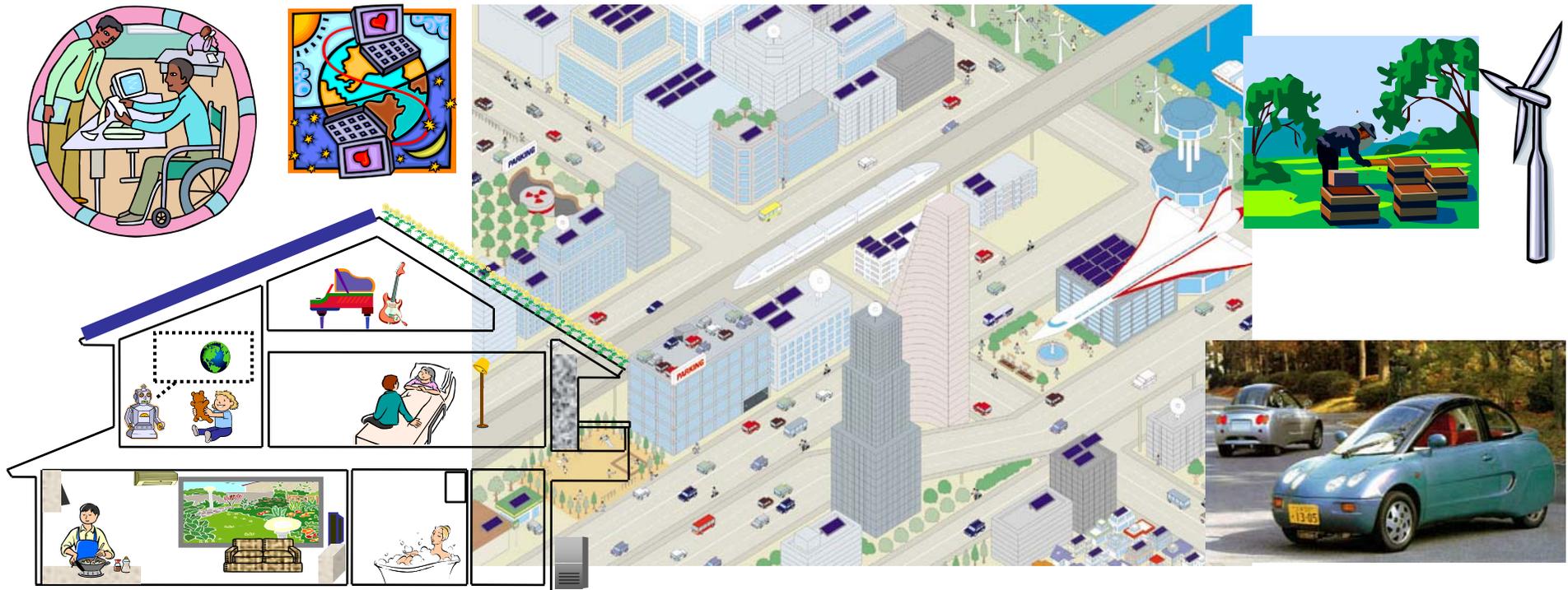
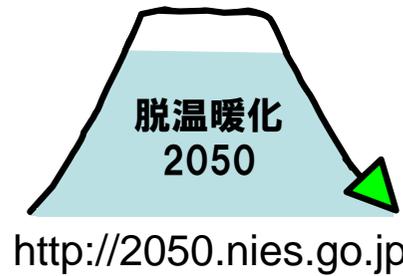


