

8 February 2010

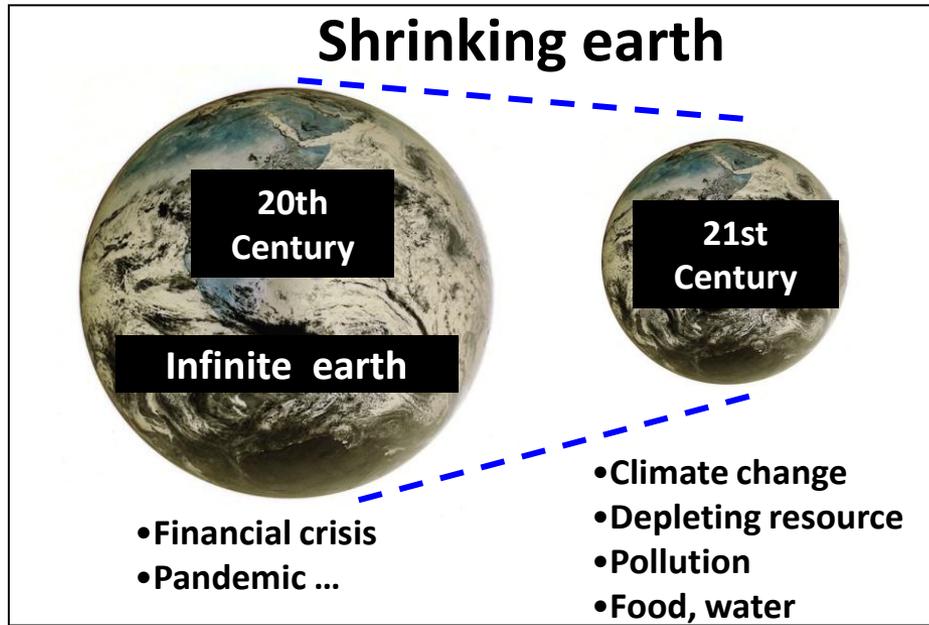
Japan-US collaboration for sustainability of humankind

Hiroshi Komiyama

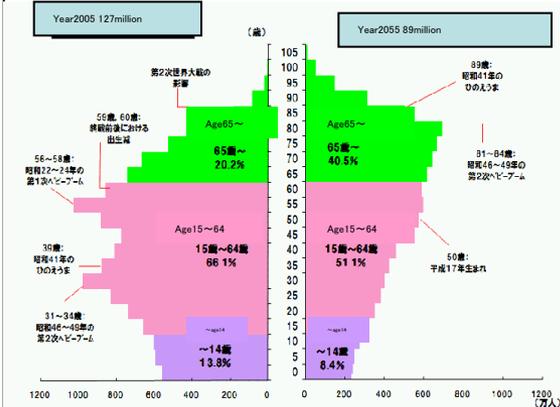
**Chairman of the Institute,
Mitsubishi Research Institute, Inc., Japan**

President emeritus, University of Tokyo

Paradigm in 21st century



Aging society



- Longevity
- Small birth rate
- Saturating demand
- Pension
- Medicine
- Care
- Work sharing
- Barrier free ...

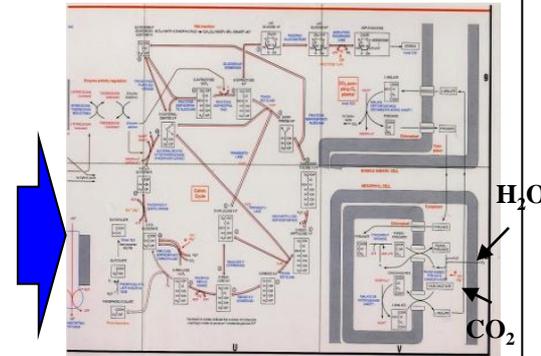
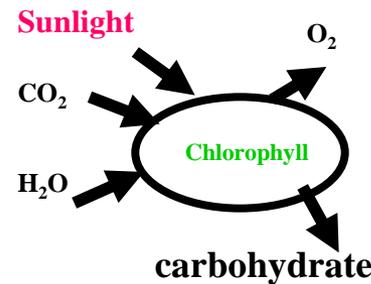
平成17(2005)年は総務省統計局「国勢調査報告」

National census 2005, Ministry of Internal Affairs and Communications

Exploding knowledge

1900

2000



Source: Japan as a forerunner for addressing emerging problems in the world P134

2050 will come soon.

We are running out of time.

