Different pathways to low carbon society:

Impacts of CC to resources for development

COP22 Marrakesh November 2016

Shuzo Nishioka

Low Carbon Asia Research Network

Institute for Global Environmental Strategies, Japan

Japan in May

LoCARNet: Low Carbon Asia Research Network

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 develop 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

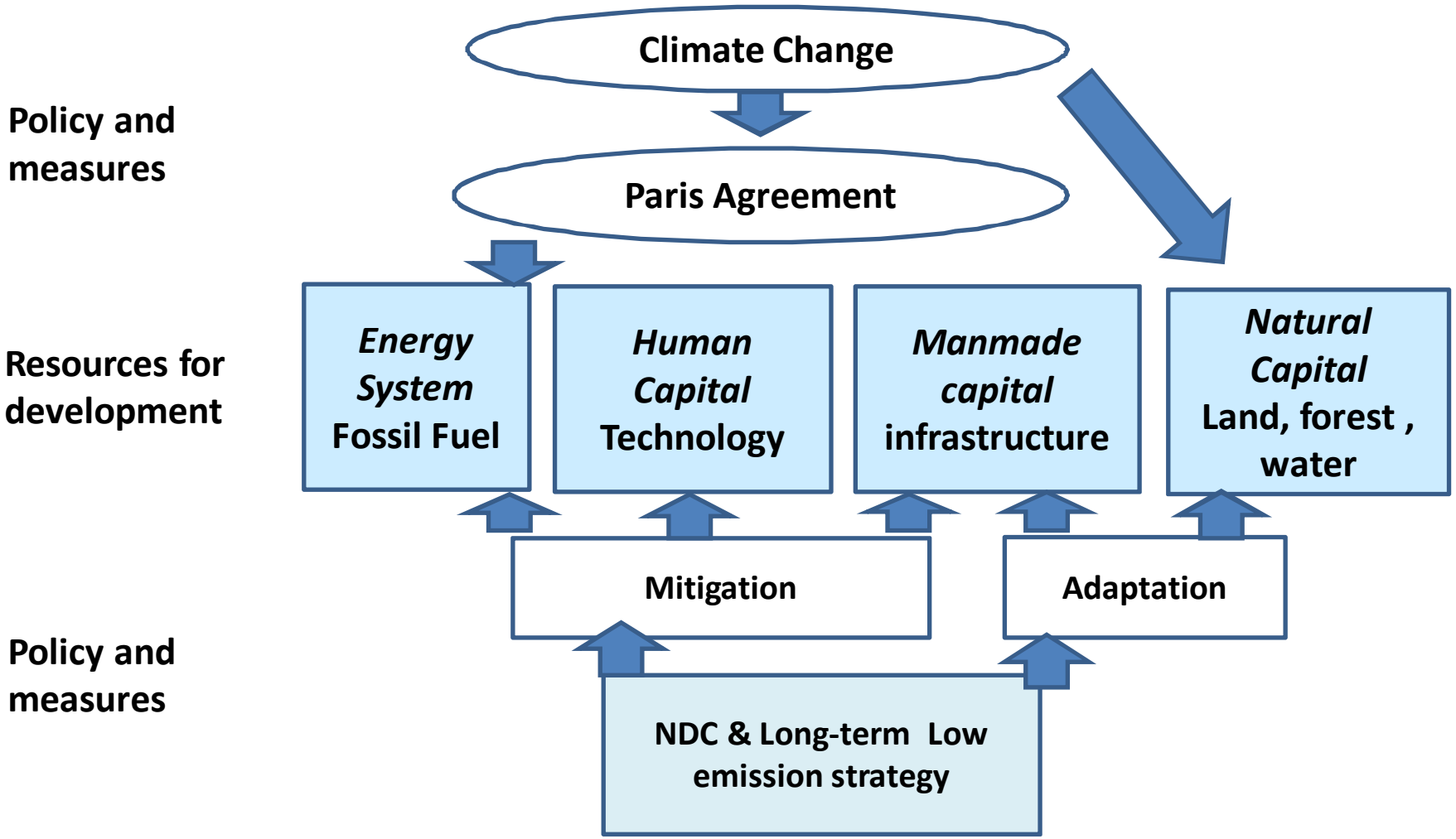
Seven Asian priority topics discussed: "GHG inventories as bases"; "policy-making processes and use of integrated assessment models"; "land use and forestry"; "low-carbon cities"; "local level practices/ decisions / initiatives"; "institutionalization of low-carbon green growth"; and "technology for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

2012 October, Bangkok (LoCARNet 1st Annual Meeting)

2016 Oct. 25-26 Bandung, Indonesia (LoCARNet 5th Annual Meeting)

Climate Change:
Impact to Resources for Development

Discussed at 5th Annual Meeting



Major Decision of Paris Agreement at COP21 (2015)

- Set target of less than 1.5/ 2.0 degree temperature rise from pre-industrial period

