

Environmental Research Fund **S-6** Project

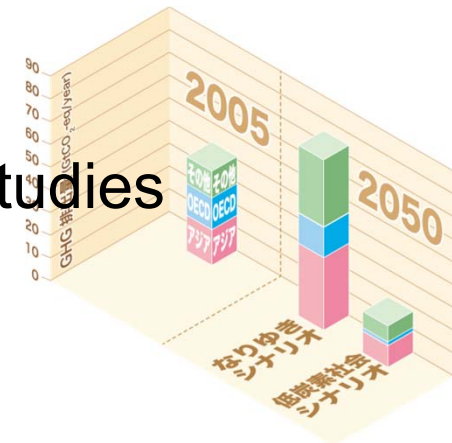


Challenges toward Low-Carbon Society
— Can Asia change the world through leapfrogging?

Progress of Low Carbon Asia Research Project

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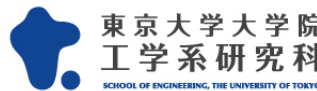
United Nations University
17 October 2013



Organizer

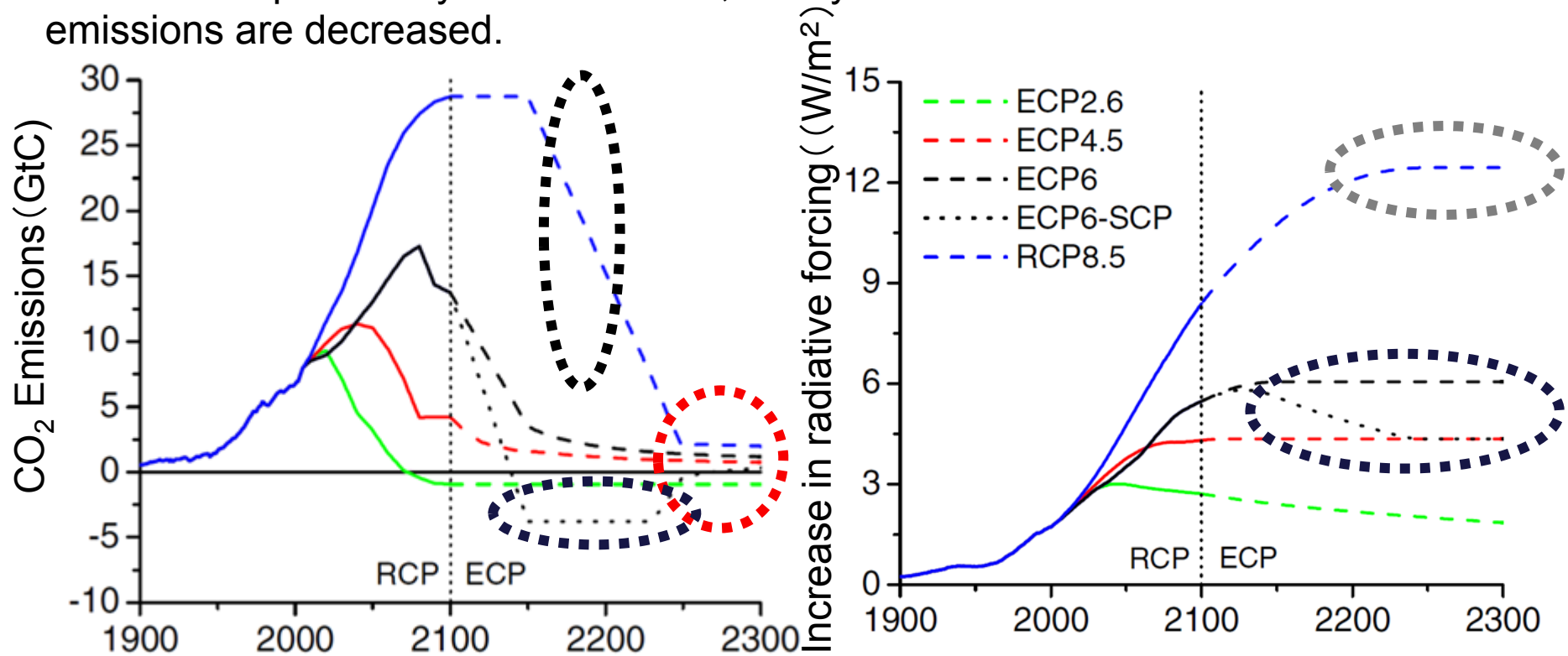


Co-organizer



Why are early actions required ?