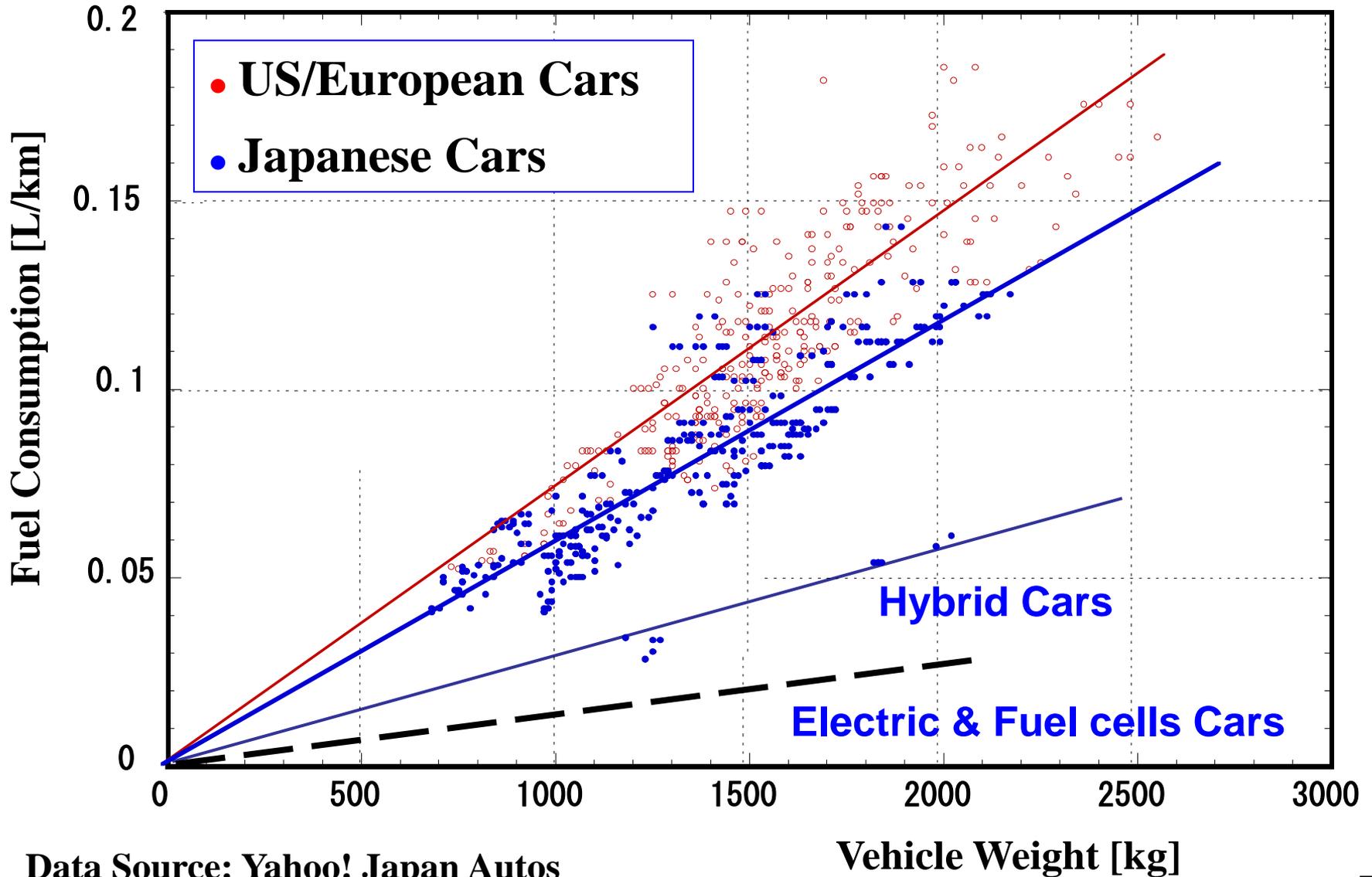
**We need a concurrent approach
to accelerate the process.**

Structuring of actions is the key.

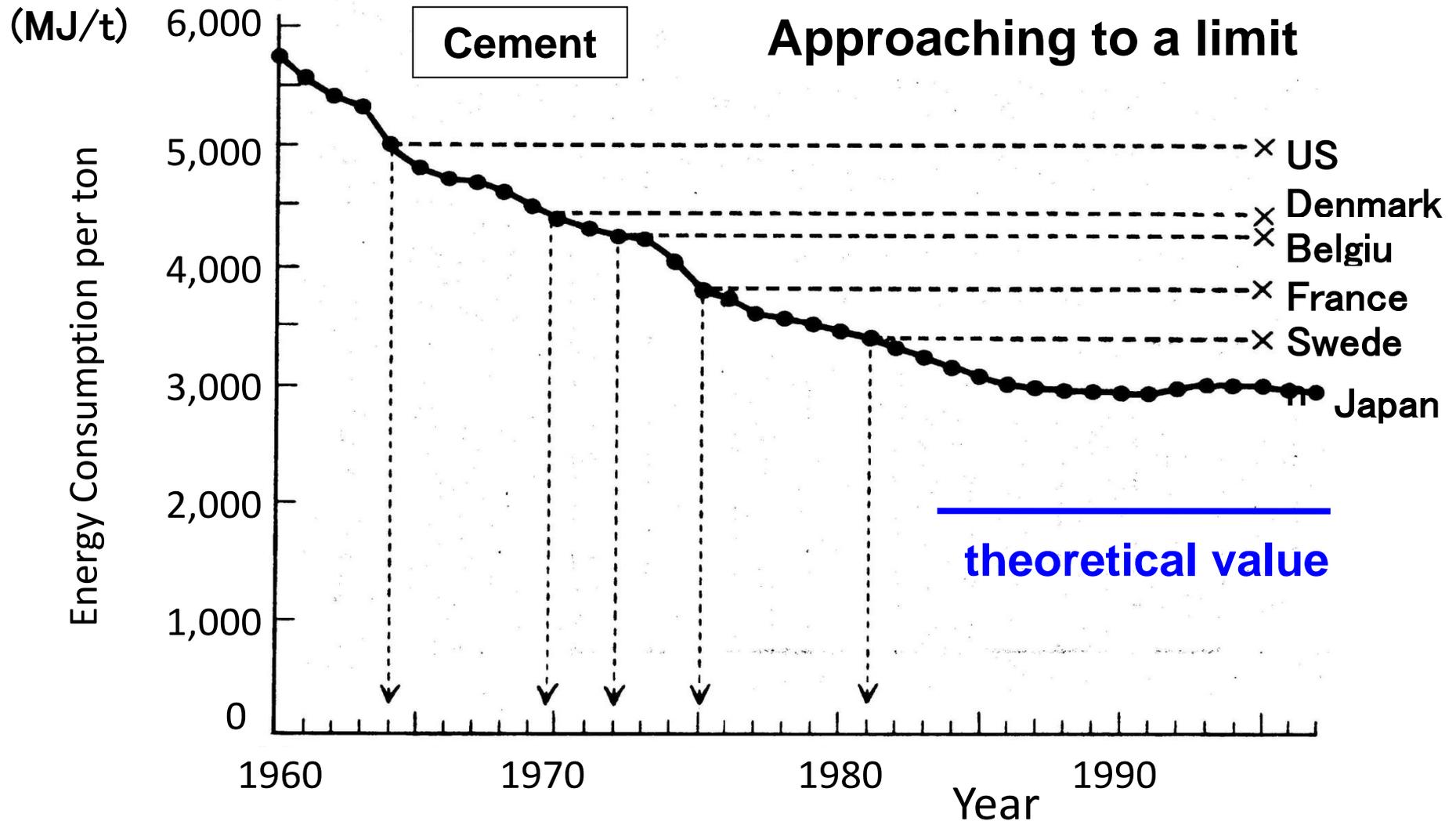
Vision 2050

- **Improve energy efficiency by three times**
- **Double the use of renewable energy**
- **Establish recycling system of materials**