- All parties participate to take action under NDC

  ⇒**Transform to Zero-emission society**

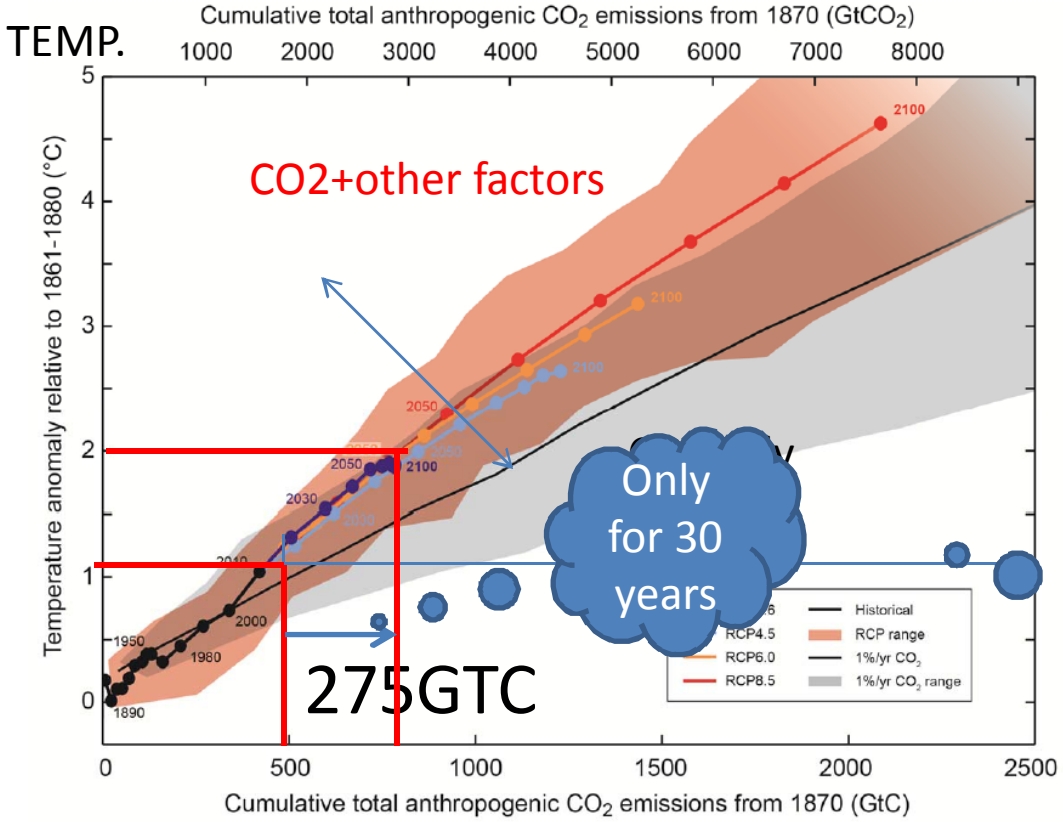
  by the end of this century

  ⇒long-term low GHG emission strategies

- Strengthen cooperation for capacity building in mitigation and adaptation

- Mobilize stakeholders in all levels to act immediately

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



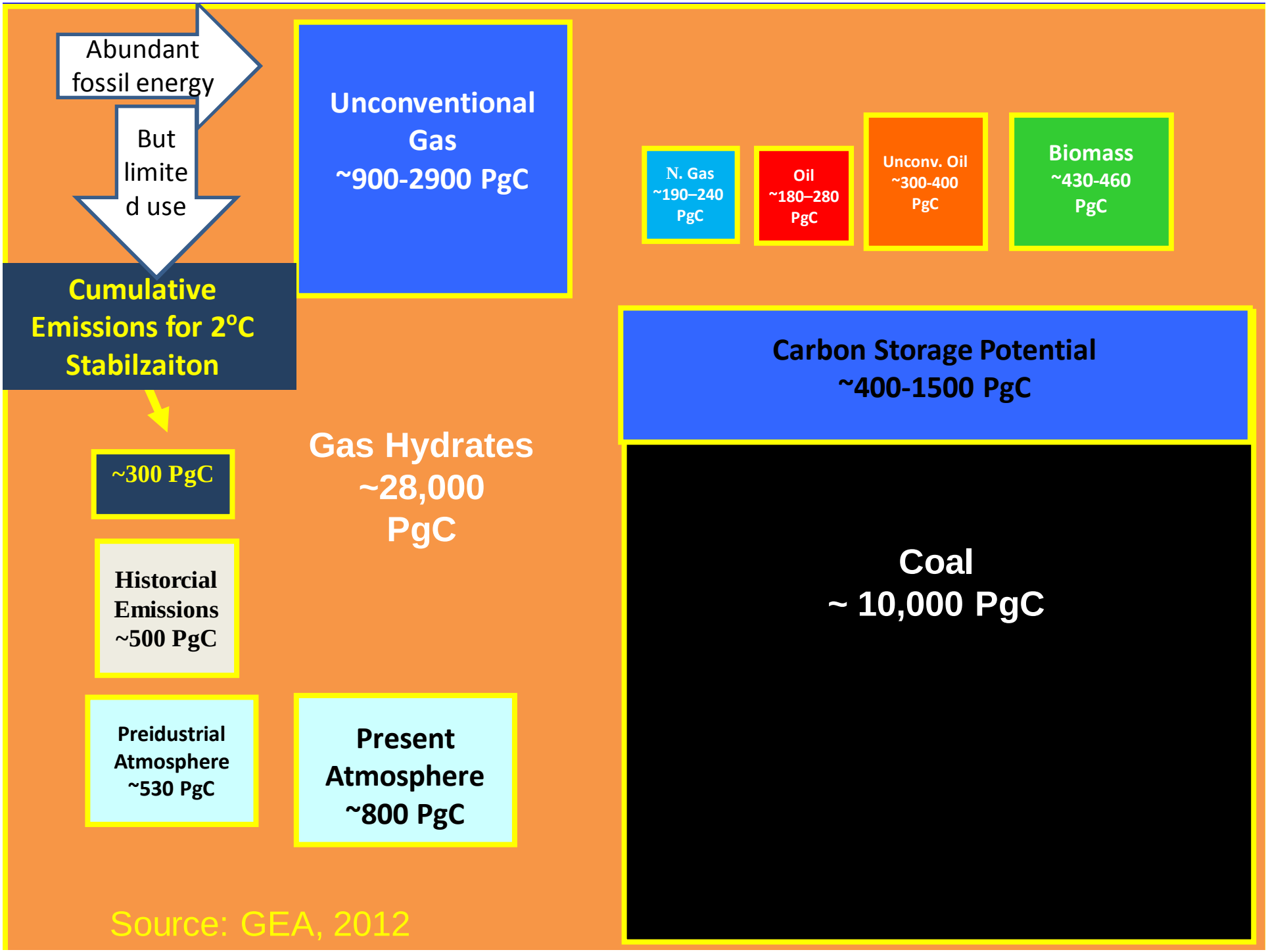
Allowable budget

- 2℃ ⇒ 790 GtC
- 515GtC emitted already
- only 275GtC remained
- 2013 emission= 9.9GtC

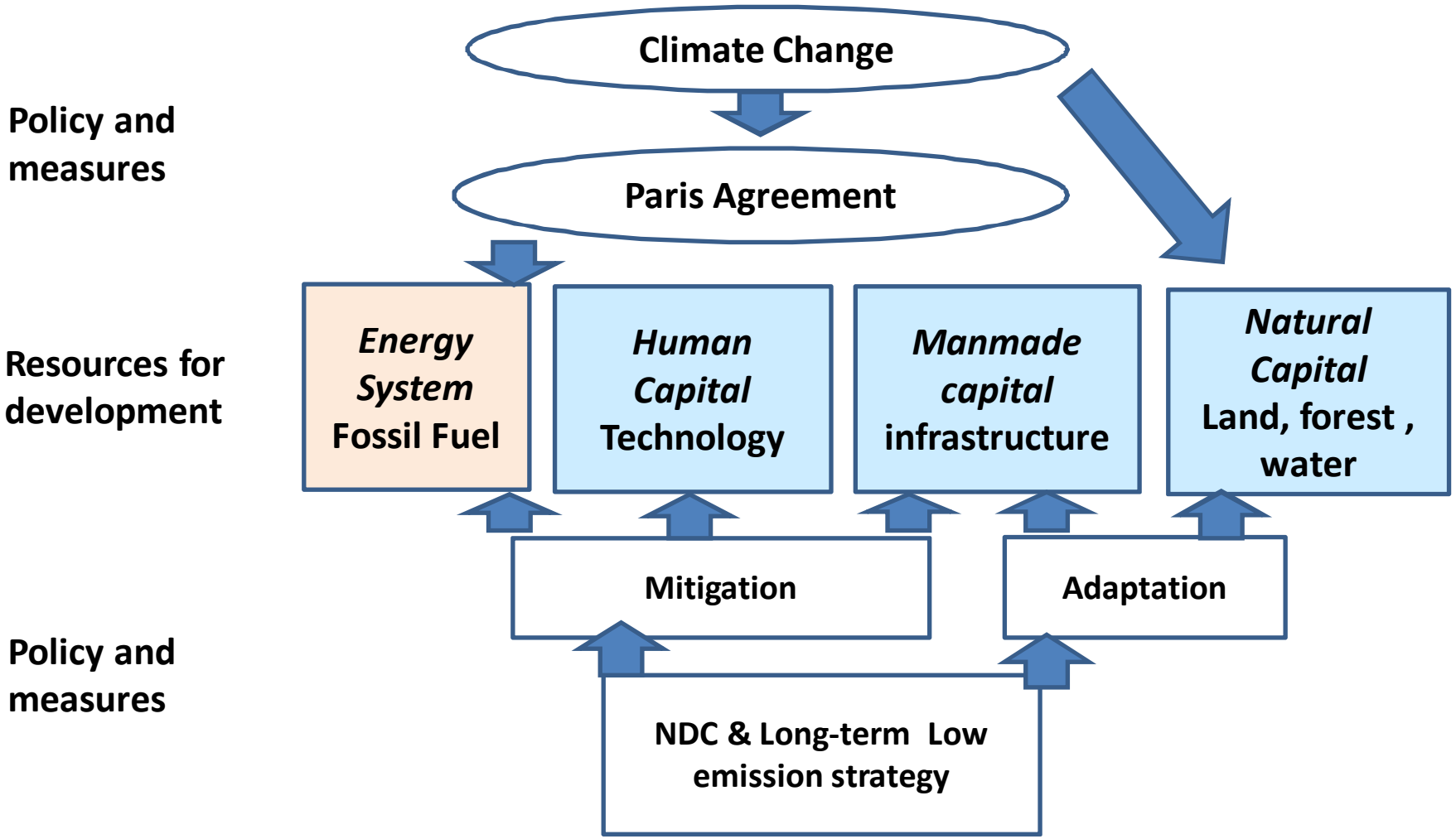
Transition to low carbon society within 50-100 yr.