Policy Implementation - How to develop LCS study -



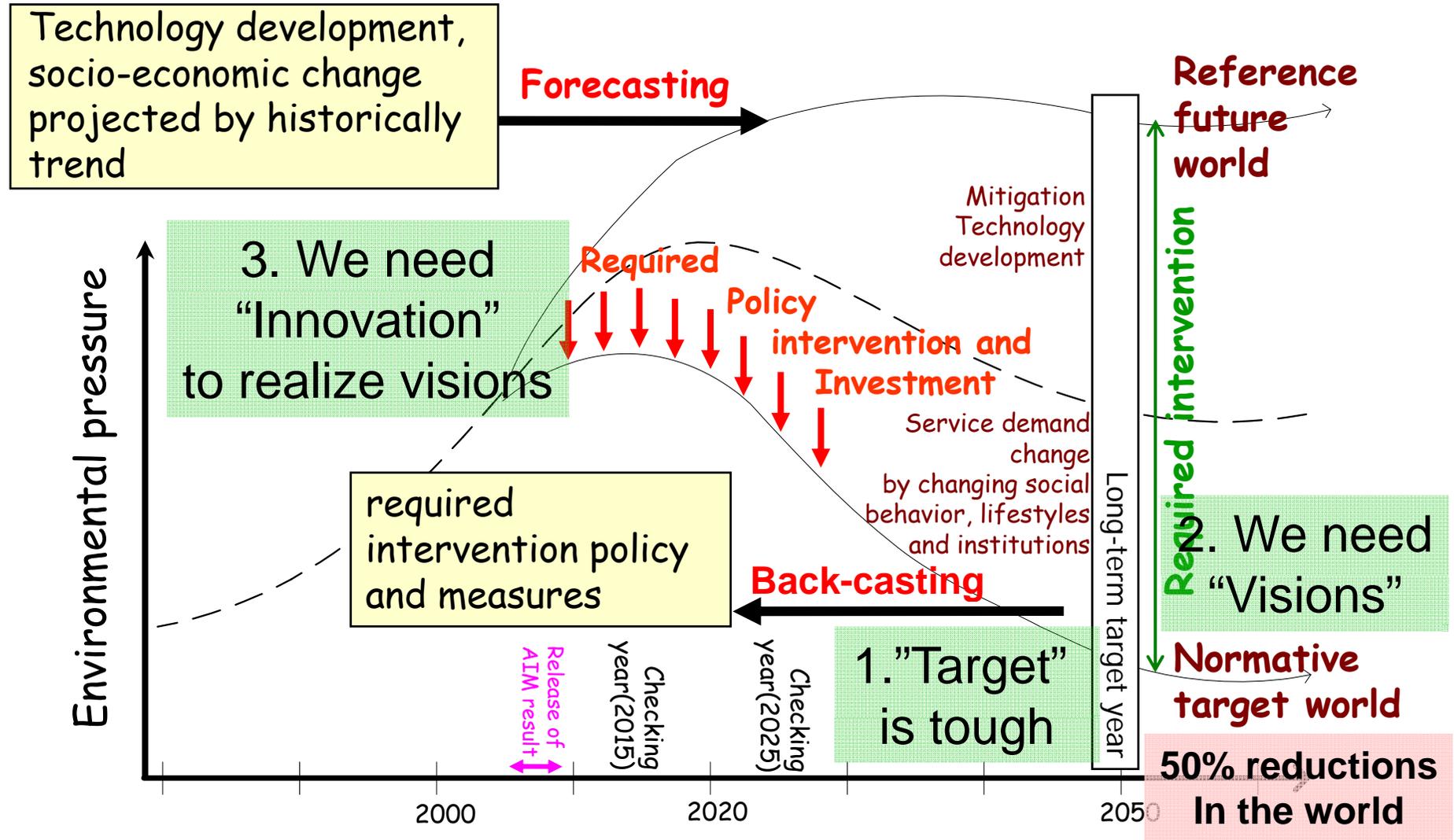
Junichi Fujino (fuji@nies.go.jp) NIES

2008 AIM Training Workshop, Tsukuba
28 Oct, 2008

What LCS model can offer?

What LCS model should answer?

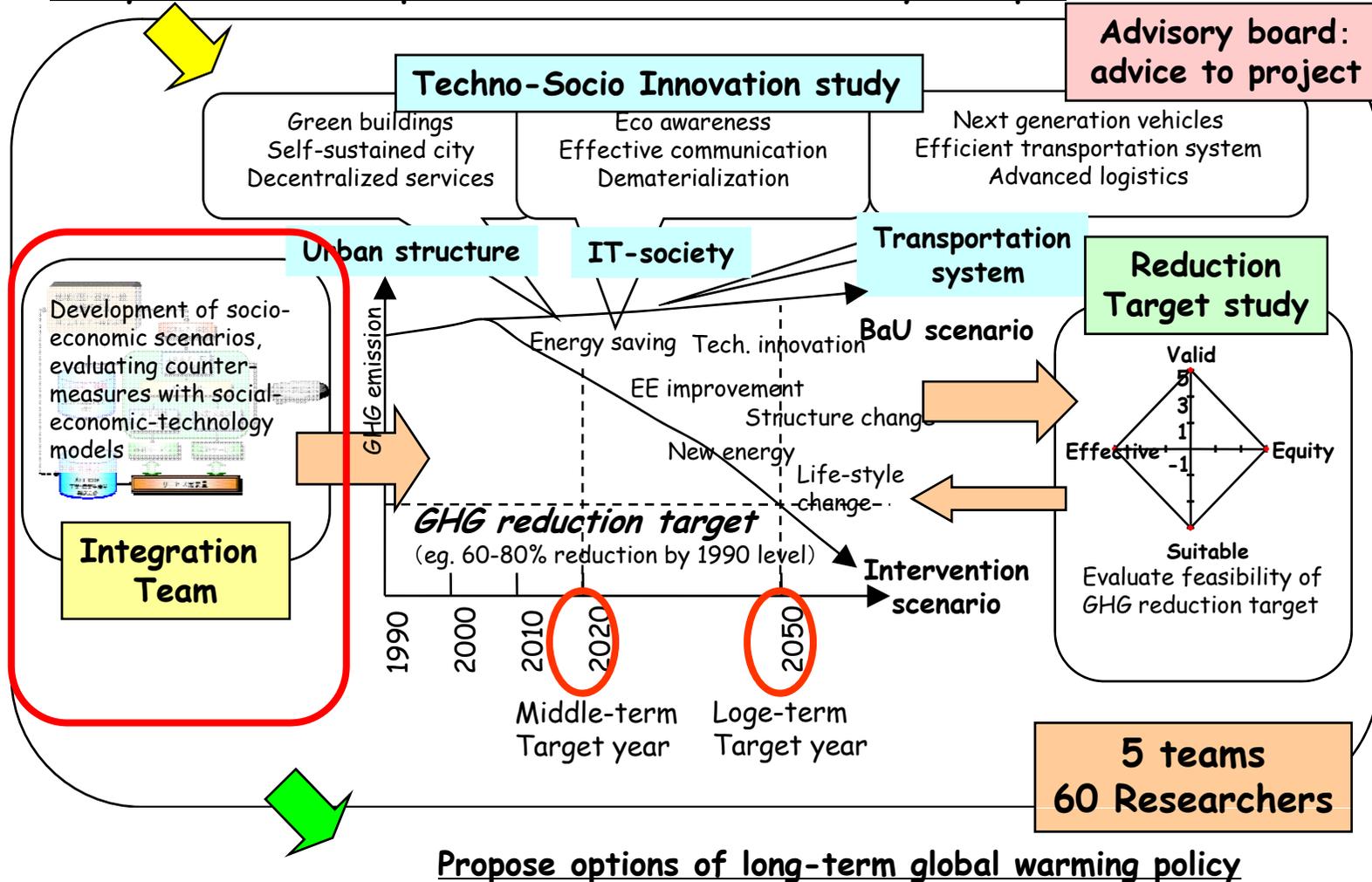
Forecasting from now and Backcasting from future prescribed/normative world



Japan Low Carbon Society Scenarios toward 2050

[FY2004-2008, Global Environmental Research Program, MOE]