Automobile energy consumption to 1/10

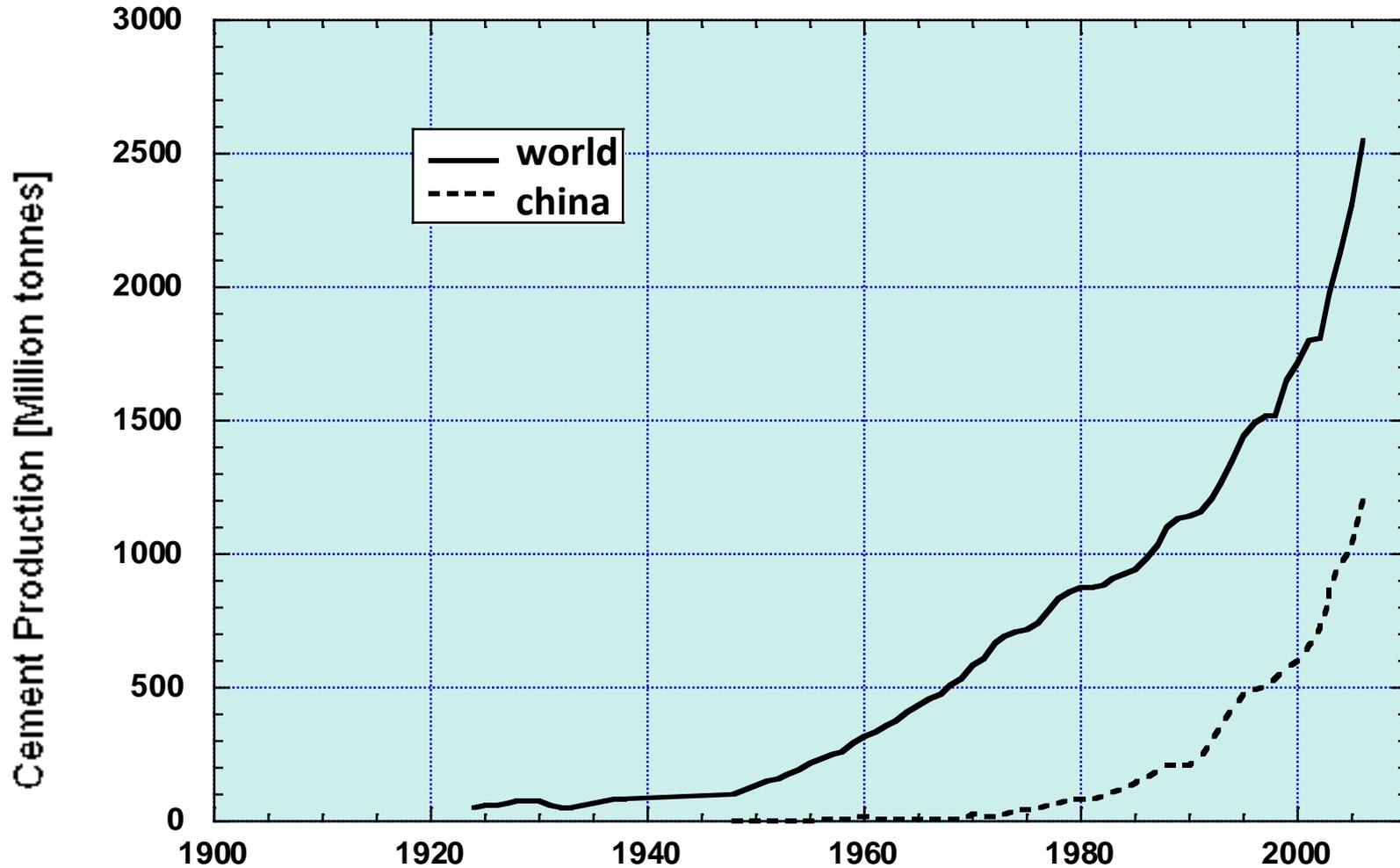


Technology transfer can reduce emission



In summary, energy efficiency improvement by 3 times is feasible

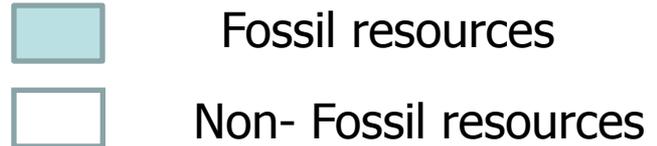
Annual rate of cement production in the world and china