Cumulative total anthropogenic CO2 emission from 1870 (GtCO2)

(IPCC AR4 and Emori, NIES)

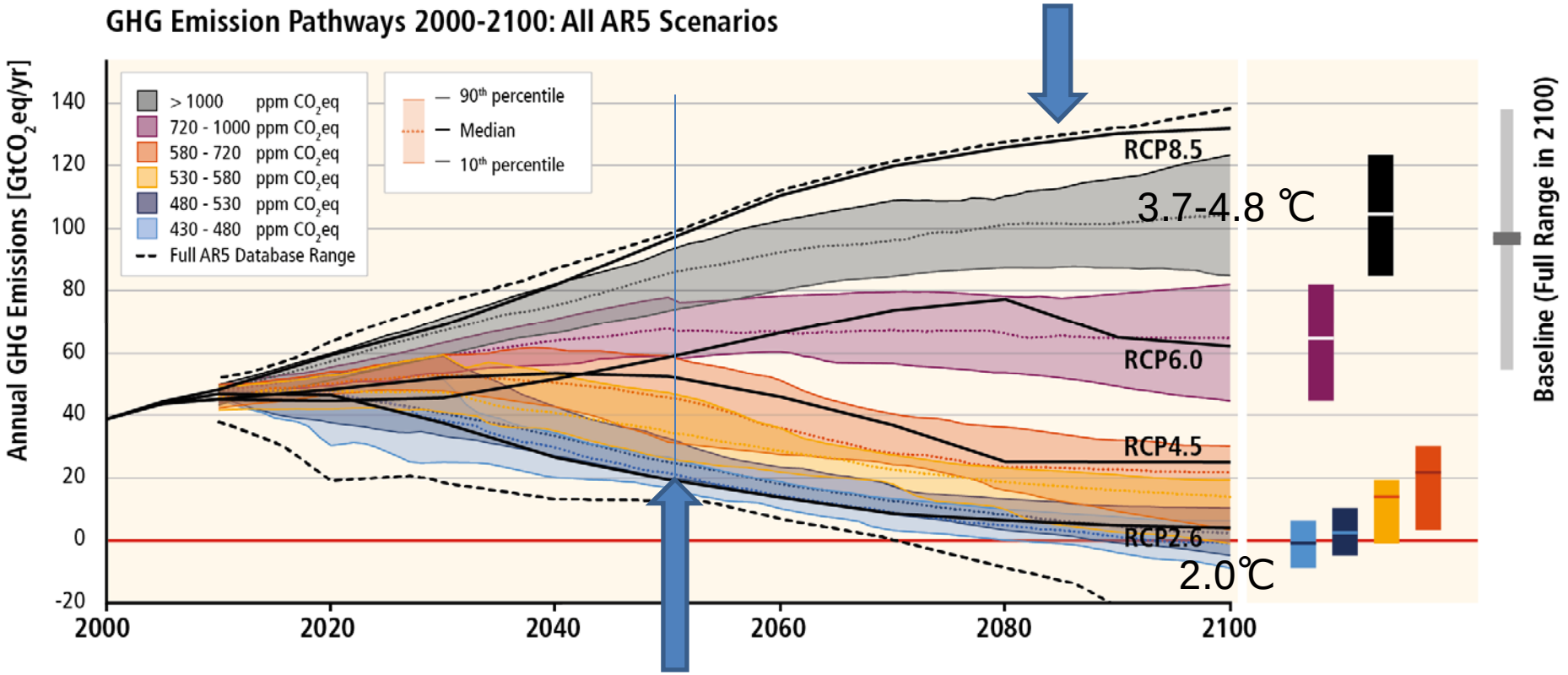

Abundant fossil energy
But limited use
Cumulative Emissions for 2°C Stabilzaiton
~300 PgC
Historcial Emissions ~500 PgC
Preidustrial Atmosphere ~530 PgC
Present Atmosphere ~800 PgC
Unconventional Gas ~900-2900 PgC
N. Gas ~190–240 PgC
Oil ~180–280 PgC
Unconv. Oil ~300-400 PgC
Biomass ~430-460 PgC
Gas Hydrates ~28,000 PgC
Carbon Storage Potential ~400-1500 PgC
Coal ~ 10,000 PgC
Source: GEA, 2012