- Whatever pathways are followed, GHG emissions should be reduced to zero in the long run. Later the actions become, larger the amounts of reduction become. Temperature will increase as long as GHG emissions are positive.
- GHG emissions should be below zero to decrease temperature. It takes long time.
- It is very difficult to reduce GHG emissions once they are increased because of several reasons, such as the lock-in high carbon infrastructure.
- As climate impacts may be irreversible, it may not be recovered even if GHG emissions are decreased.

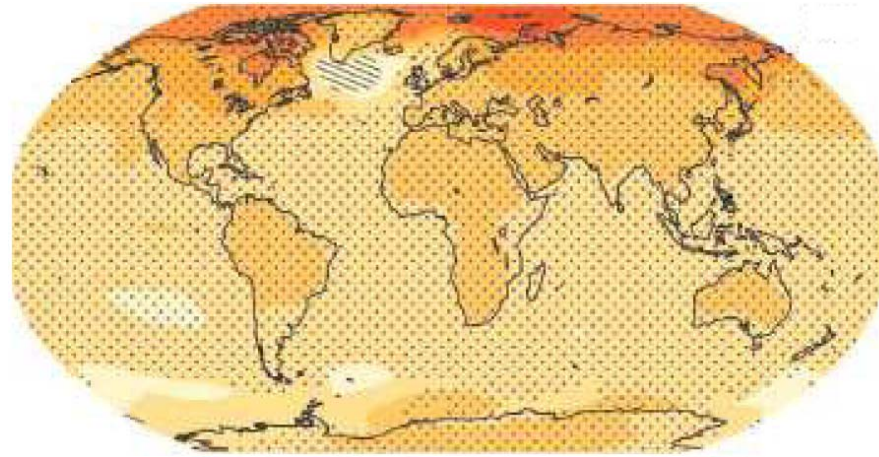


CO₂ emissions pathways in four Representative Concentration Pathways (RCPs) used for IPCC 5th Assessment Report IPCC (left) and corresponding increase in radiative forcing (right).

Without climate policies, the annual average temperature will increase more than 10 degrees Celsius in some regions in a worst scenario.

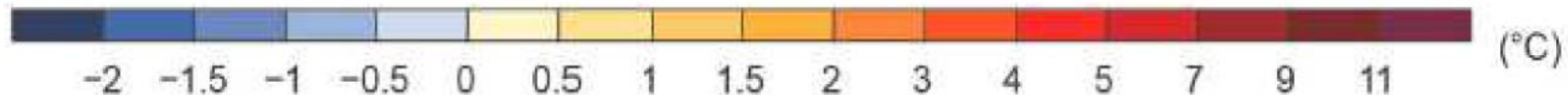
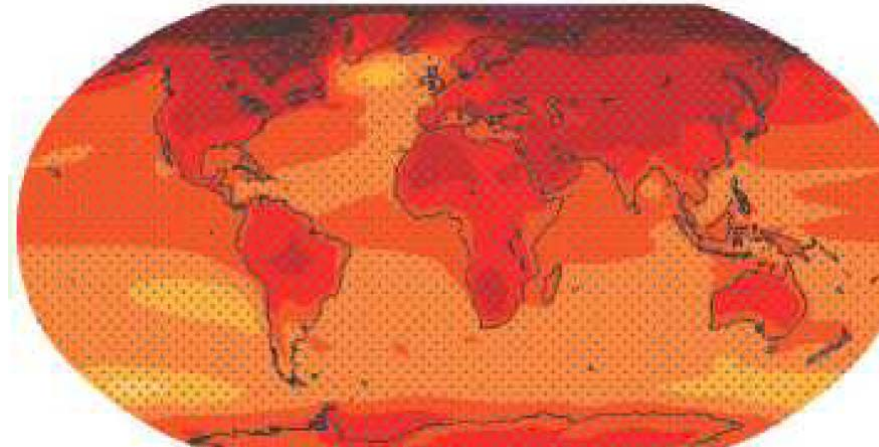
RCP2.6

The global average surface temperature increase 0.3 °C to 1.7 °C in 2100



RCP8.5

The global average surface temperature increase 2.6 °C to 4.8 °C in 2100 and about 8 °C by 2300.