Investment for energy efficiency is win-win-win

Energy Scenario and CO₂

a) 1990



b) 2050 BAU case



c) Vision 2050

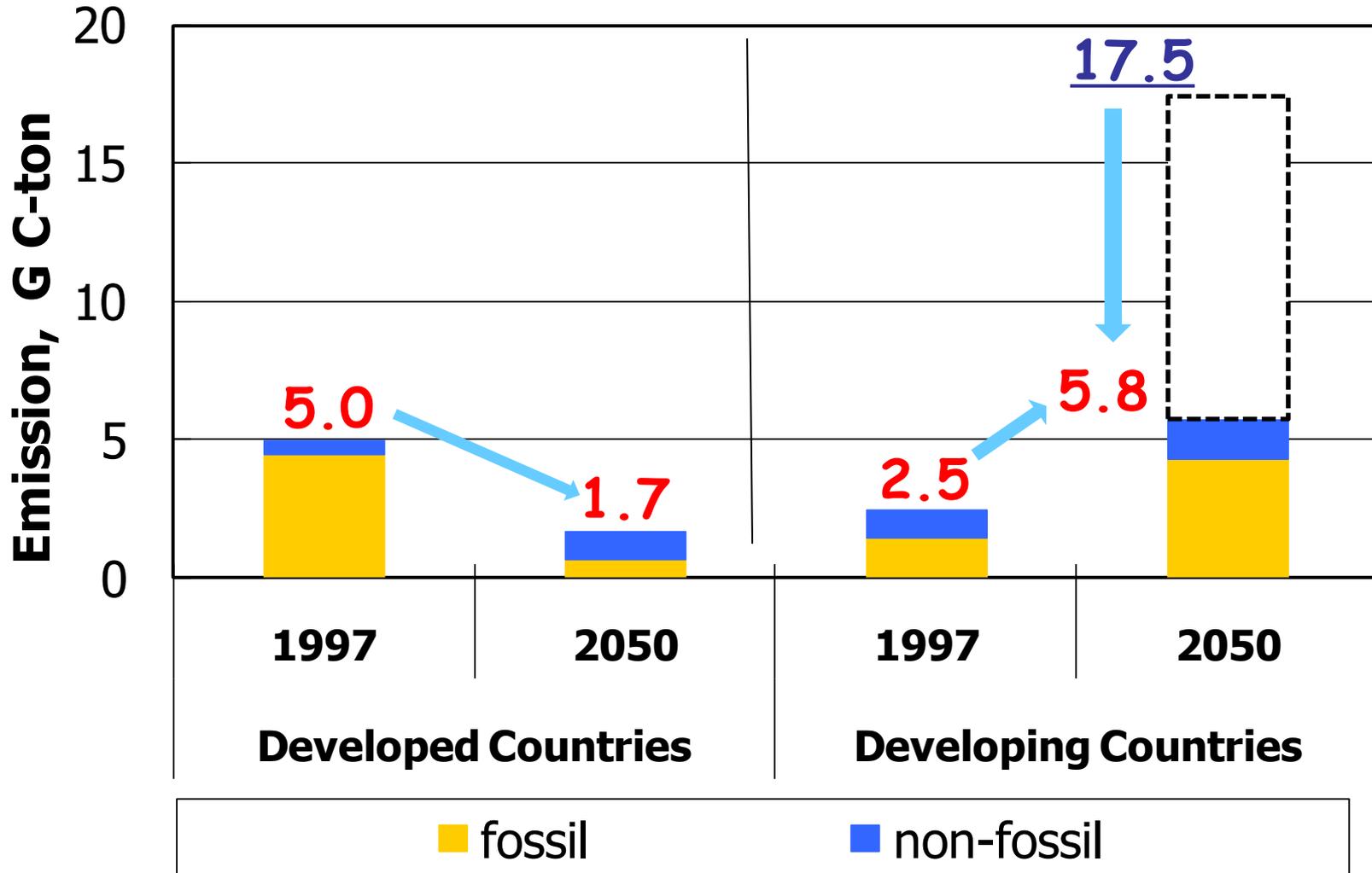


d) Target after 22nd Century

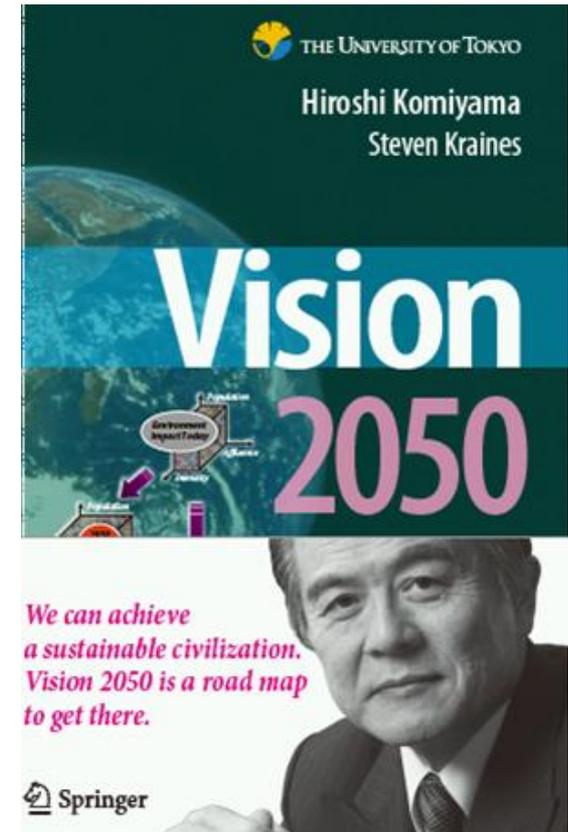
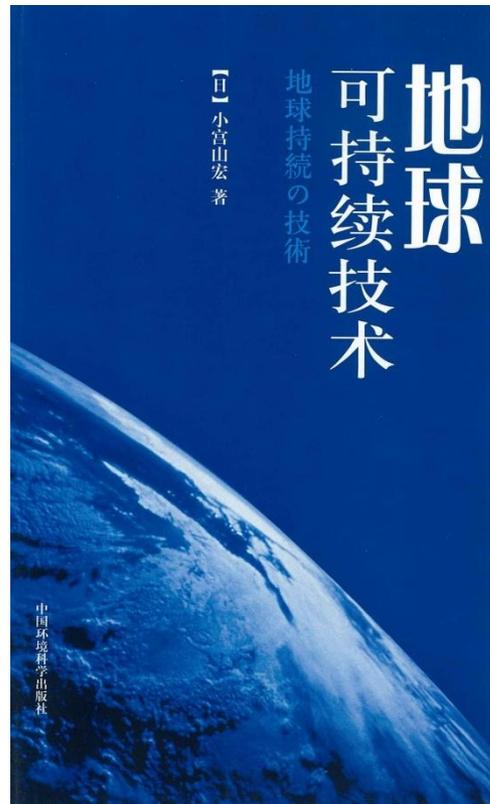
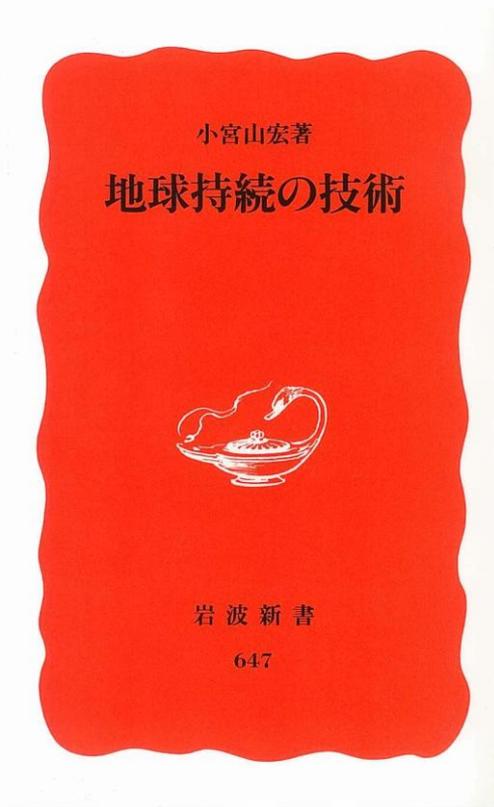


Data: from "Vision 2050"