Climate Change:
Impact to Resources for Development



Global target: Halving current emission by 2050

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



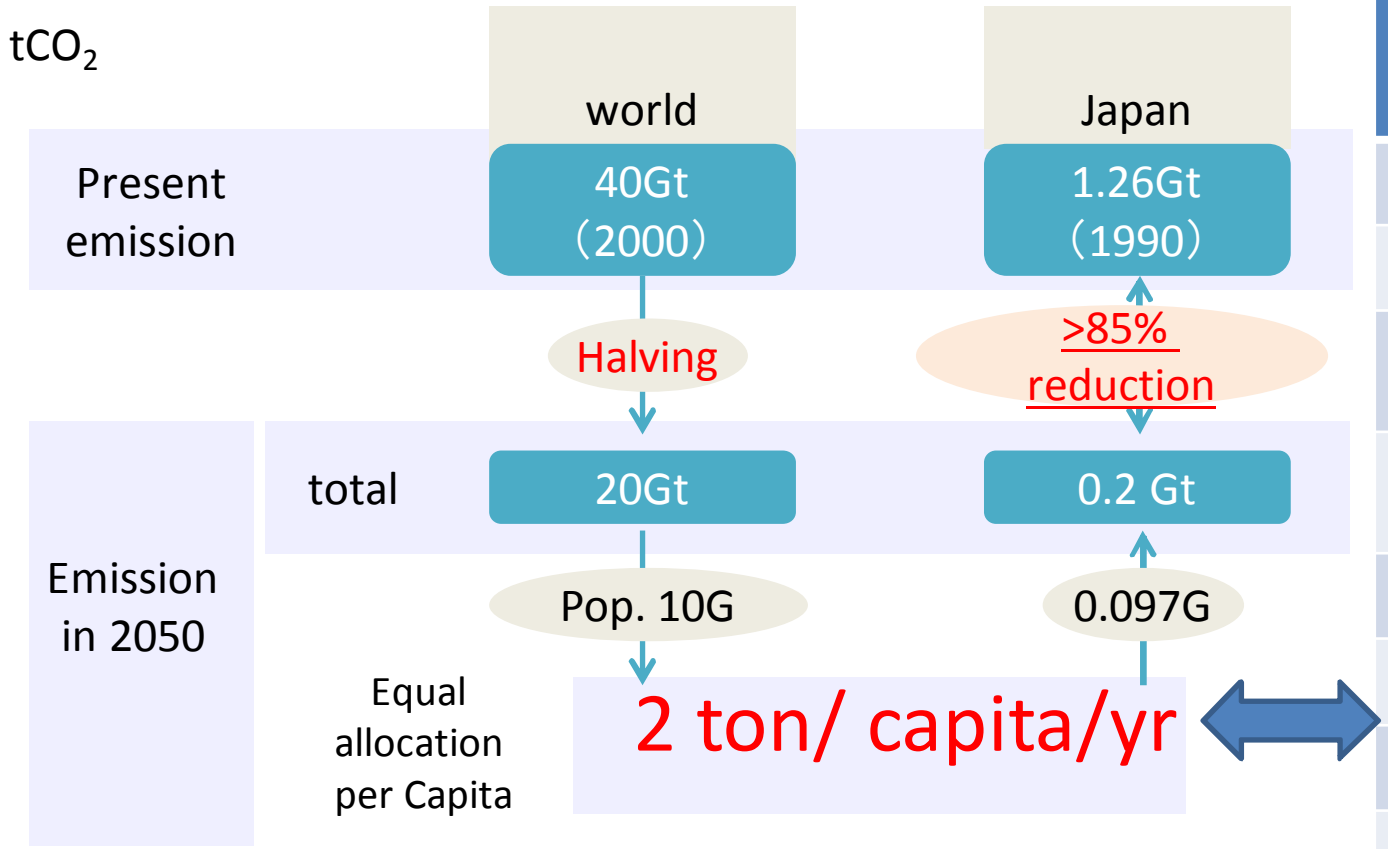
To avoid 2 degree rise, path of passing 50％ reduction from now in 2050 is feasible and reasonable .

IIPCC AR5 2013

Towards 2ton/Capita world

2℃ Target⇒Halving in 2050 worldwide⇒ 2 tCO_2 /Capita

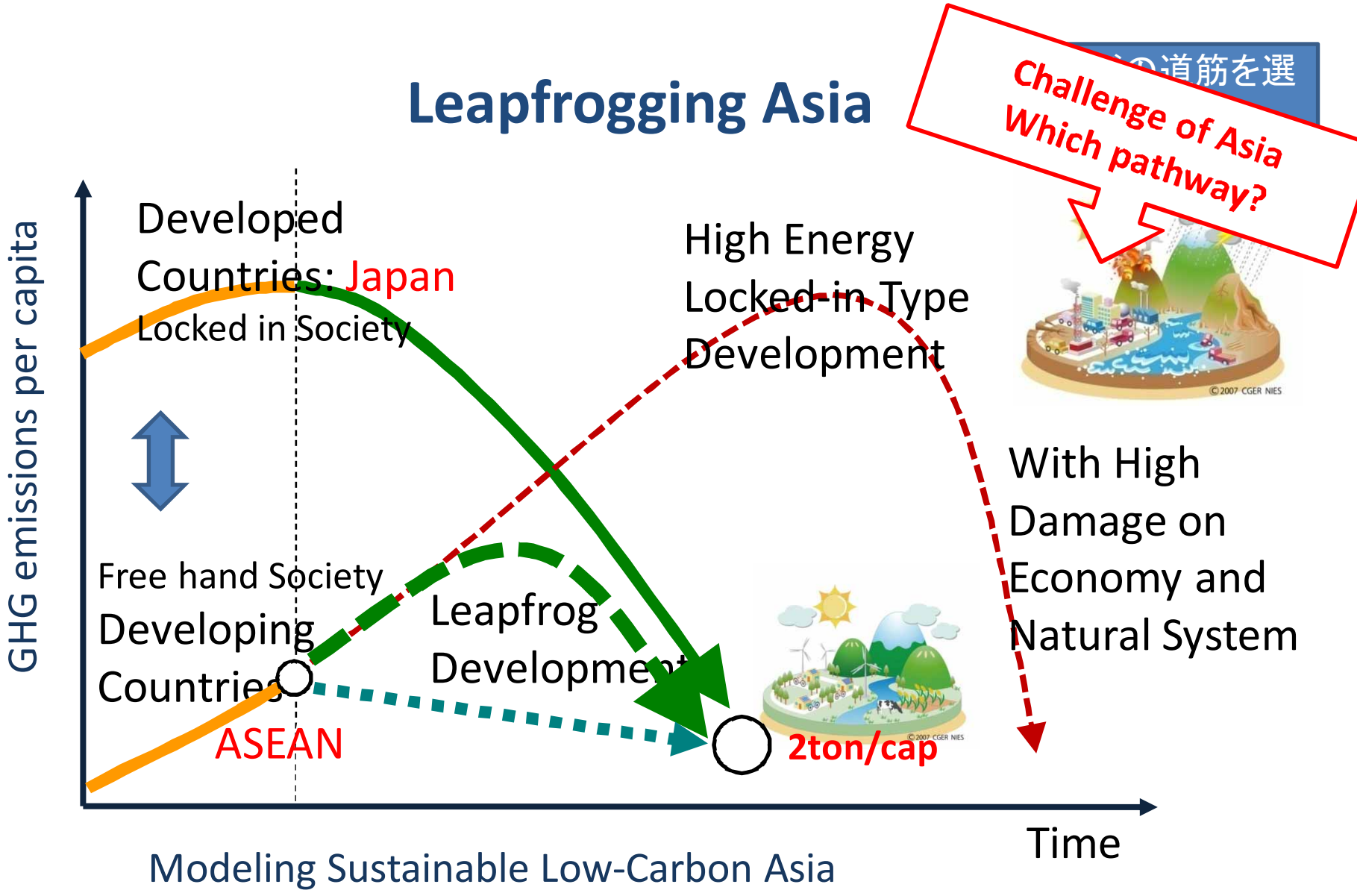
Japan: more than 80% reduction(base:1990)



2010/ 2012	Per Capita tCO_2
USA	17.4/16.1
China	5.88/6.71
Iran (2000: 2nd NC)	5.4
Bahrain (2000 2nd NC)	20
Thailand	3.38/3.65
France	5.28/4.94
Germany	9.12/9.04
UK	7.77/7.36
Japan	9.08/9.57