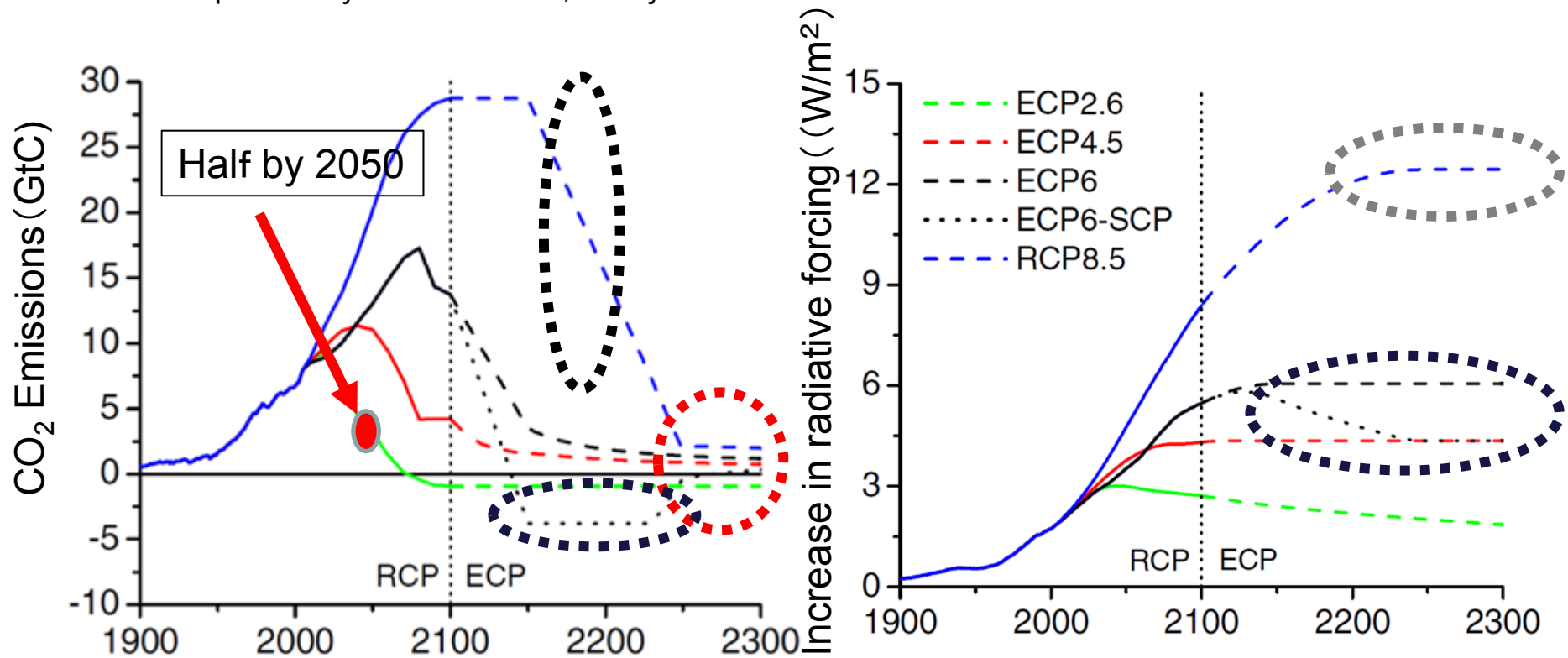


Average surface temperature change (average between 2081 and 2100) compared to the average temperature between 1986 and 2005.