Energy Scenario in developed and developing countries



Technology for the Earth - Vision 2050 -



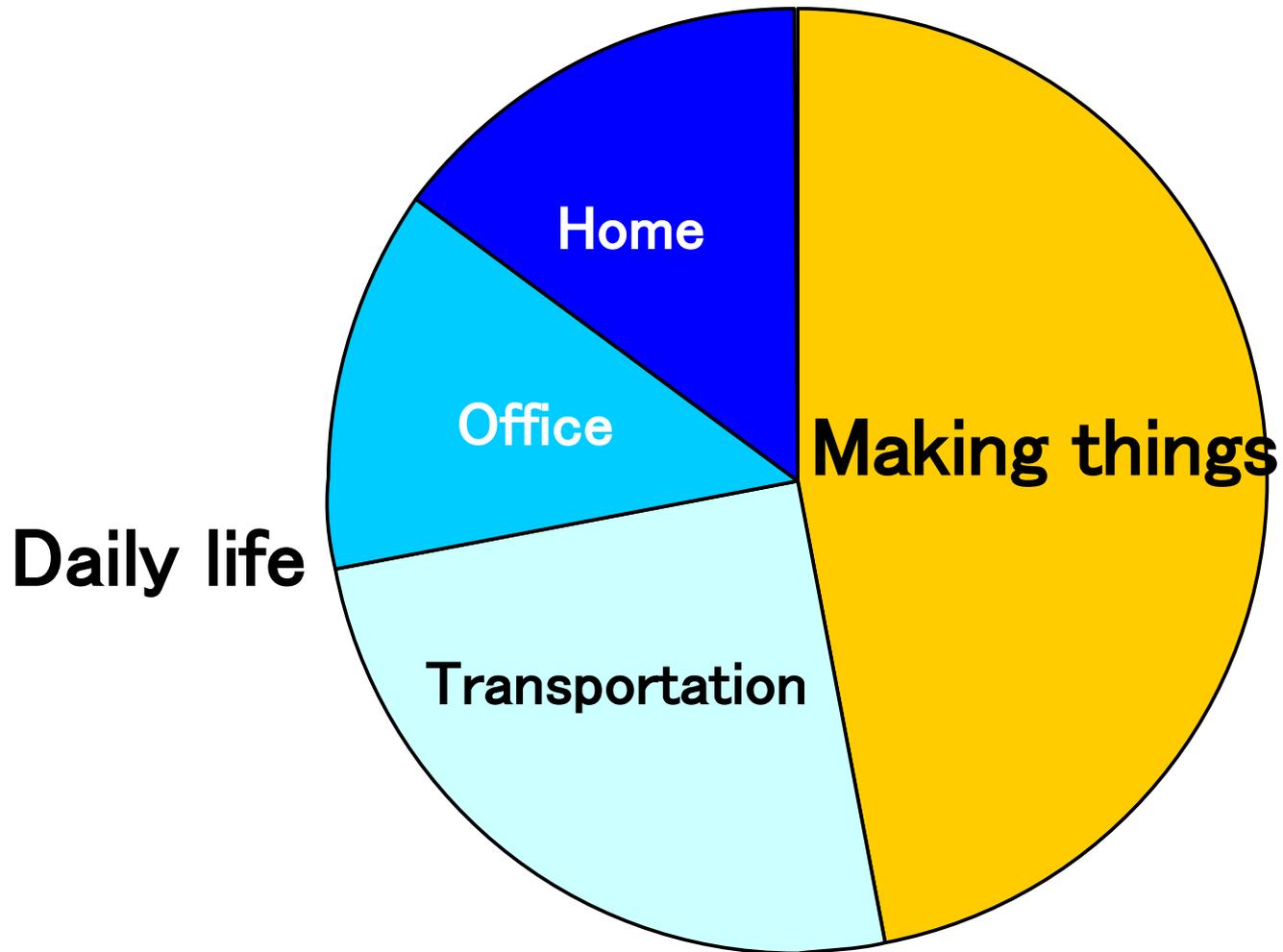
Publishing is not enough

Challenge25 Campaign

—Komiyama's proposal—

Daily life	12%
Making things	3%
Nuclear energy etc.	5%
Forest etc.	5%
CDM	5%

Energy consumption by final use



Cooling and heating energy can be 1/10

Heat insulation of houses and buildings

bonfire	wretched hut	temple	house	eco-house	ideal
0	1	5	30	100	∞

Air conditioner

before 1990	1997	2004	2006	VISION 2050	theory
3	4	5	6	12	43

Water Heater

US (majority)

Tank storage 40%

5

Heat-pump (ecocute)

$50\% \times 4 = 200\%$

1

Japan (majority)

Heat-to-use 80%

2.5

Fuel cell (enefarm)

36% elec. + 50% hot water

0

Actions of Individuals

Komiyama Eco-House



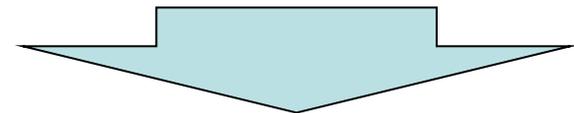
Hybrid car: 22km/l

Heat Pump Water Heater: COP=4

High Insulation: $K=1.6 \text{ W/m}^2\text{K}$

New air conditioners

Solar Power Generation: 3.6kW



80 % Energy Reduction

Action Plans of Nations

- **EU: Has committed to reduce 80% of emissions by 2050**
- **Japan: Former Prime Minister Fukuda announced a vision for reducing 60- 80% of emissions by 2050**
- **US: President Obama has announced a plan to reduce greenhouse gas emissions 80% by 2050.**



