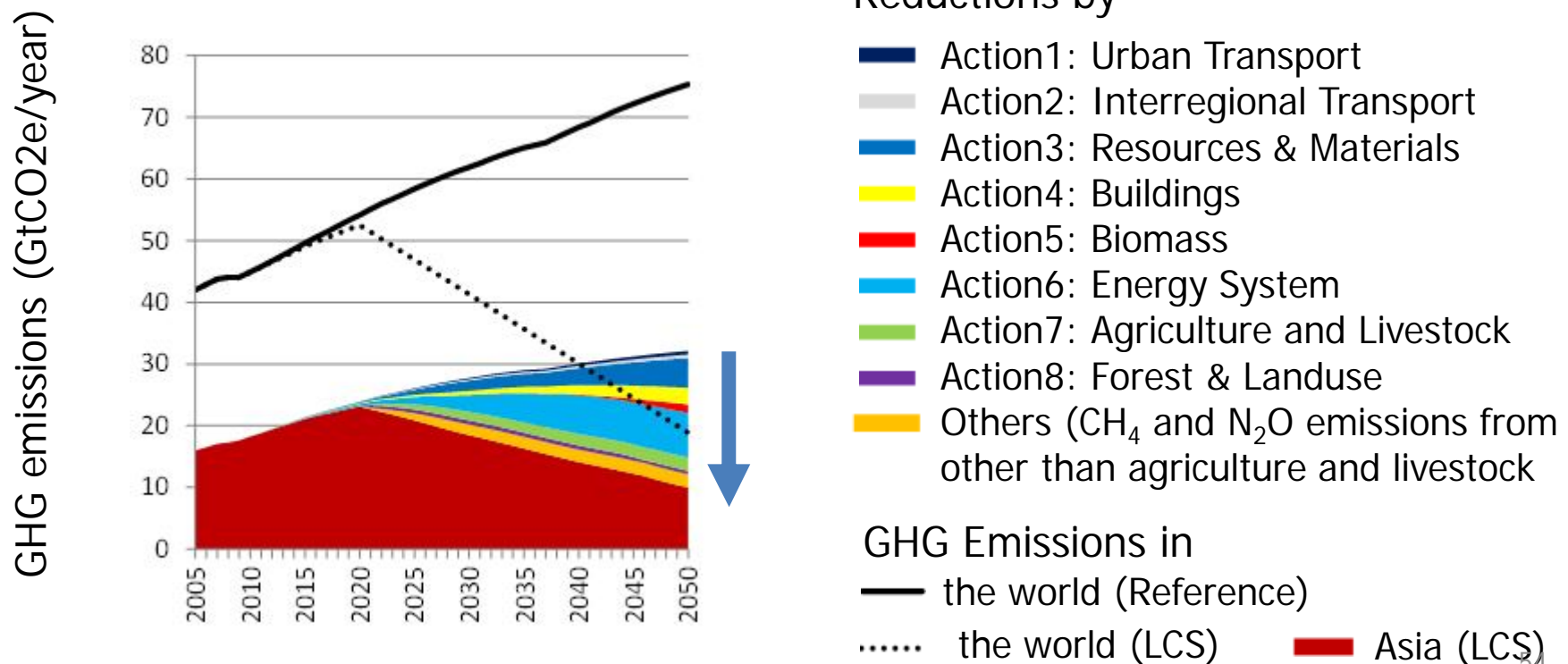
Systematic Steps for formulating low-carbon development policy