Source: Fig. SPM.7 in Summary for Policy Makers, AR5, IPCC AR5

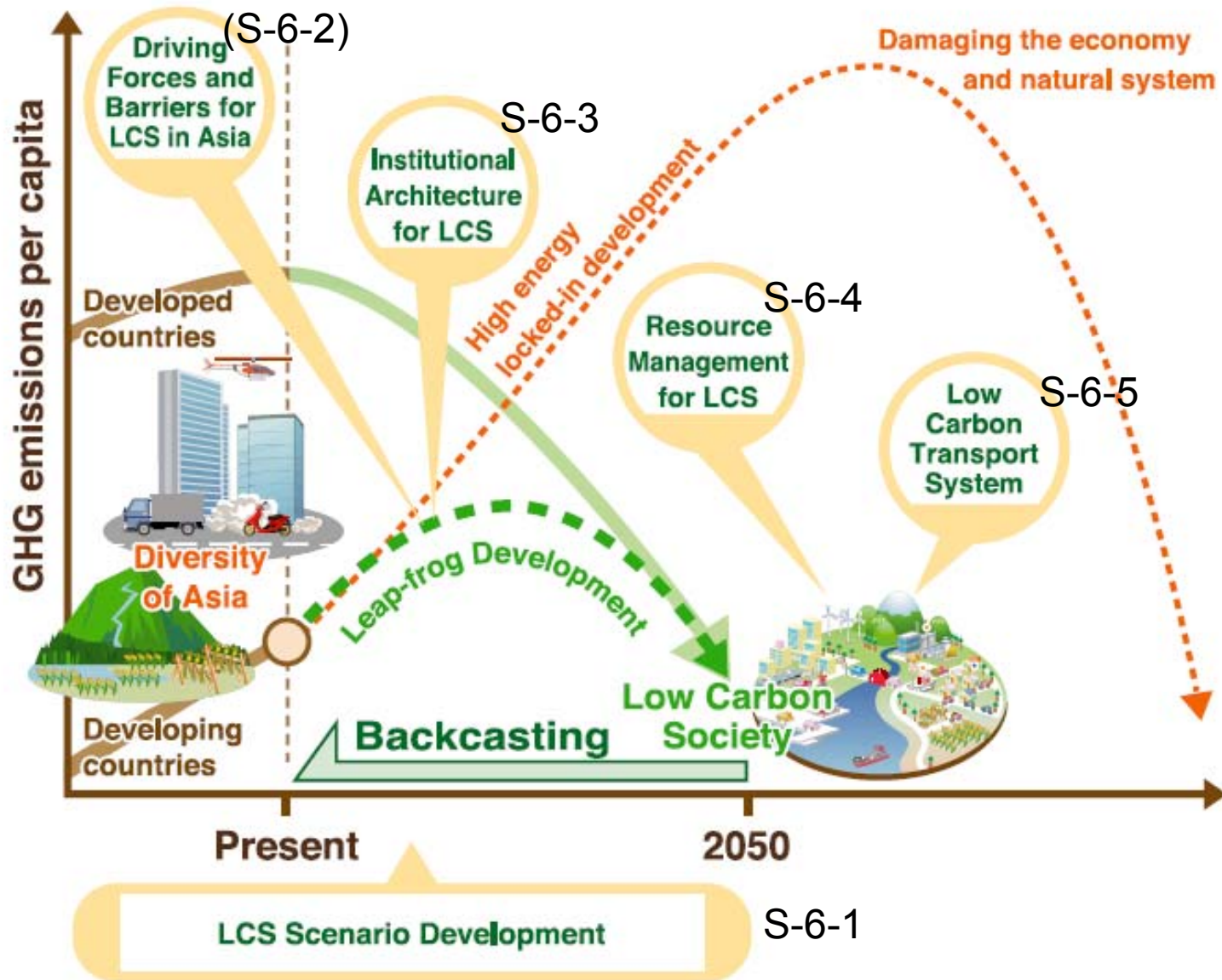
This project explored the pathways toward a low-carbon society where GHG emissions will be halved.

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CO₂ emissions pathways in four Representative Concentration Pathways (RCPs) used for IPCC 5th Assessment Report IPCC (left) and corresponding increase in radiative forcing (right).

Asia Low-Carbon Research Project (S-6)



Key Questions

- 1) How much will GHG emissions increase by 2050 in the Reference Scenario ? How much is the share of the emissions from Asia?
- 2) How much will GHG emissions from Asia need to be reduced to halve global emissions by 2050?

What are key actions?

- What are effective actions from the points of resource productivity? (Session1 : S-6-4: Yuichi Moriguchi)
- What are strategies and instruments for low carbon transport systems in Asia? (Session1: S-6-5: Yoshitsugu Hayashi)
- What are effective strategies to reduce CO₂ emissions from energy system, buildings, agriculture and livestock, and forest and landuse? (Session2: S-6-1: Toshihiko Masui)

Key Questions

(Continued)

- 4) What kinds of institutions and governance need to be introduced to achieve Low-Carbon Society?

(S-6-3: Norichika Kanie)

- 5) How to approach to promote research collaboration with researchers/organizations in Asia to develop low-carbon scenarios?