Action Plans of Municipalities

- **California: 80% Reduction of GHG's by 2050**

Schwarzenegger



- **Tokyo: 10-Year Project for a Carbon-Minus Tokyo**

Ishihara



- **London: The London Low Emission Zone (LEZ)**

Johnson

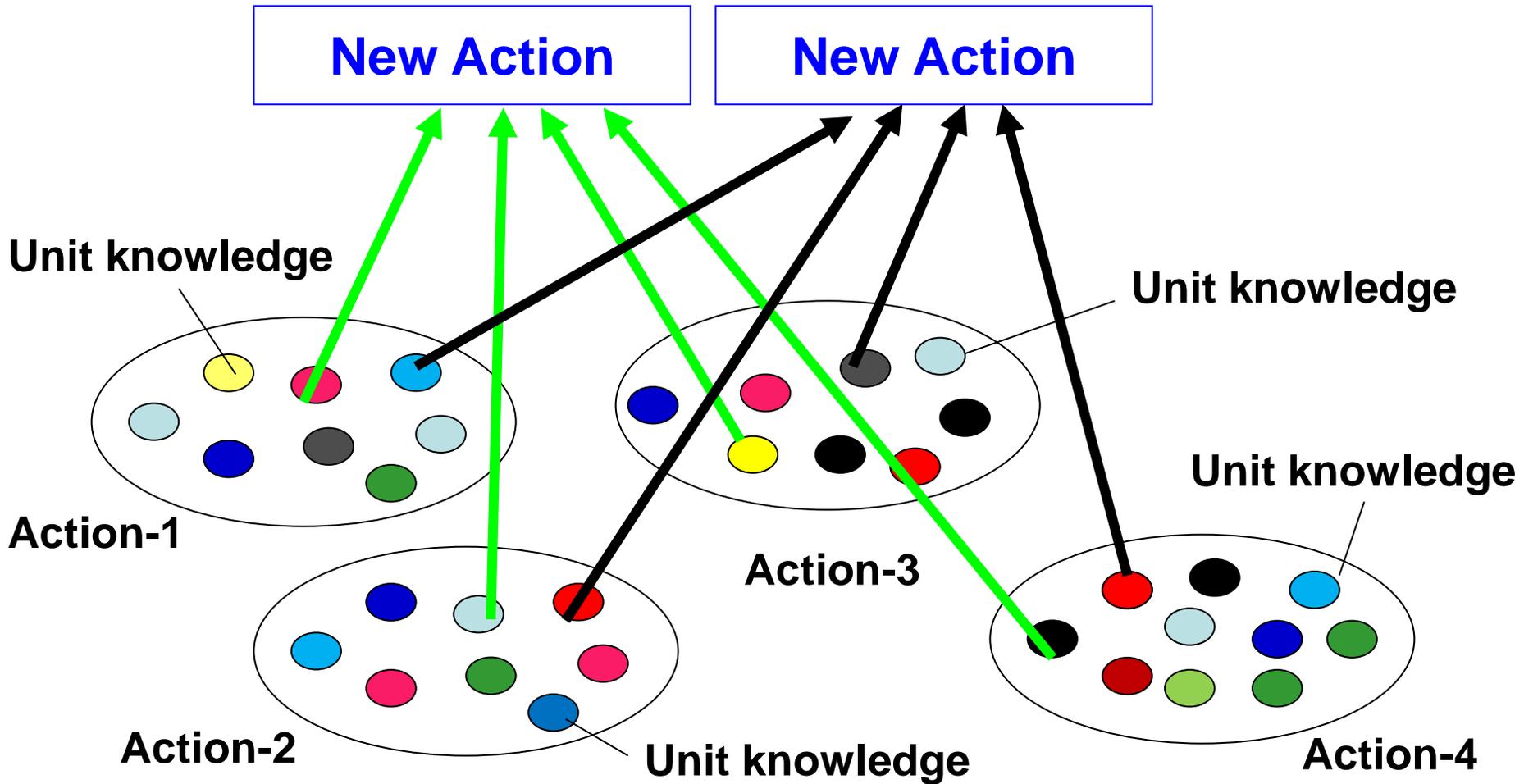


**2050 will come soon and so
we don't have much time any more.**

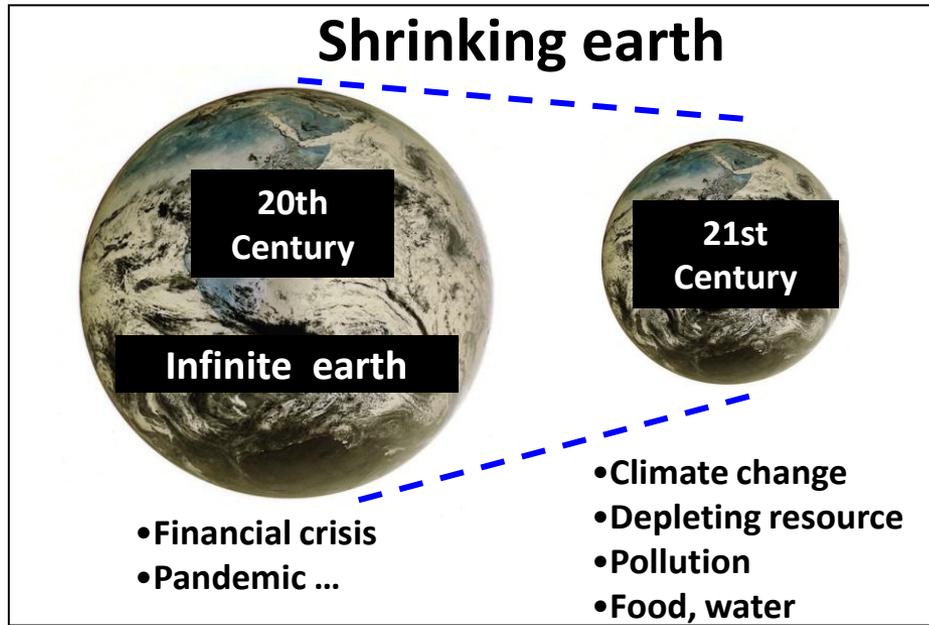
6 billion people must take actions.

**We need structuring of actions
to shorten the lead time.**

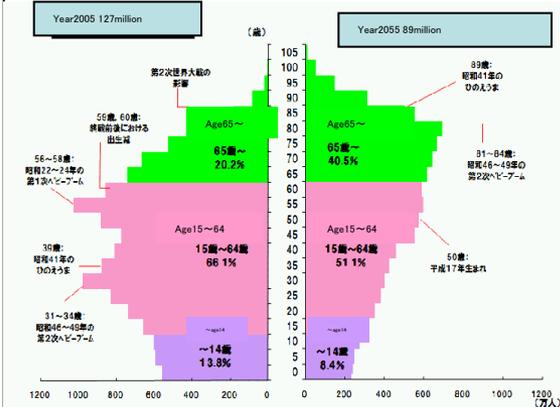
Concurrent Approach by Structuring of Actions