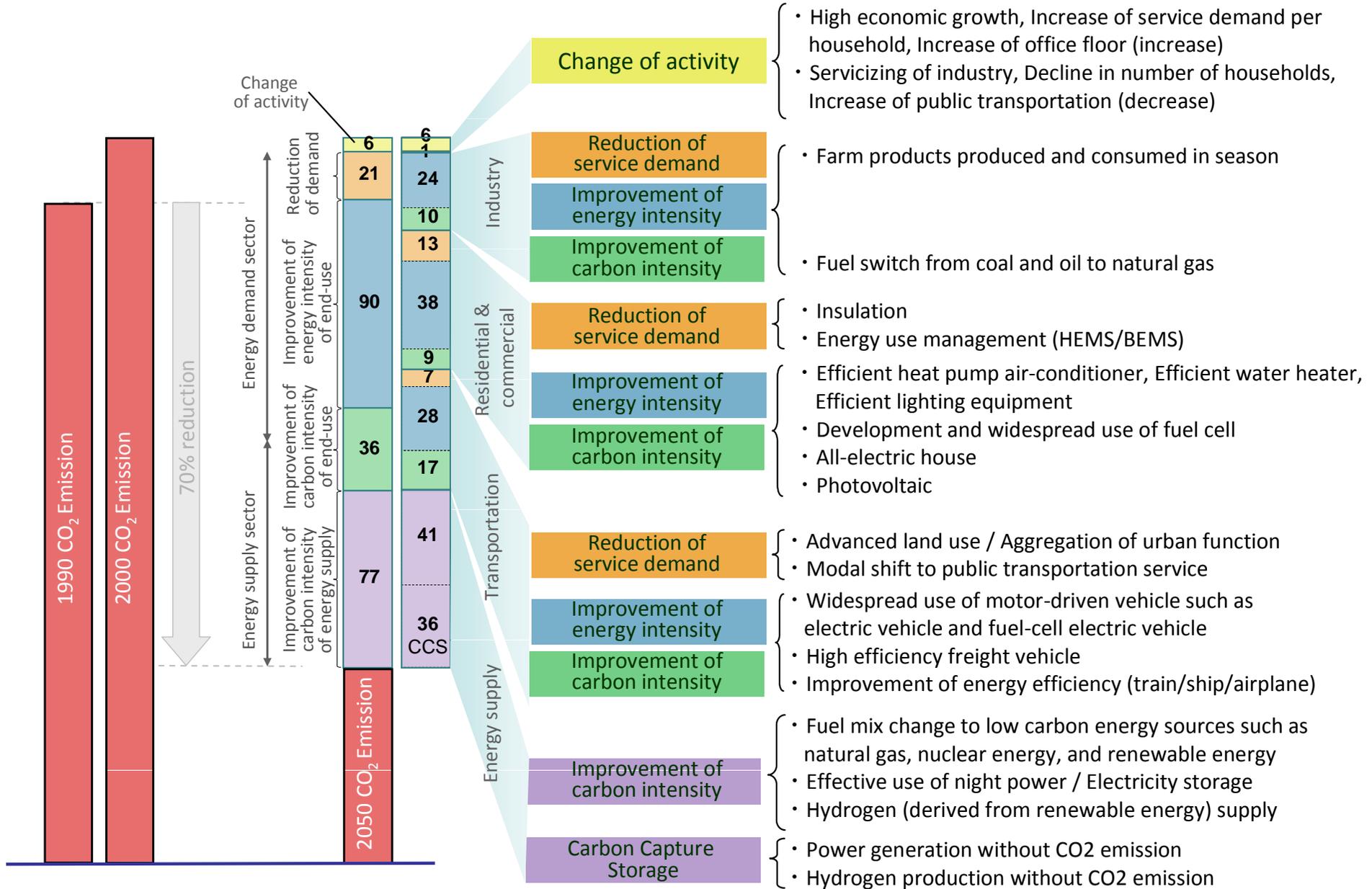
Study environmental options toward low carbon society in Japan



GHG 70% reduction in 2050 Scenario A: Vivid Techno-driven Society

Demand side energy -40% + Low carbonization of primary energy + CCS

with moderate cost of technological options as 0.3% of GDP in the year of 2050



A Dozen Actions towards Low-Carbon Societies

Press release
on May 22, 2008

Residential/commercial sector actions

1. Comfortable and Green Built Environment

Efficiently use of sunlight and energy efficient built environment design. Intelligent buildings.

2. Anytime, Anywhere Appropriate Appliances

Use of Top-runner and Appropriate appliances. Initial cost reduction by rent and release system resulting in improved availability.

Industrial sector actions

3. Promoting Seasonal Local Food

Supply of seasonal and safe low-carbon local foods for local cuisine

4. Sustainable Building Materials Using local and renewable buildings materials and products.

5. Environmentally Enlightened Business and Industry Businesses aiming at creating and operating in low carbon market. Supplying low carbon and high value-added goods and services through energy efficient production systems.

Transportation sector actions

6. Swift and Smooth Logistics

Networking seamless logistics systems with supply chain management, using both transportation and ICT infrastructure

7. Pedestrian Friendly City Design

City design requiring short trips and pedestrian (and bicycle) friendly transport, augmented by efficient public transport

Energy supply sector actions

8. Low-Carbon Electricity Supplying low carbon electricity by large-scale renewables, nuclear power and CCS-equipped fossil (and biomass) fired plants

9. Local Renewable Resources for Local Demand

Enhancing local renewables use, such as solar, wind, biomass and others.

10. Next Generation Fuels Development of carbon free hydrogen- and/or biomass-based energy supply system with required infrastructure

Cross-sector actions

11. Labeling to Encourage Smart and Rational Choices

Visualizing of energy use and CO2 costs information for smart choices of low carbon goods and service by consumers, and public acknowledgement of such consumers

12. Low-Carbon Society Leadership Human resource development for building "Low-Carbon Society" and recognizing extraordinary contributions.

Invitation to "Cool Earth 50"

~ 3 Proposals, 3 Principles ~

[National Campaign]

<For achieving Japan's Kyoto Protocol target>

With the motto of "1 person, 1 day, 1 kg", calling upon the people for efforts and creative ideas.