※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

Leapfrogging Asia

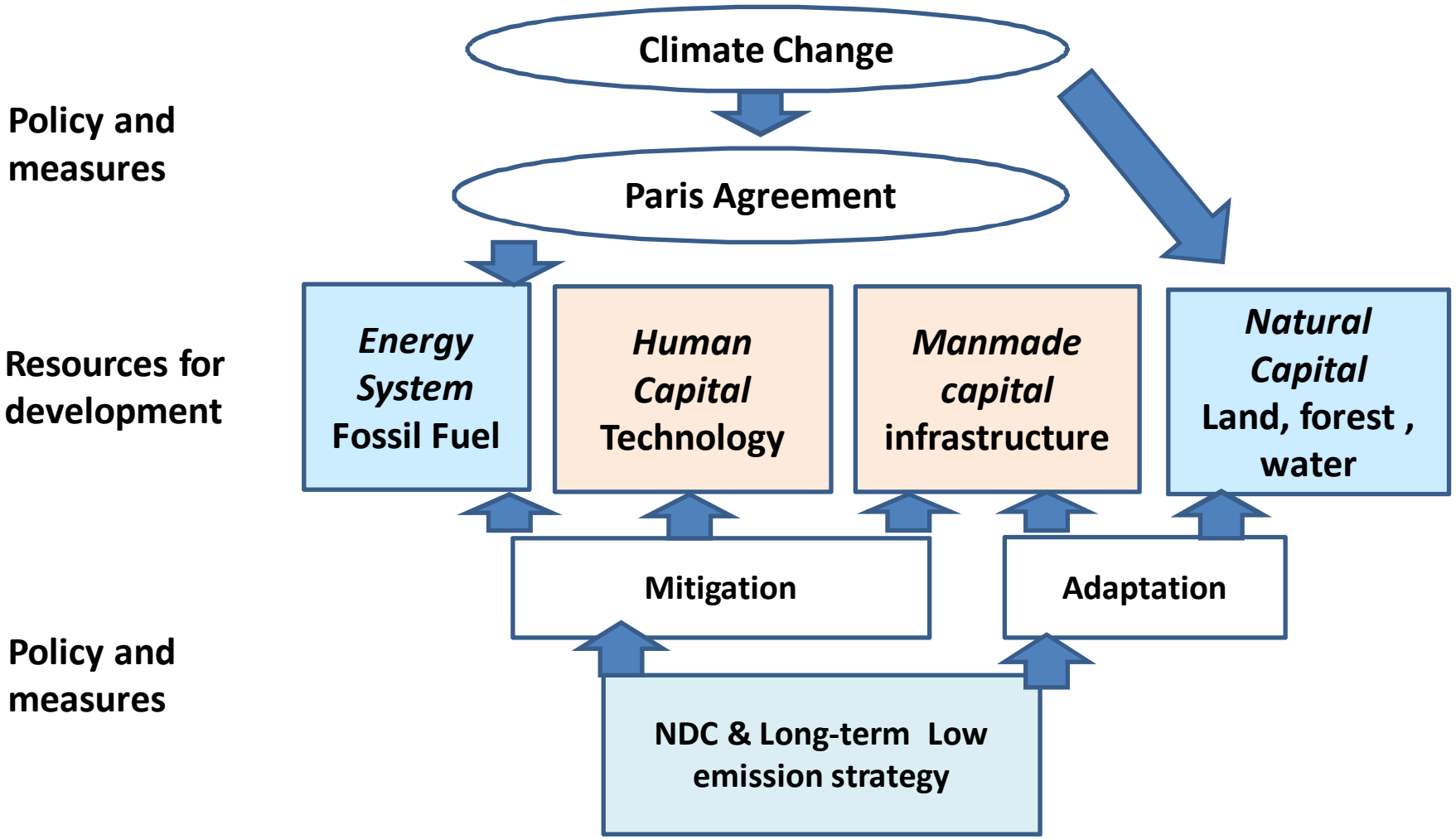


"Asian Low-Carbon Society Scenario Development Study" FY2009-2013, funded by Global Environmental Research Program, MOEJ