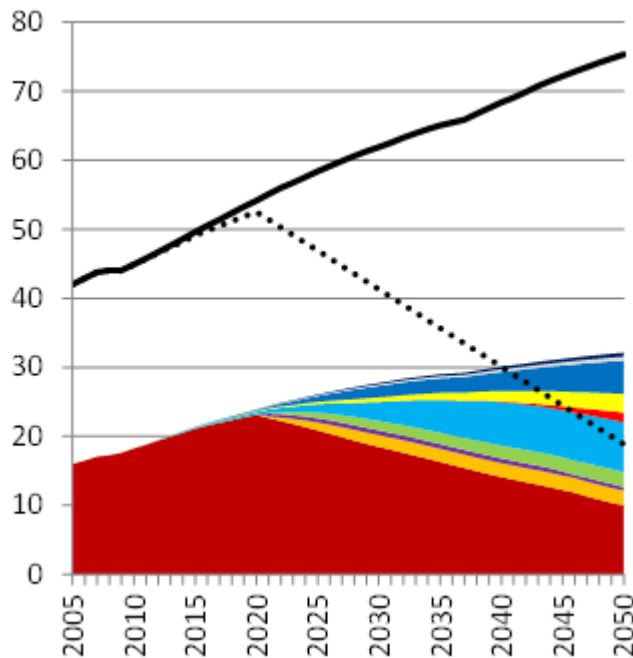
(Session2: S-6-1: Yuzuru Matsuoka)

- 6) How to promote collaboration with other projects and research networks to implement low-carbon scenarios?

Change in GHG emissions with 10 actions 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.

GHG emissions (GtCO₂e/year)



Reductions by

- Action1: Urban Transport
- Action2: Interregional Transport
- Action3: Resources & Materials
- Action4: Buildings
- Action5: Biomass
- Action6: Energy System
- Action7: Agriculture and Livestock
- Action8: Forest & Landuse
- Others (CH₄ and N₂O emissions from other than agriculture and livestock)

GHG Emissions in

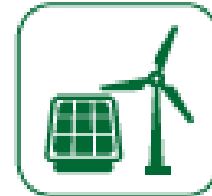
- Asia (LCS)
- the world (LCS)
- the world (Reference)