[Current Emissions]

1. U.S.A. 22%
2. China 18%
3. Russia 6%
4. Japan 5%
5. India 4%

[Mid-Term Strategy]

<"3 principles" in designing a concrete framework beyond 2013>

- (1) All major emitters must participate, thus moving beyond the Kyoto Protocol, leading to global reduction of emissions.
- (2) The framework must be flexible and diverse, taking into consideration the circumstances of each country.
- (3) The framework must achieve compatibility between environmental protection and economic growth by utilizing energy conservation and other technologies.

[Long-Term Strategy]

<For halving emissions by 2050>

[Innovative Technology Development]

- Eliminating emissions from coal-fired power generation
- Expanding safe and peaceful use of nuclear power
- Efficient solar power generation
- Promoting the use of next-generation automobiles such as fuel cell vehicles
- Technological innovation in industries such as iron production

[Building a Low Carbon Society]

- Lifestyles in harmony with nature
- Efficient public transportation system
- Compact urban development
- Demonstrating the sentiment of "mottainai" and the "Japan model" in the world

[Year 2050]

[Target which we propose setting as a common goal for the world]

Cutting global emissions by half from the current level

Developing Countries: about 60% (estimate)

Curbing to the same level as the capacity of natural sinks

Stabilizing the level of greenhouse gas concentrations in the atmosphere

To make "Cool Earth" a reality

<Japan's Role>

- Oil consumption has been reduced by 8% even though the GDP has doubled over the past 30 years.
- CO2 emission per GDP is the least in the major countries.
- Japan will create a new financial mechanism for assistance to the developing countries which respond to its proposals.
- Japan will expand the endeavor in East Asia for improving energy efficiency to the entire world.

2007. Apr.	Jun.	Sep.	Nov.	Dec.	2008. Jul.
Japan-China, Japan-U.S. Summit	Heiligendamm Summit (G8)	APEC Leaders' Meeting	East Asia Summit	COP13	Hokkaido Toyako Summit (G8)

Japanese PM outlines green 'Fukuda vision' on 9th June

- Japanese prime minister Yasuo Fukuda on Monday announced a new emissions trading trial set for this autumn and pledged to cut of 60-80 per cent of greenhouse gas emissions based on current levels by 2050.
- Under the new ETS scheme, countries will be able to impose upper limits on greenhouse gas emissions and issue credits to large firms.
- Japan will also set out a mid-term reduction target of a 14 per cent cut in emissions by 2020 based on of 2005 level, said Mr Fukuda.
- Japan will contribute up to \$1.2 billion to a new multilateral fund with the US and Britain to help developing countries fight global warming, Mr Fukuda said in his speech.
- Analysts said Tokyo is aiming to boost the perception that it is playing a leading role in fighting climate change at the July G8 summit in Hokkaido, where world leaders will meet to discuss arrangements for the successor to the Kyoto protocol, which expires in 2012.
- Japan says it will use more clean energy such as wind and solar and cut overall output, consumption and waste.
- Speaking at the Japan National Press Club, the Japanese premier outlined the 'Fukuda Vision', saying: "We must see the transition to a low-carbon society as an opportunity for new economic growth."
- Japan is currently the world's fifth largest carbon emitter.



July 7-9 2008, Hokkaido, Japan

Summary of the Hokkaido Toyako Summit

July 9, 2008

(2) Environment and Climate Change

- (a) Prime Minister Fukuda stated at the beginning that this was a very important summit, one that should determine whether humanity can move toward a low-carbon society, severing its dependence on fossil fuels and addressing challenges including global warming and resource depletion countries.
- (b) Long-term Goal
With respect to the goal of achieving at least 50% reduction of global emissions by 2050, the G8 leaders agreed to seek to share and adopt it with all Parties to the United Nations Framework Convention on Climate Change.
- (c) Mid-term Goals
In order to achieve absolute emission reductions in all developed nations, G8 leaders agreed to implement ambitious economy-wide mid-term goals.
- (d) Sectoral Approach
It was recognized that sectoral approaches are useful tools for achieving national emission objectives and for reducing GHG emissions.
- (e) Climate Investment Funds
G8 leaders welcomed and supported the establishment of the Climate Investment Funds administered by the World Bank to support the efforts of developing countries, and welcomed commitments from other donors.

Chair's Summary
G8 Environment Ministers Meeting
Kobe, Japan
May 24-26, 2008

Transitioning to low-carbon societies and establishing an international research network on low-carbon societies

5. To realize such long-term goals, it is necessary to change the current

socio-economic structures and transition to low-carbon societies. In so doing, there was general recognition of the importance of all the countries to have a clear vision of low-carbon societies. Strong support for establishing an international research network of institutions involved in the research on low-carbon societies was shown by a number of countries, and other countries also expressed their support for the consideration of its establishment.

**Chair's Summary
G8 Environment Ministers Meeting
Kobe, Japan
May 24-26, 2008**

Actions to realize low-carbon societies

- 6. To achieve low-carbon societies, all countries need innovations in their lifestyle, production and consumption patterns, and social infrastructure in addition to technological innovations. It was recognized that technology transfer and capacity building are necessary to achieve low-carbon societies at the global scale. The importance of research and development, information infrastructures and institutional planning was also pointed out. It was highlighted that there is a need to promote further development of technologies such as carbon capture and storage and biofuels. Carbon offsetting was also recognized as an effective mechanism that provides a wide range of stakeholders such as citizens, companies, and governments with opportunities to contribute to mitigation actions. It was observed that in shifting toward low-carbon societies, international cooperation on carbon offsets will play an important role.*