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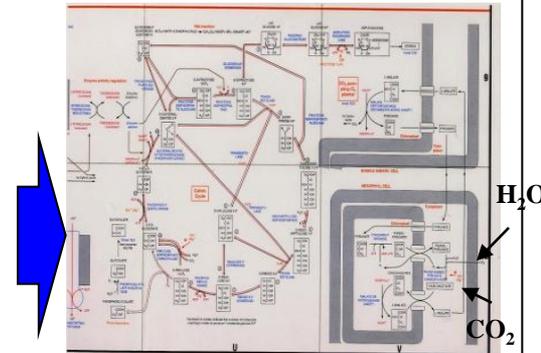
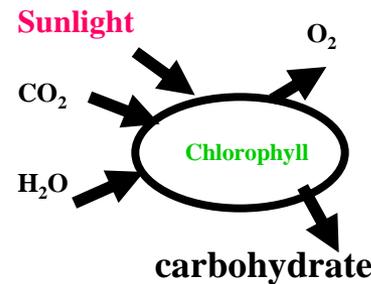
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Green & silver & golden growth

Shrinking earth

Eco house
Eco appliance
Eco car
Solar panel
Wind mill

Aging society

Barrier free building
Health monitoring
Safe mobility
Senses supporting

Exploding knowledge

Structuring knowledge
Structured knowledge- base
Education
Lifelong learning
Value creation

Urban type

LED light, Use of natural light

Photovoltaic power generation

High-efficient air conditioning systems

Heat pump, high-efficient heat sources, fuel cell, etc

Heat island measures

Light rail transit

Heat accommodation

High densification of energy demand by advanced land use

Compact city

Innovation to low carbonising

Renewable energy · Supply resources type

Wind power

BTL (Biomass to Liquid)

Mega solar

Platinum Network

The achievement of comfortable residential environment
The measure to the aging society

The creation of advanced model by harmonizing policy, technology, and business

The creation of new industries

Heat accommodation, from heat sources (incineration plant, etc) to housing group

Vegetable plant by elderly employment

High insulation in the house

High-efficient water-heaters

Photovoltaic power generation

Electric Vehicle

Suburban type

The creation of residential environment, saving energy and comfortable

Biogas by utilization of livestock waste

Heat supply

Green house

Photovoltaic power generation at follow land and stall

Production of resource crops at follow land

Production of biofuels

Production of biomaterials

Rural type

Platinum Network (Eco, Barrier-free, High-quality of life)

Eco-Model Cities with Action Plans:
Kita Kyushu City, Kyoto City, Sakai City, Yokohama City, Iida City,
Obihiro City, Toyama City, Toyota City, Simokawa City,
Minamata City, Miyako City, Yusuhara-machi, Chiyoda-ku

Independent Government Bond
(Refundable)

Platinum Fund

Prefectural Fund

Toyama: Compact City
Studying

Fukui : Fruitful-Aged Society Agreement:
With Institute of Gerontology, The University of Tokyo

Kita Kyushu City:
Environmental capital ,
Asia low carbon center
(tentative) , President

Kumamoto:
Under
Negotiation

Proposal by MRI: Platinum Society

Ibaraki:
「Eco ,Agriculture and
Forestry」
Under Negotiation

Nagano:
Studying

Nao-shima:
Eco Town:
Planning

Toyota City: Action Plan
Special Municipal
Committee at Komiyama'
Eco House, Oct 29



Hokkaido: Green Society: Studying
Honorable Advisor



Aomori : "Aomori Central Park
Low-Carbon Model Plan"
Kick off, Sep 29:Special Advisor

Kashiwa & Nagareyama
Cities:"Kashiwa Int'l Scientific City
Plan": Industry-Municipality-
Academic Collaboration 2005

Katori City: Studying

Yamatake City: Biomass Town
Under Negotiation

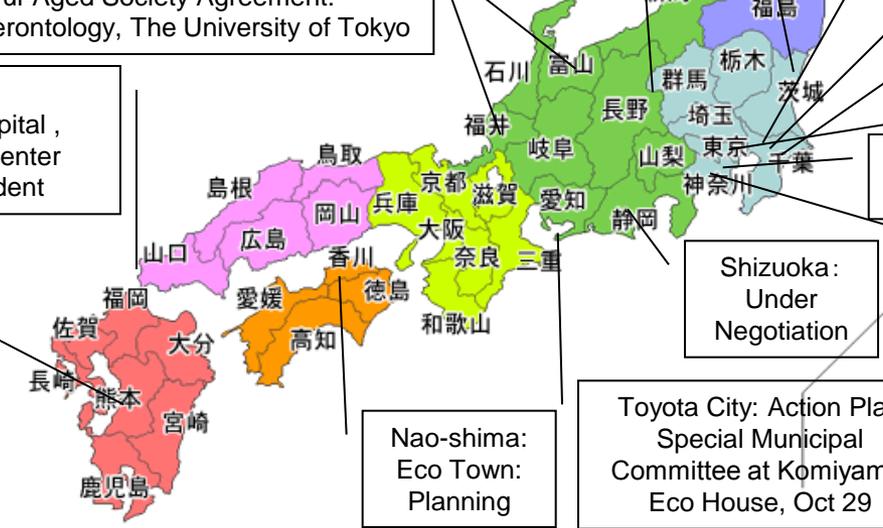
Tokyo: Rainbow Town: Studying

Kawasaki City:
Nanofabrication (4 Universities)

Yokohama City: Yokoyama
Eco School (YES):
Honorary adviser

Future Design Center (FDC):
Established to solve national issues, July 2009
Concluded agreement with Future Center, The
University of Tokyo