Policy steps



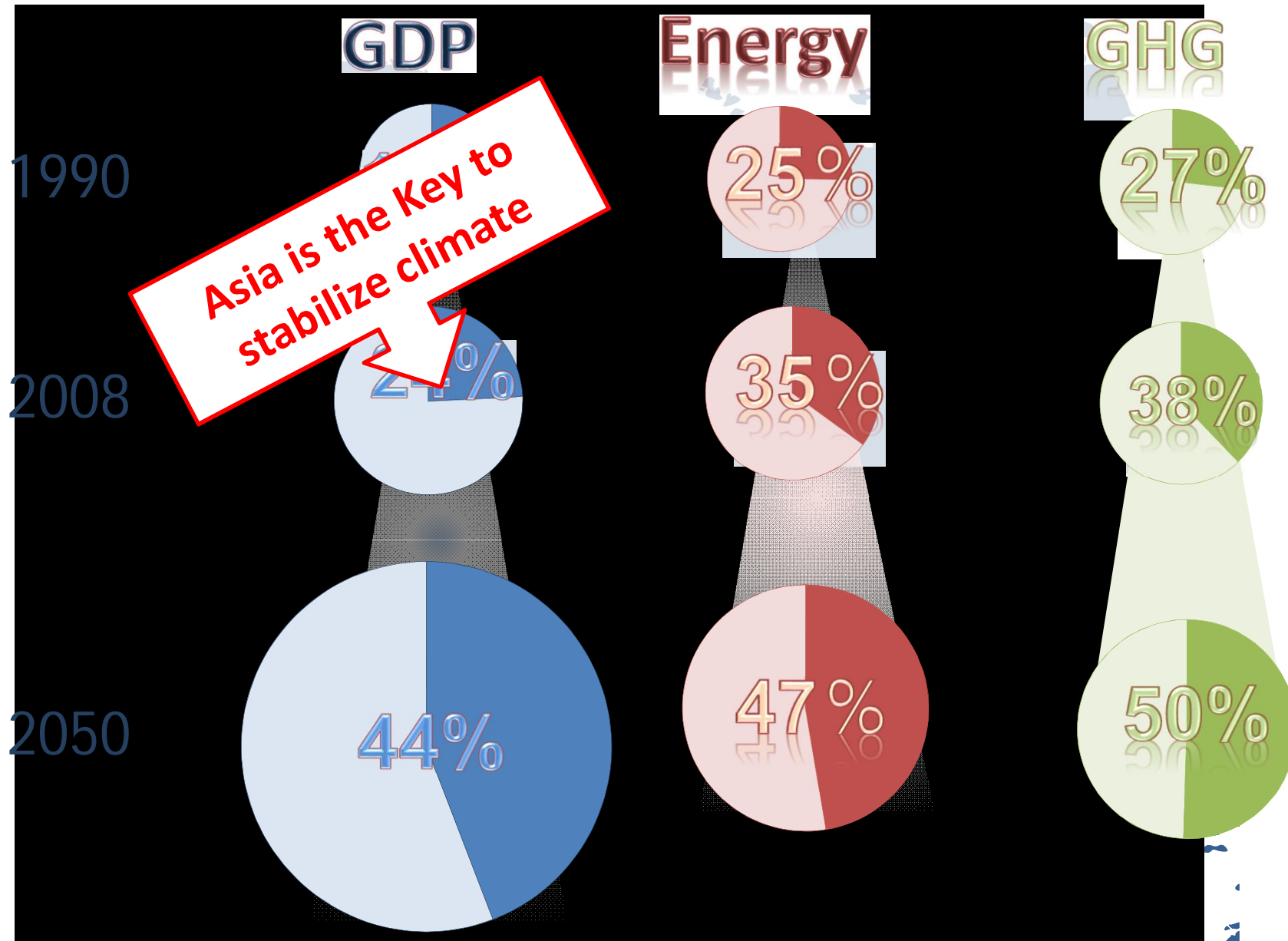
There is **potential to reduce GHG emissions by 69%** compared to the reference case in Asia

- The global emissions will become 1.8 times larger compared to the 2005 level and emissions in Asia will be doubled under the reference scenario.
- It is feasible to reduce GHG emissions in Asia by 69% by introducing ten actions and Others (CH₄ and N₂O emissions from other than agriculture and livestock) appropriately compared to the reference scenario in 2050.