Carbon Reduction in Portland Strategies and Success

City of Portland
Office of Sustainable Development



Megan Stein

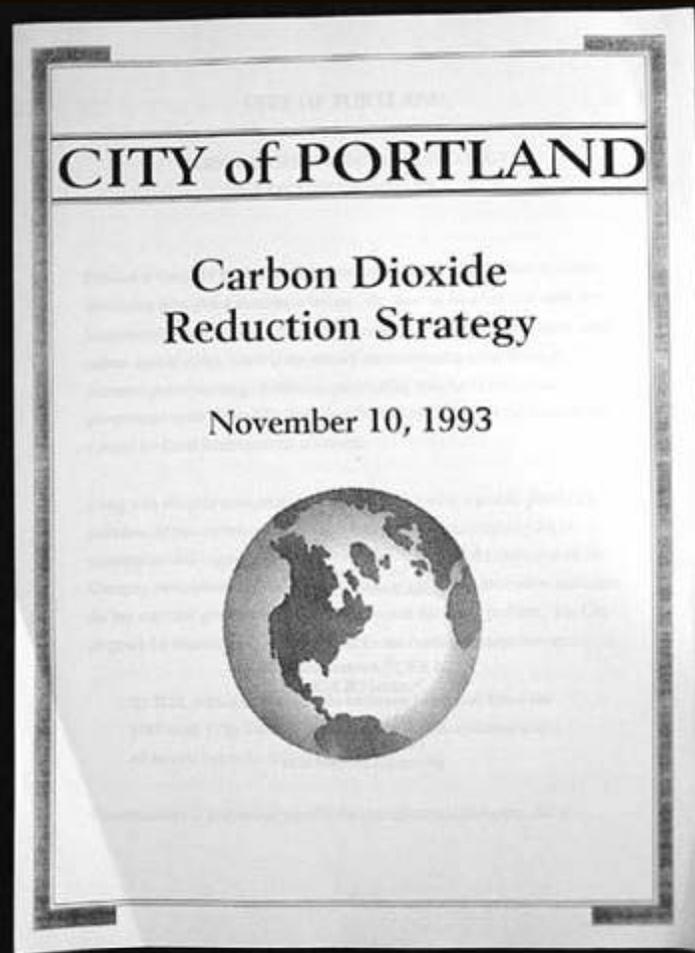
City of Portland Office of Sustainable Development

Portland Profile

We are here!



1993 Carbon Dioxide Reduction Strategy



Built on 1979
Local Energy Plan

Integrated Energy with:

- Housing
- Land Use
- Transportation
- Business



2001 Local Action Plan on Global Warming

City of Portland
Office of Sustainable Development



CO₂ Reduction Goal:

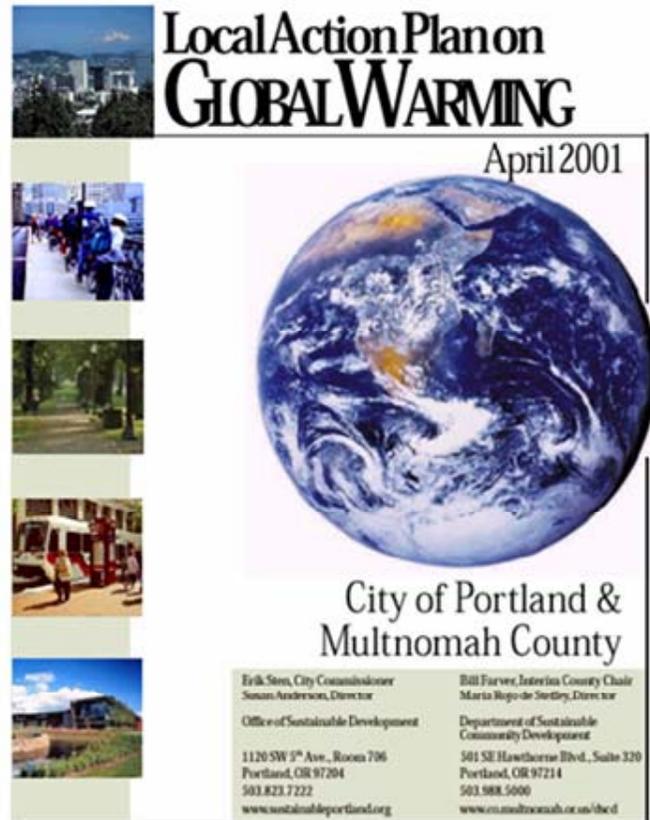
- 10% below 1990 levels by 2010

Over 100 government actions & community initiatives

- Policy
- Renewable Energy
- Transportation
- Buildings
- Solid Waste
- Forestry

2001 Local Action Plan on Global Warming

City of Portland
Office of Sustainable Development



**Local Action Plan on
GLOBAL WARMING**
April 2001

City of Portland &
Multnomah County

Erik Stein, City Commissioner
Susan Anderson, Director
Office of Sustainable Development
1120 SW 3rd Ave., Room 706
Portland, OR 97204
503.823.7222
www.sustainableportland.org

Bill Farver, Multnomah County Chair
Maria Rago de Souto, Director
Department of Sustainable
Community Development
501 SE Hawthorne Blvd., Suite 320
Portland, OR 97214
503.988.5000
www.co.multnomah.or.us/bcd

- Energy
- Transportation
- Green Building
- Recycling and Composting

Energy



Internal energy efficiency and renewable energy efforts save the City over \$2.7 million annually

- **Biogas generation, representing \$500,000 annual savings**
- **Solar panels, hydroelectric turbines and a small wind turbine**



Energy



- Portland's operations use 173 million kWh per year
- Roughly \$13 million
- 100% renewable energy for City operations by 2010