Ten Actions towards Low Carbon Asia are proposed



Action 1 Urban Transport

Structured Compact City



Action 6 Energy System

Low carbon energy system with local resources



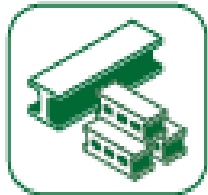
Action 2 Interregional Transport

Mainstreaming trains and water transportation



Action 7 Agriculture & Livestock

Spread of high yields and low emission agricultural technologies



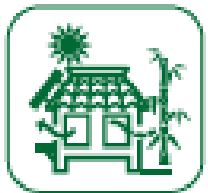
Action 3 Resources & Materials

Smart material use that realizes the full potential of resources



Action 8 Forest & Landuse

Sustainable forest management



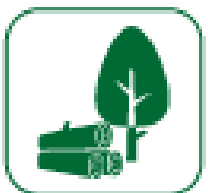
Action 4 Buildings

Smart buildings that utilize natural systems



Action 9 Technology & Finance

Technology and finance to facilitate achievement of LCS



Action 5 Biomass

Local production and local consumption of biomass



Action 10 Governance

Transparent and Fair Governance that Supports LCS Asia

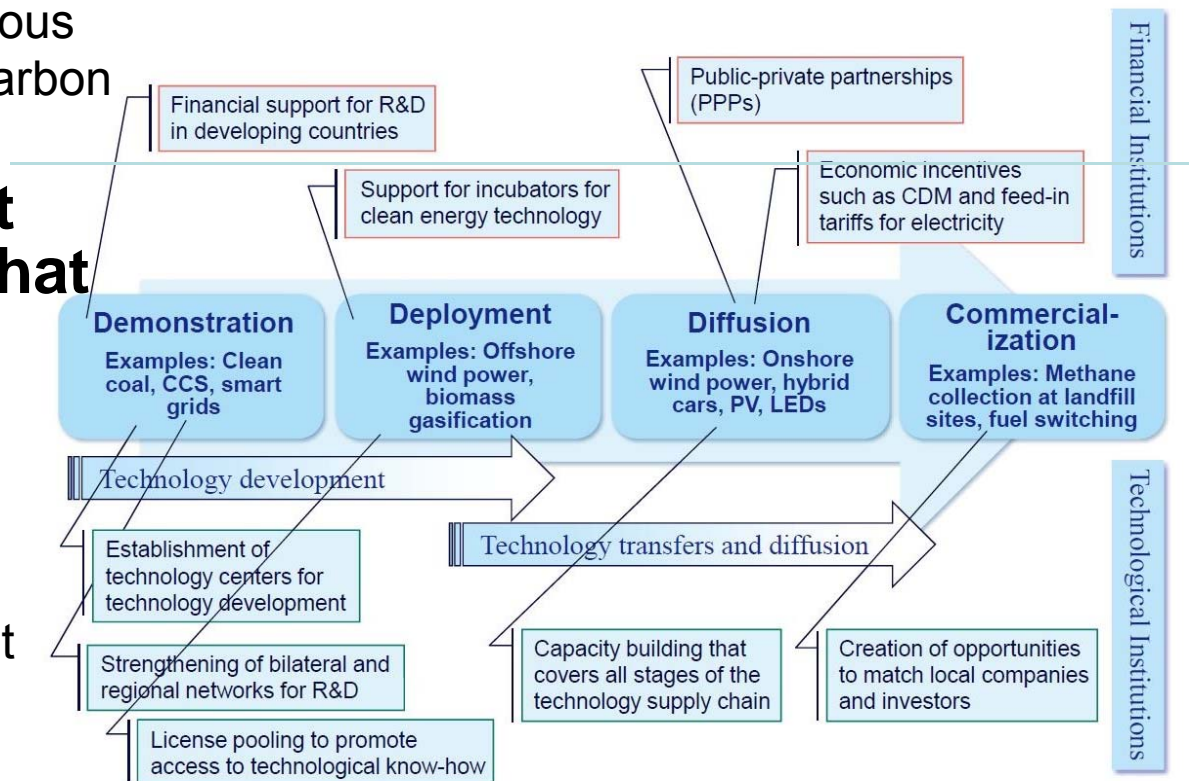
Proposal from the Governance team

Action 9: Technology and Finance for a Low-Carbon Society

- Promote private-sector R&D for LCS
- Establish adequate funding to support R&D and technology diffusion,
- Foster environmentally conscious consumers who choose low carbon products.