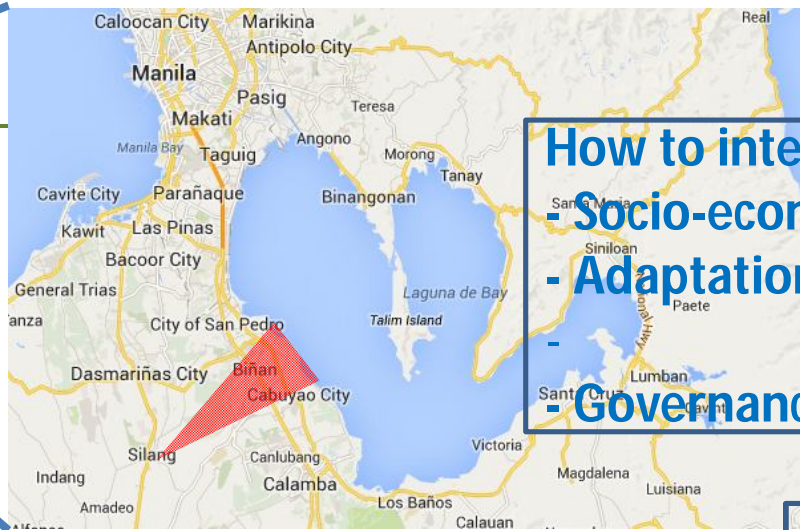
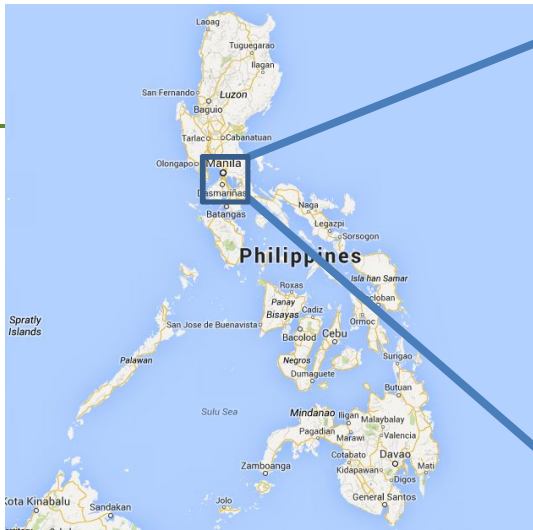
Calculated by Asia Integrated Assessment Model (AIM/NIES)

Growing importance of actions towards low-carbon development in Asia



Source: Presentation by Dr. Mikiko

Target area: Philippines Laguna & Cavite Silang-Santa Rosa River basin



How to integrate wisely

- Socio-economic pathway
- Adaptation & mitigation actions
- Governance

Vulnerability

- Biomass
- Water resource
- Highland ecosystem

Hazard (Climate Variability)

- Natural
- Anthropogenic

Human Pressure

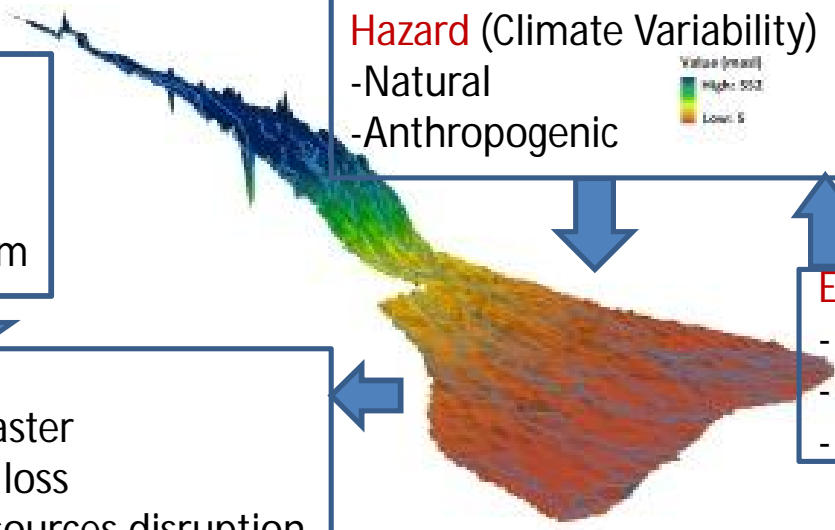
- Migration
- Industrialization
- Resource use

Exposure

- GHG Emissions
- Water/Air Pollutant/
- Land-use change

Risk

- climate disaster
- Ecosystem loss
- Natural resources disruption
- Air/water pollution/Health



Topography

Source: D. Macandog

Participatory Approach



**Nature oriented
healthy society?
Asian wisdom**



Energy dependent
healthy society?
Or...

Response to climate change: Locomotive of new transition

- Environment = Interaction between human activities & nature
- Resolution : MDG: within human society
 - ⇒SDG: human society + nature
 - ⇒CC : **human society within nature**
- Climate: Mother of all natural resources
 - Many SDGs deeply relate to climate: Water, Bio-diversity, Health, Hunger, Conflict,.....
 - “Zero emission”: Only one solution to stabilize climate
 - Ultimate energy supply : Solar energy and its derivative
- Re-recognition of “Human being as a part of nature “
- Zero emission : **Logical (scientific, natural) necessity** (not human logic)