2001 Local Action Plan on Global Warming

City of Portland
Office of Sustainable Development



- Energy
- Transportation
- Green Building
- Recycling and Composting



Transportation

➤ Urban Growth Boundary





INTERSTATE MAX — 2004



I-205 MAX — 2008



FUTURE MAX CORRIDORS



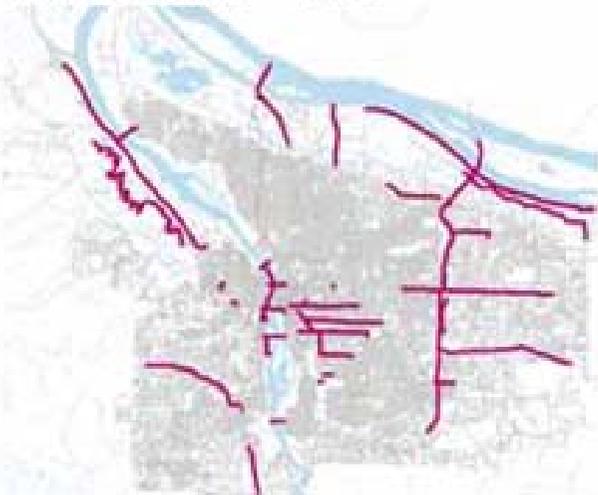
BIKE NETWORK — 1993



BIKE NETWORK — 2003



BIKE NETWORK — 2016



Transportation



- Renewable Fuels Standard
 - All Diesel = 5% Biodiesel
 - All Gasoline = 10% Ethanol
 - 2010 = 10% Biodiesel



2001 Local Action Plan on Global Warming

City of Portland
Office of Sustainable Development



- Energy Use
- Transportation
- Green Building
- Waste Reduction & Recycling

Green Building



LEED Gold certification required for municipal owned buildings:

- **New construction**
- **Existing buildings and remodels**
- **Special requirements for roofs and re-roof projects**

LEED Silver certification for city funded, private projects



2001 Local Action Plan on Global Warming

City of Portland
Office of Sustainable Development



- Energy
- Transportation
- Green Building
- Recycling and Composting

Recycling and Composting



- 63% Recovery Rate
- 75% Recovery Goal
- Mandatory recycling for businesses and construction sites
- Mandatory composting for food generators