Action 10: Transparent and Fair Governance that Supports Low Carbon Asia

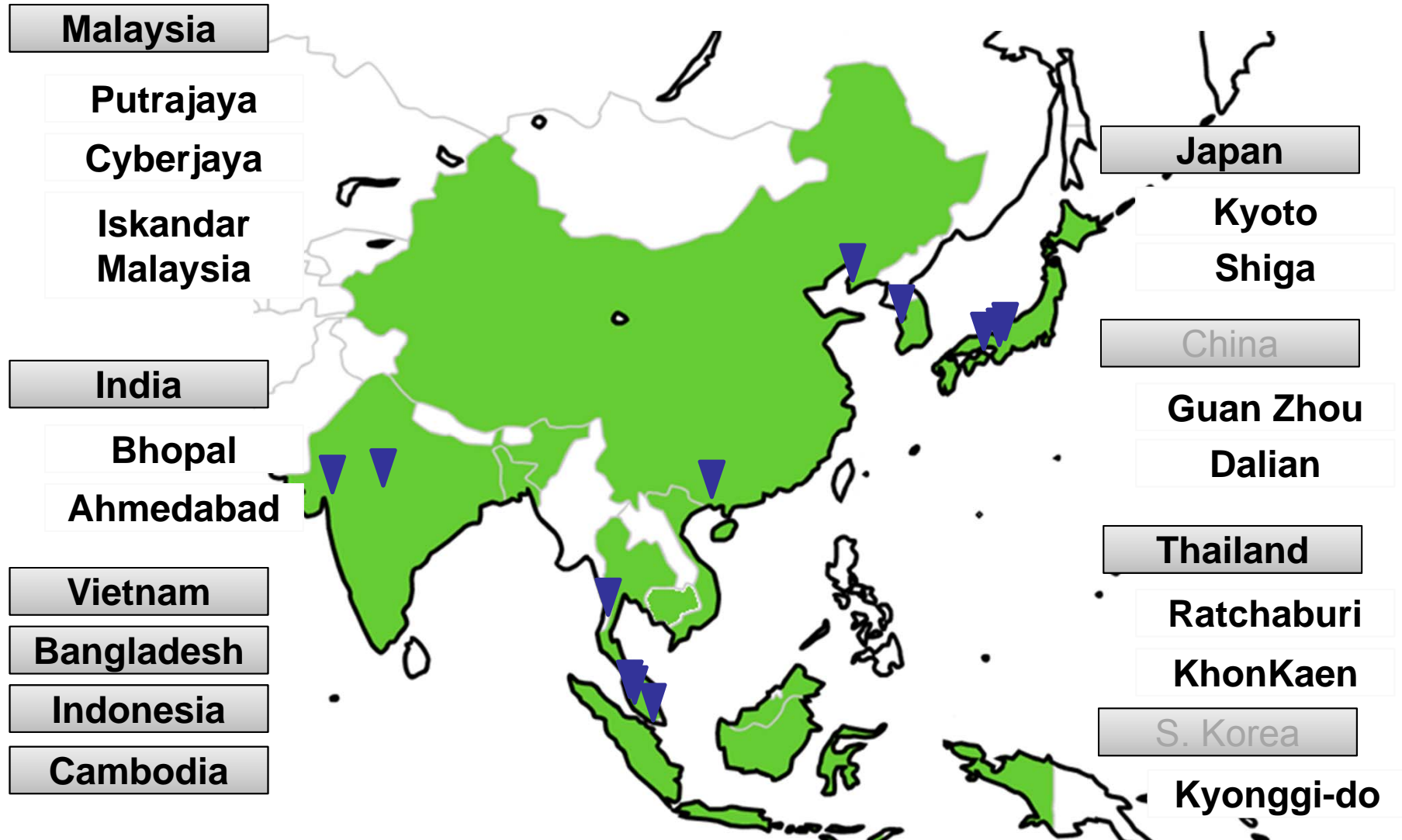
- Create an efficient administrative management framework
- Establish fair and transparent business practices,
- Improve literacy with respect to environmental policies and technologies.



Examples of technological and financial institutions for each stage in the technology life cycle (barriers to technology deployment vary significantly by technology, country, and region)

Collaboration with researchers/ organizations in Asia

Up to now, we applied our LCS research approach to 8 nations and 12 regions in Asia regions



Challenges to scenario implementation and expansion of research collaboration

- Strengthening the collaboration with researches in Asian countries such as China, India, Indonesia and Thailand
- Collaboration with other projects
 - SATREPS project: Collaboration with University of Technology, Malaysia and Iskandar development agency
 - Policy NAMA development project
 - New training center by TGO/JICA in Thailand
 - East Asia Knowledge Platform for Low Carbon Growth
 - Carbon Asia Network (LoCARNet)



The 2nd LoCARNet Annual Meeting, Yokohama, 24-25 Julv 2013

Findings, proposals and challenges

- 1) Global GHG emissions are estimated to increase from 42 GtCO₂e in 2005 to 75 GtCO₂e, about 1.8 times larger than that in 2005. The emissions in Asia will be doubled from 16 GtCO₂e in 2005 to 32 GtCO₂e in 2050. The share of Asian emission in the global one was 35% in 2005, and it is estimated to grow 43% in 2050.
- 2) In order to reduce the global emission by half by 2050, the emissions from Asia needs to be reduced by 69% from the reference scenario. It is about 62% of GHG emissions in 2005.
- 3) Ten actions are proposed to reduce GHG emissions in Asia by 69% by 2050. They are actions on urban transport, interregional transport, resources & materials, buildings, biomass, energy system, agriculture & livestock, forestry & land use, Technology & finance and governance. The contribution to GHG reduction of each action is quantified by CGE model.

Findings, proposals and challenges

Continued

- 4) Low-carbon scenarios for 8 nations and 12 regions in Asia have been developed with the collaboration with researchers/organizations in Asia.
- 5) Considering the need of the Asian countries to address a number of environmental and development concern in parallel, it is necessary to identify leapfrogging development pathways and co-benefits to enable a shift to low carbon emissions and low-resource consumption societies, while simultaneously improving the economic standards of living.
- 6) Implementing low carbon scenarios, it is vital to collaborate with other projects and networks working on low carbon societies.

Thank you very much!

<http://2050.nies.go.jp/s6>



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