MEXT: Chair of Strategy Committee for Low carbon Society



Japan's experience with Sumida river

1967



present



東京屋形船案内

http://www.t-yakata.com/tyh_dkship.htm

環境省 図で見る環境白書 昭和57年

<http://www.env.go.jp/policy/hakusyo/zu/eav11/eav110000000000.html>

Japan's experience with Yokkaichi

1950's



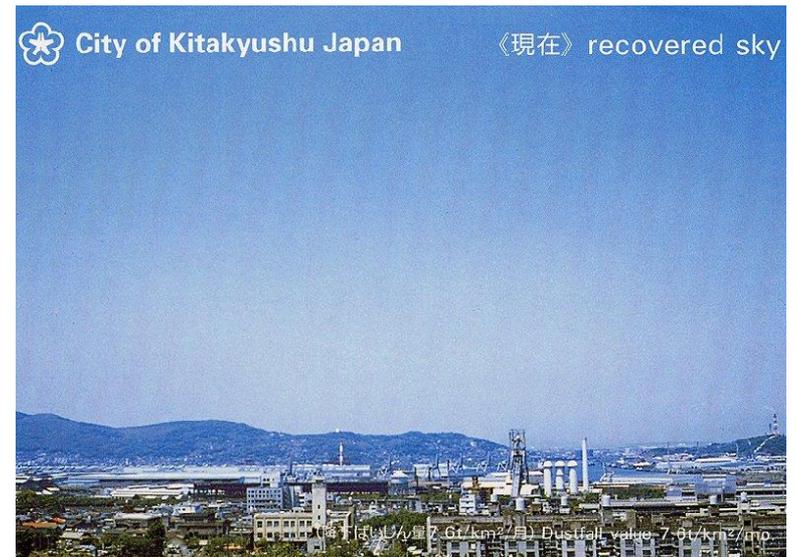
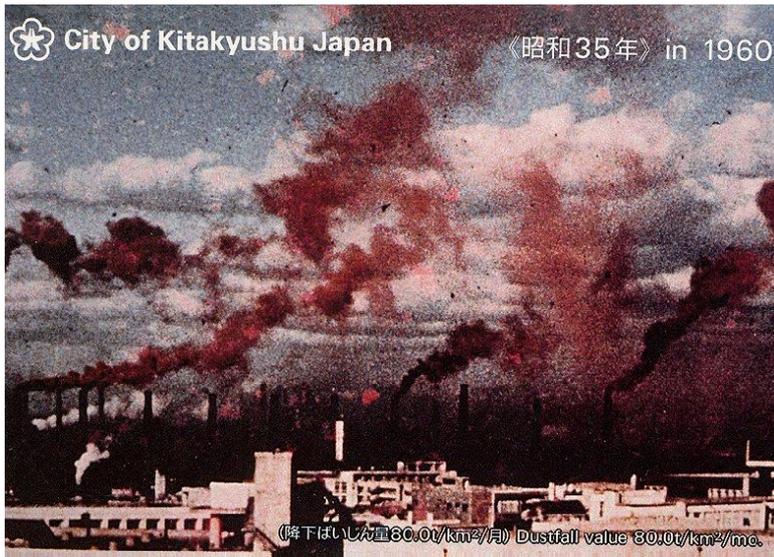
present



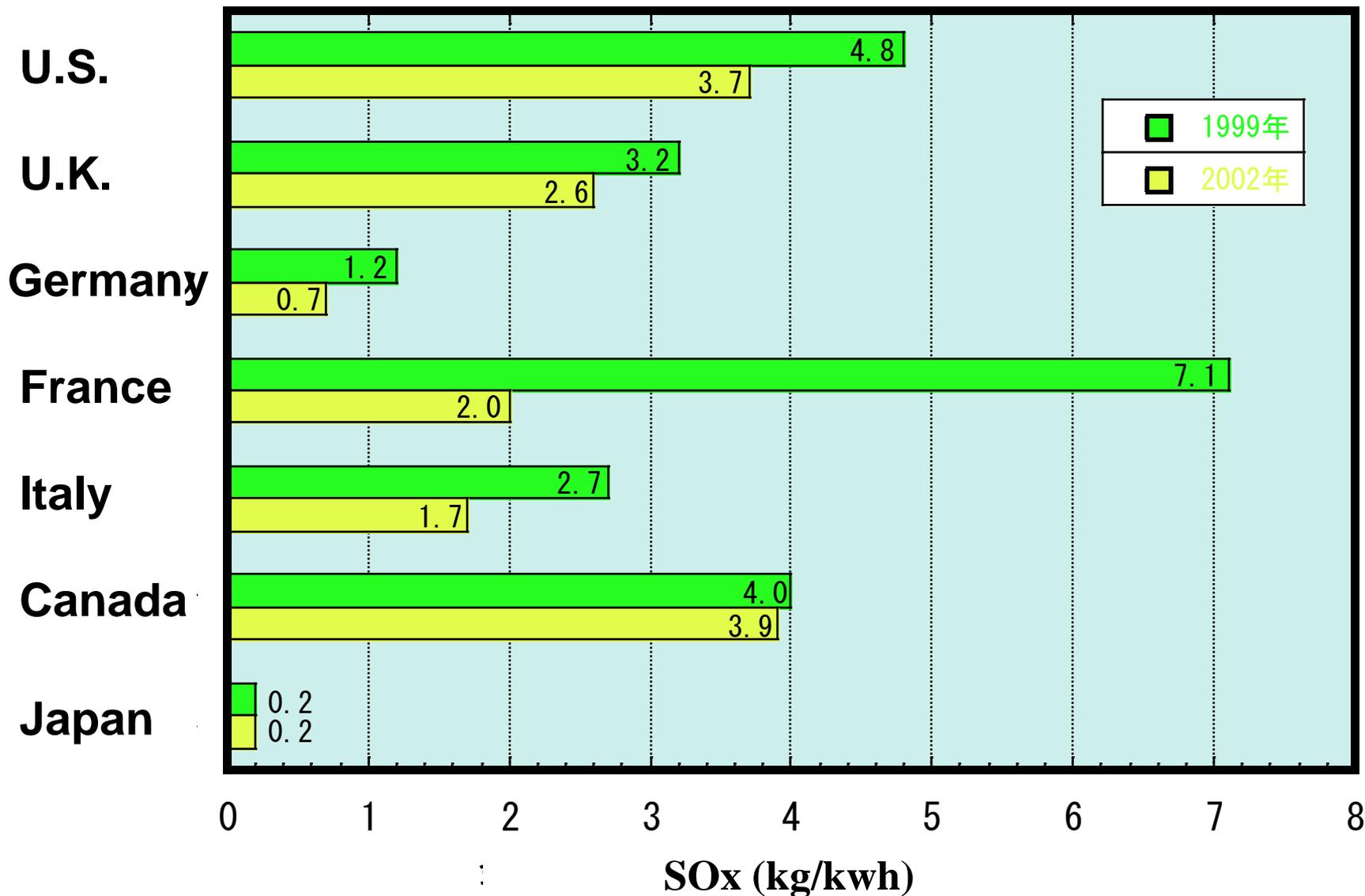
©Yokkaichi City

<http://www.city.yokkaichi.mie.jp/kankyo/kogai.htm>

Japan's experience with kitakyusyu



Emission of Sulfur Oxides from Thermal Power Plants



We don't have much time any more!

Actions and Structuring of them

World strongest nation

×

World most efficient nation

Thank you !