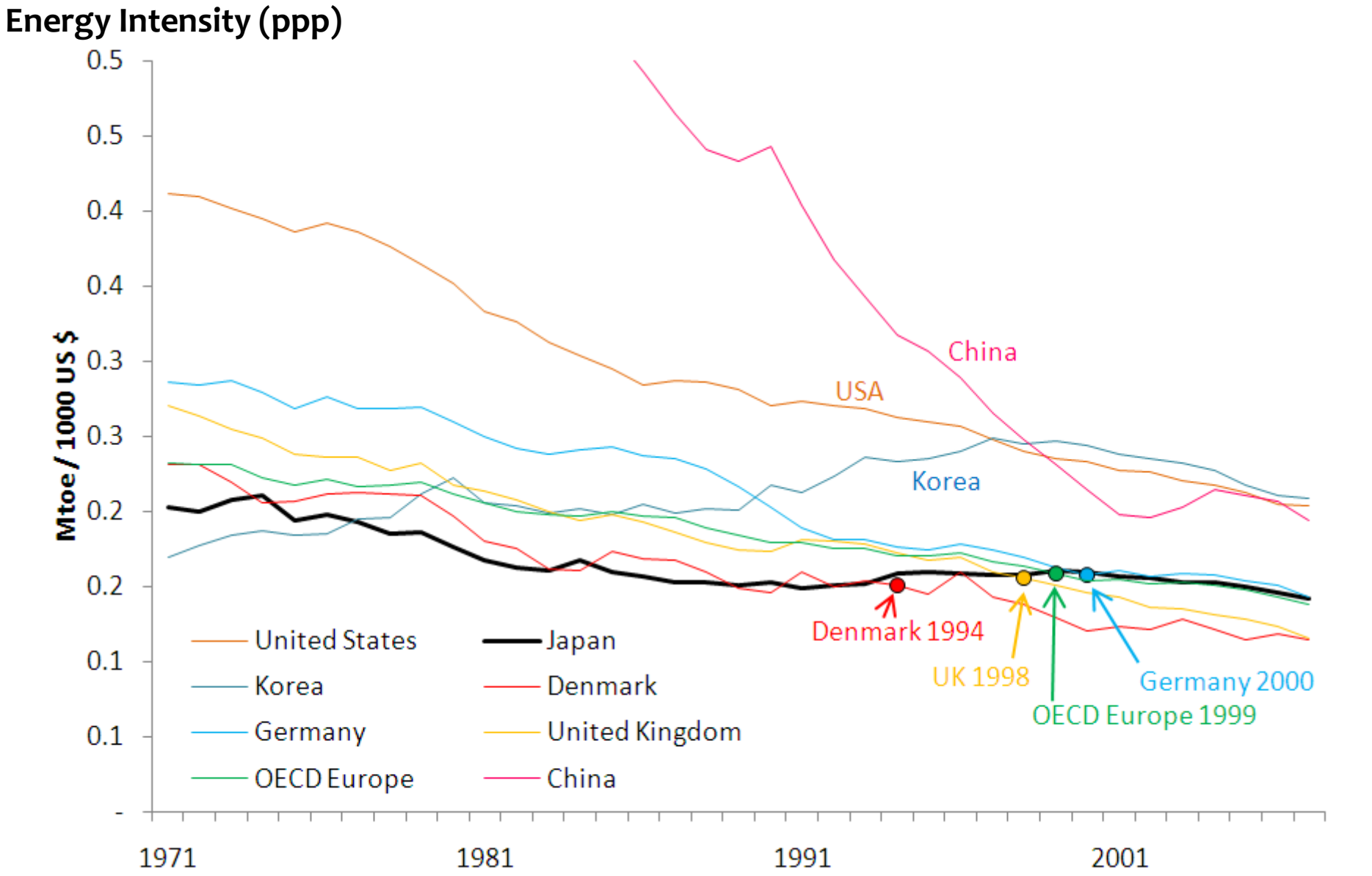
http://2050.nies.go.jp/index.html

Climate Change: Japan
Impact to Resources for Development

Discussed at 5th Annual Meeting

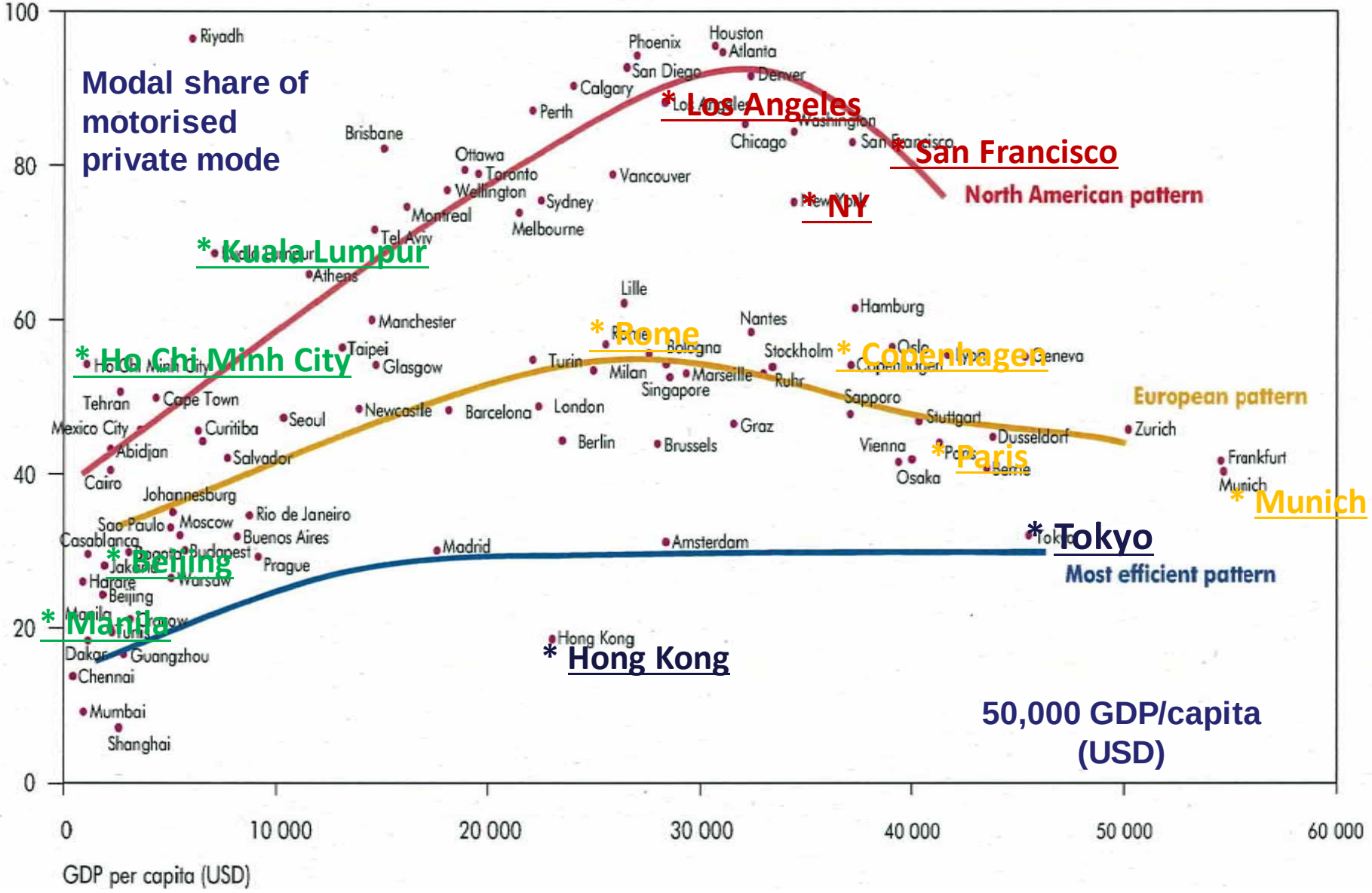


Japan delayed for low carbon technologies development and deployment?



Original Data: IEA (2009) CO_2 Emissions from Fuel Combustion - Highlights

Tokyo advantage: Least car dependent city
Metro network established before motor age came



Source: IEA (2008)