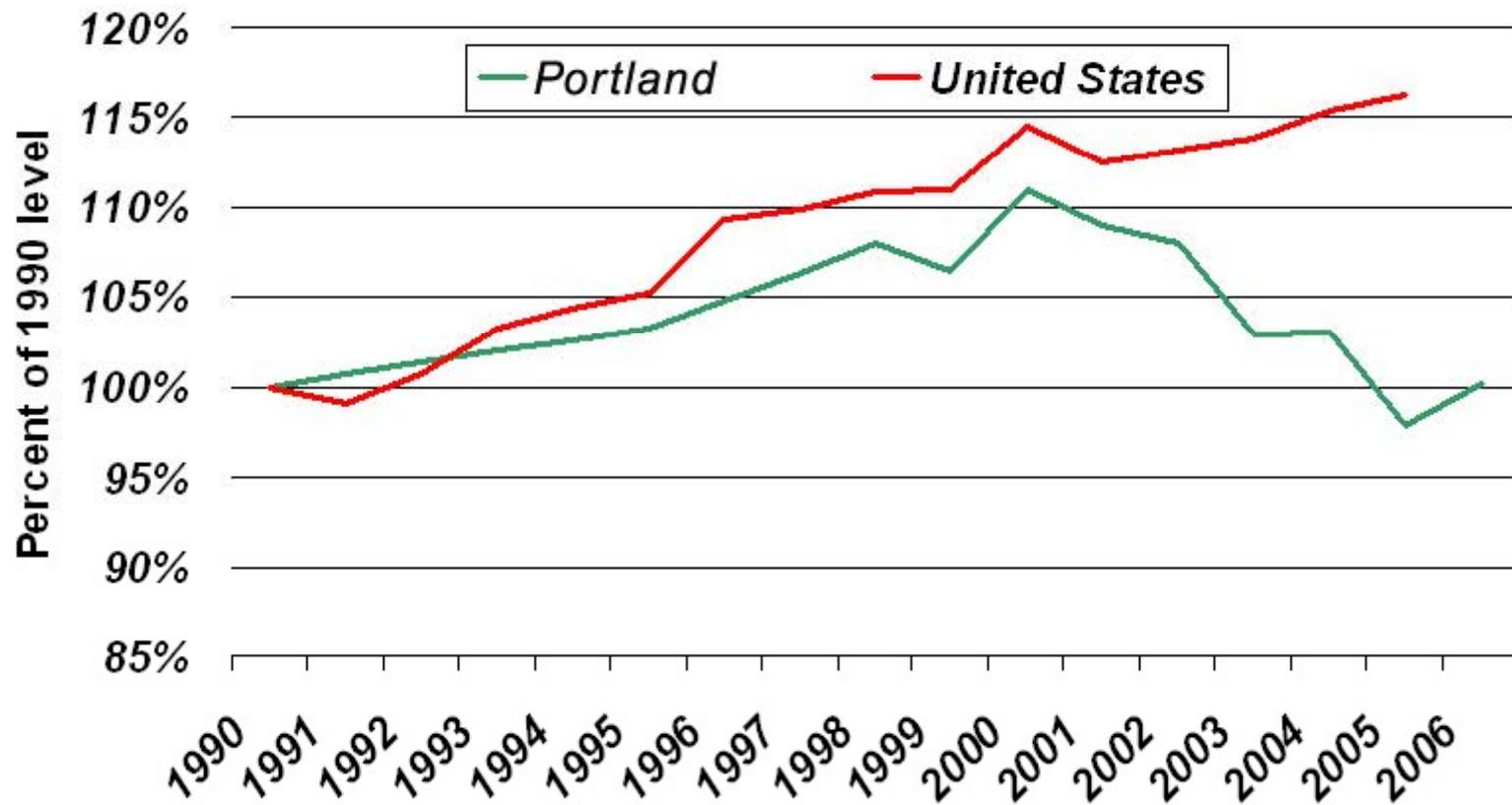


Accomplishments

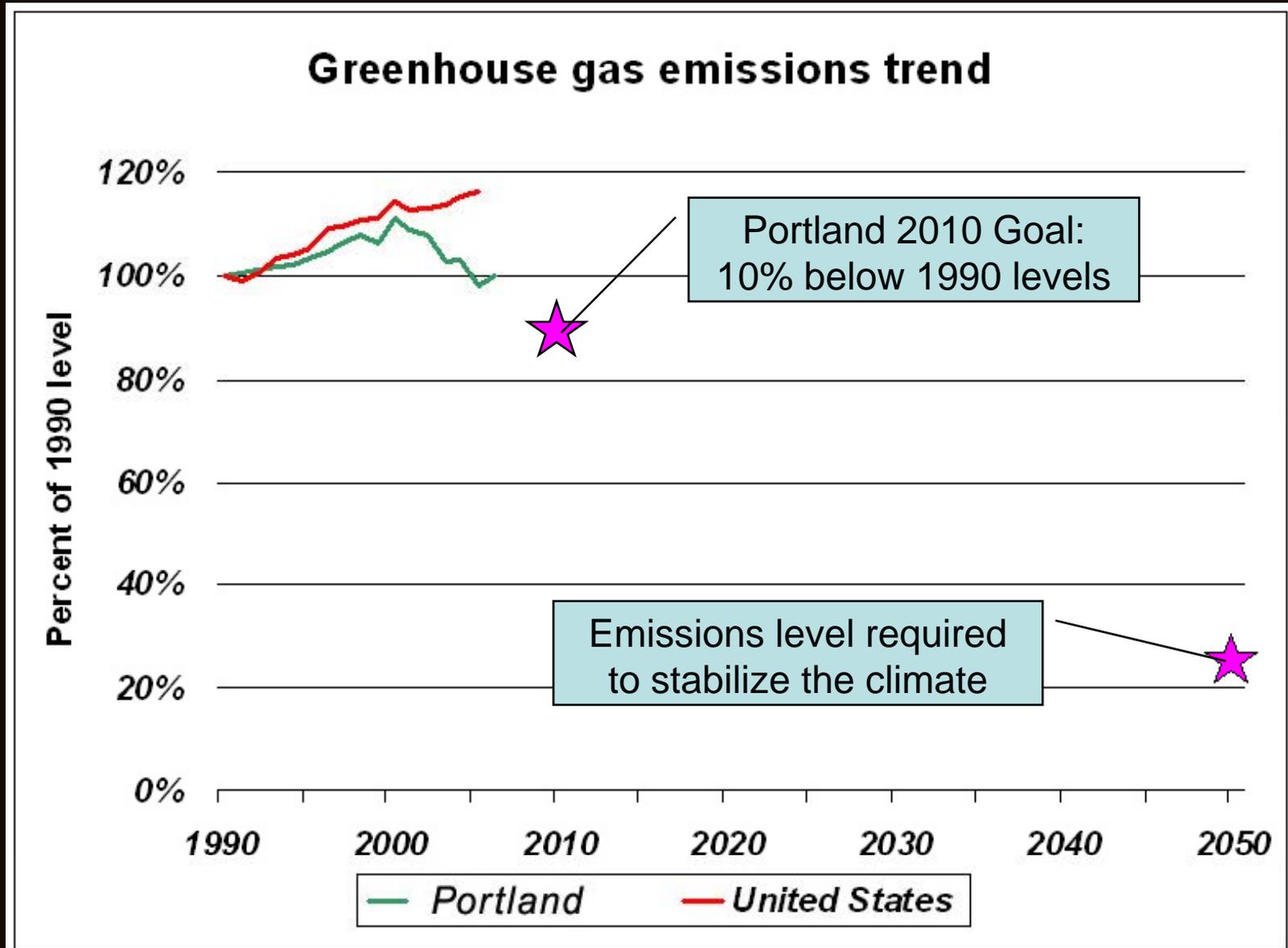
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Greenhouse gas emissions trend