Mis-anticipated rapid shift to aged society

Result of car-based city dream

Before

and

After

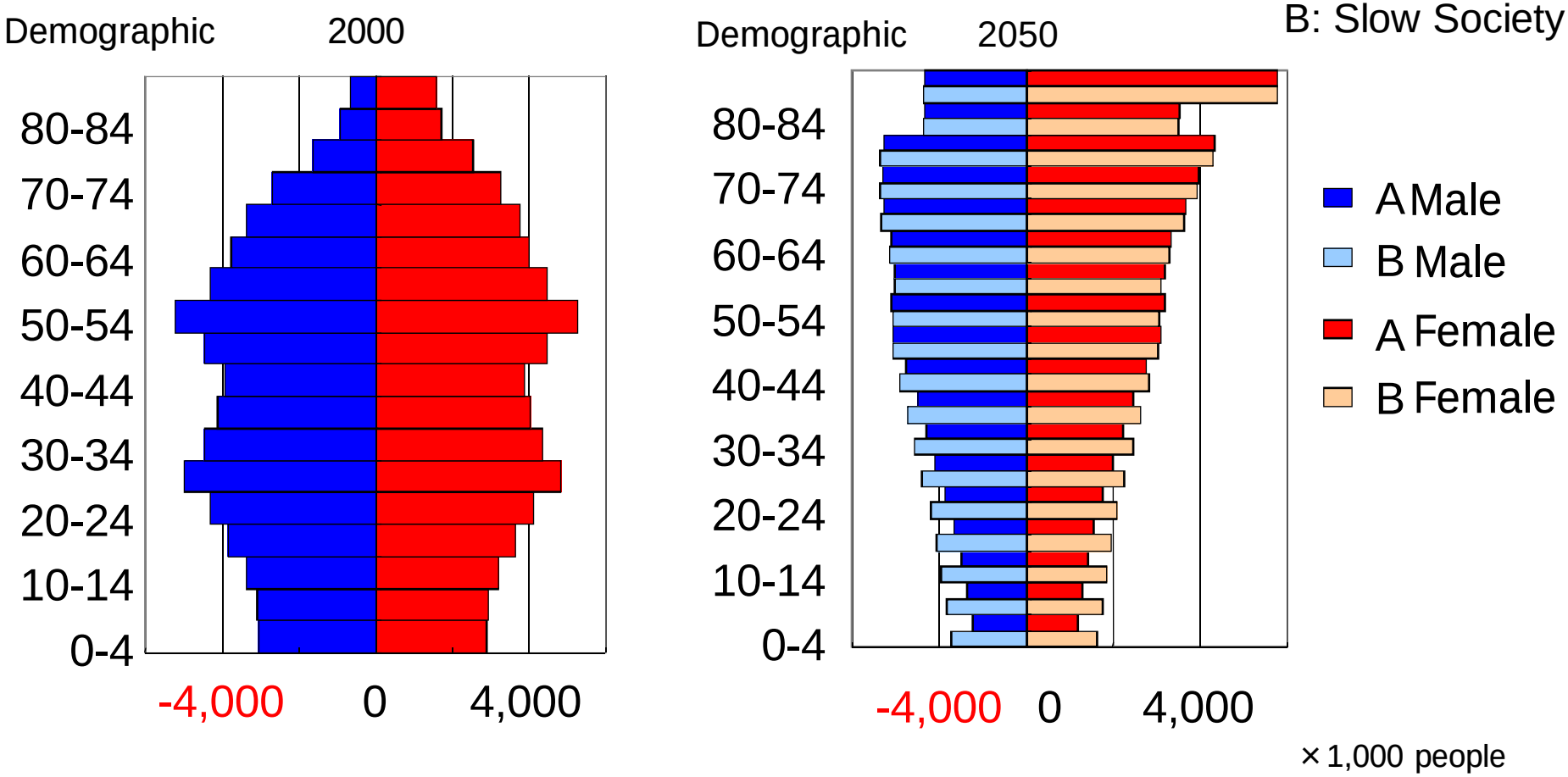
Future compact city

Source: Local Development WG team

Japan as the global front runner of aging societies

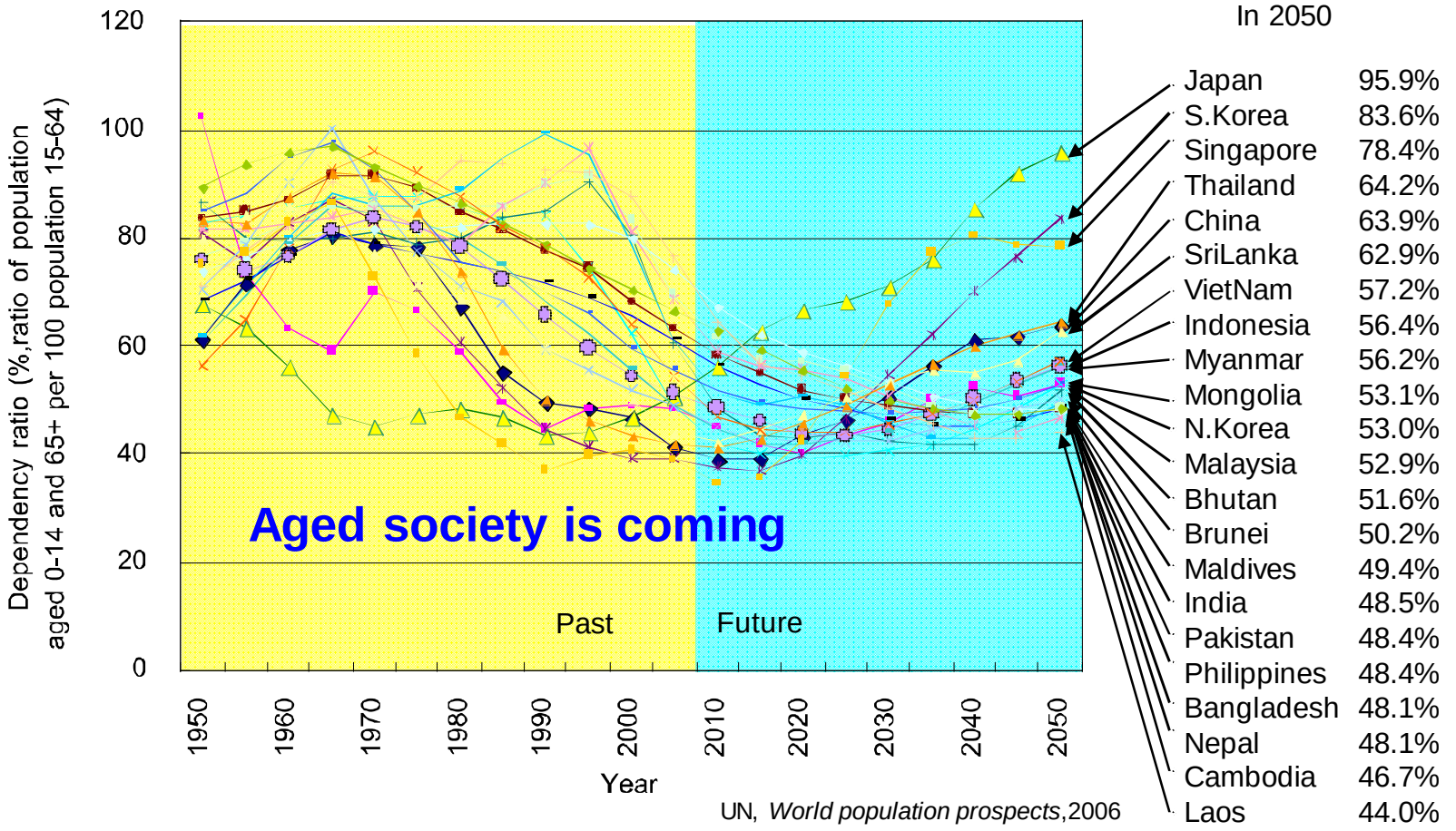
120 million ⇒ ＜100 million

Scenario
A: Vital Society
B: Slow Society



40 years after: Aged Asia

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

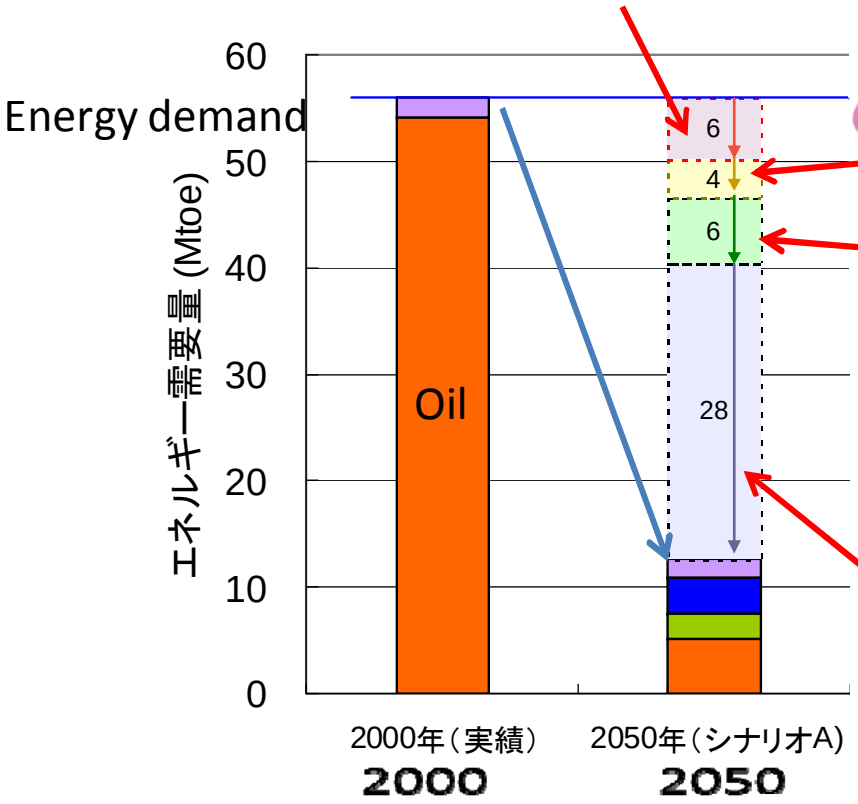


UN, *World population prospects*,2006

From Matsuoka, 2009

Deployment of technology 80% reduction measures in passenger sector

Population decrease/ aged society



Compact city
Reduction of mobility volume
Re-vitalization of city center, Pedestrian oriented car free green city

Modal shift
Public transportation as city backbone
Toyama city

Innovation
EV/FCV
New industry

Eliica 370km/h Shimizu

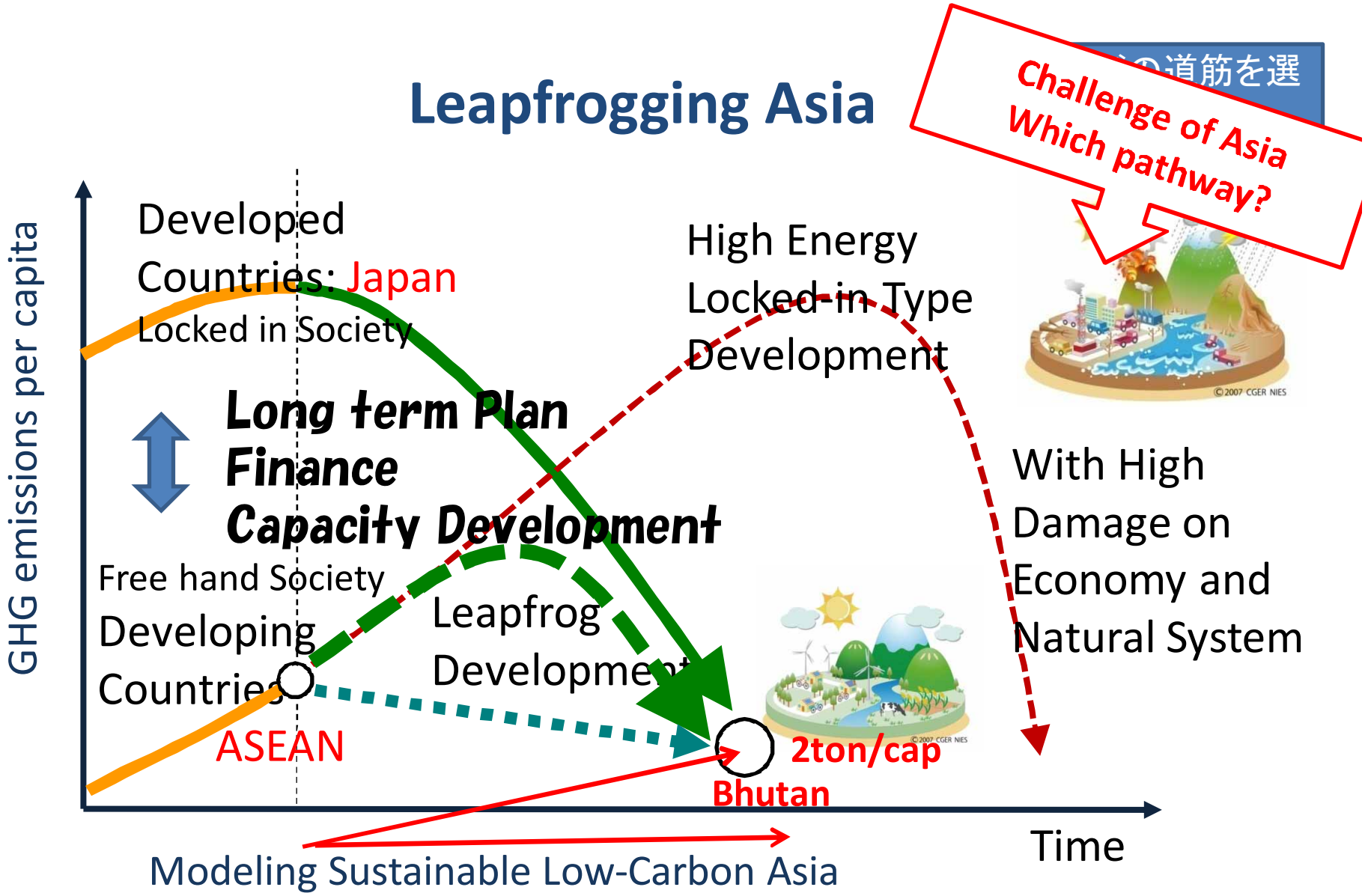
Different Pathways to Low Carbon Society

	Japan	Iran	Bhutan
Source of Revenue	Technology	Oil	Electricity to India
Emission/cap (ton) Absorption/cap (ton) Allowable emission	Now 2050 11 ⇒ 2 0 ⇒ 0 2	5.4 ⇒ 2 0 ⇒ 0 2	1 ⇒ 2 6 ⇒ 6 8
Obsoleting Asset	Highly energy depending tech. & infrastructure (locked in)	Almost stranding fossil fuel	
Advantageous Asset	Saving energy - technologies Human resource	Historical Asset Broad land	Hydro-power Forest, Biodiversity Good governance
Vulnerable Asset		Fossil fuel reserve Water shortage Drought	Water shortage Forest damage Landslide by CC
New development path	R&D industry Sharing Society	?	Fully natural resource dependent society

Dependency of resources /capital (Subjective Judgement by SN)

Resource	Fossil Fuel	NG	Hydro power	Forest	Land/ Sea	Hi-Ene Infra	Financial Capital	Human Capital
Value Trend	−−−	−	++ −	++ −	++	−−−	+ −	+++
Bhutan			OO	OO				O
Iran	OOO				OO			O
Bahrain	O					OO	OO	O
Indonesia	OO	O	O+ Geo	OOO	OO	O		O
Thailand				O	O	O		O
Malaysia	O			O	O	O	O	O
Vietnam	OO			O	O			O
China	OOO	O	O	O	O	OO	OO	OO
Japan						OOO	O	OO

Leapfrogging Asia



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

http://2050.nies.go.jp/index.html

Conclusion

- Climate change and its responding policy affect strongly to the resources of development so far worked in each country
- Each country has to reconsider its development pathway stipulated by climate change and responding policy
- To explore the new development pathway under different situations, country owed capacity building and formulation of knowledge community are indispensable, as this transition decides each country's long future

Thank you very much for your attention!

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

c/o Institute for Global Environmental Strategies (IGES)
2108-11 Kamiyamaguchi, Hayama, Kanagawa 240-0115, Japan

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