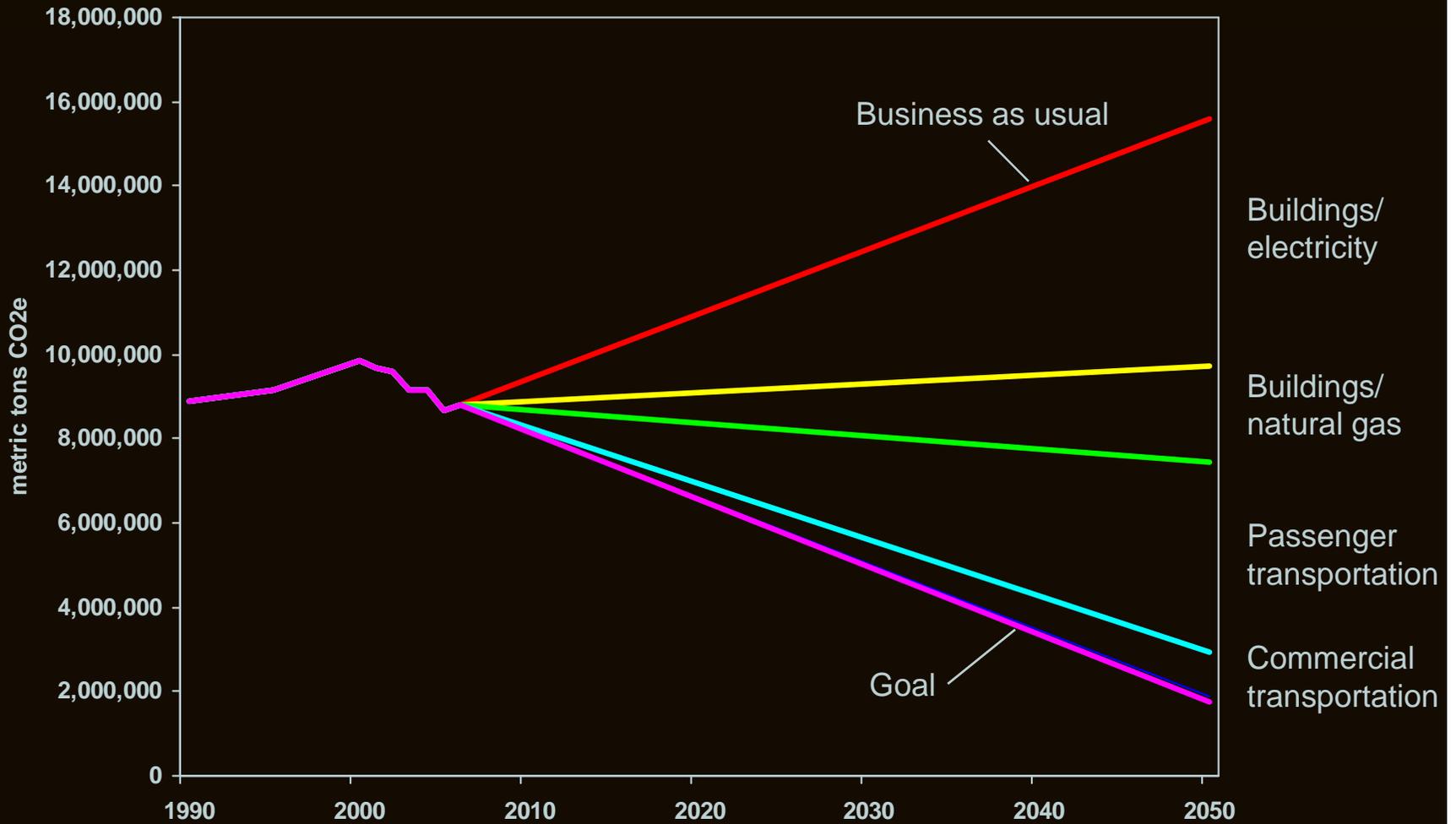


Achieving the New 2050 Goal



Achieving the New 2050 Goal

City of Portland
Office of Sustainable Development





Achieving the New 2050 Goal: Possible Strategies

- **Establish an investment fund to leverage private capital to finance comprehensive energy efficiency improvements and clean distributed generation**
- **Require energy performance ratings for residential and commercial buildings at time of sale**
- **Require all evaluations of land use options to include forecasts of greenhouse gas impacts**
- **Make it possible for residents to access key community goods and services within walking distance**

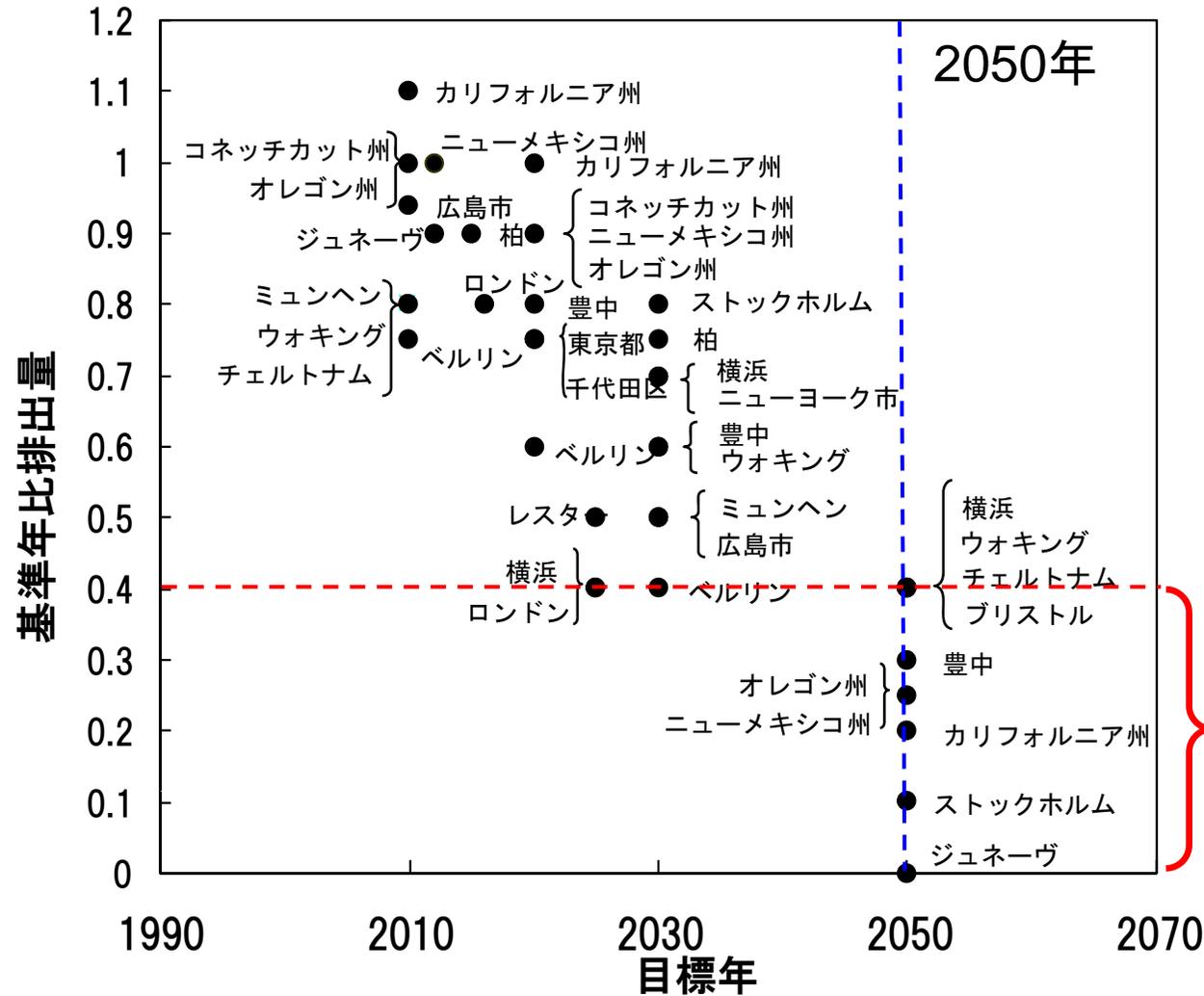
www.PortlandOnline.com/OSD

City of Portland
Office of Sustainable Development



mstein@ci.portland.or.us

地方自治体の低炭素社会目標

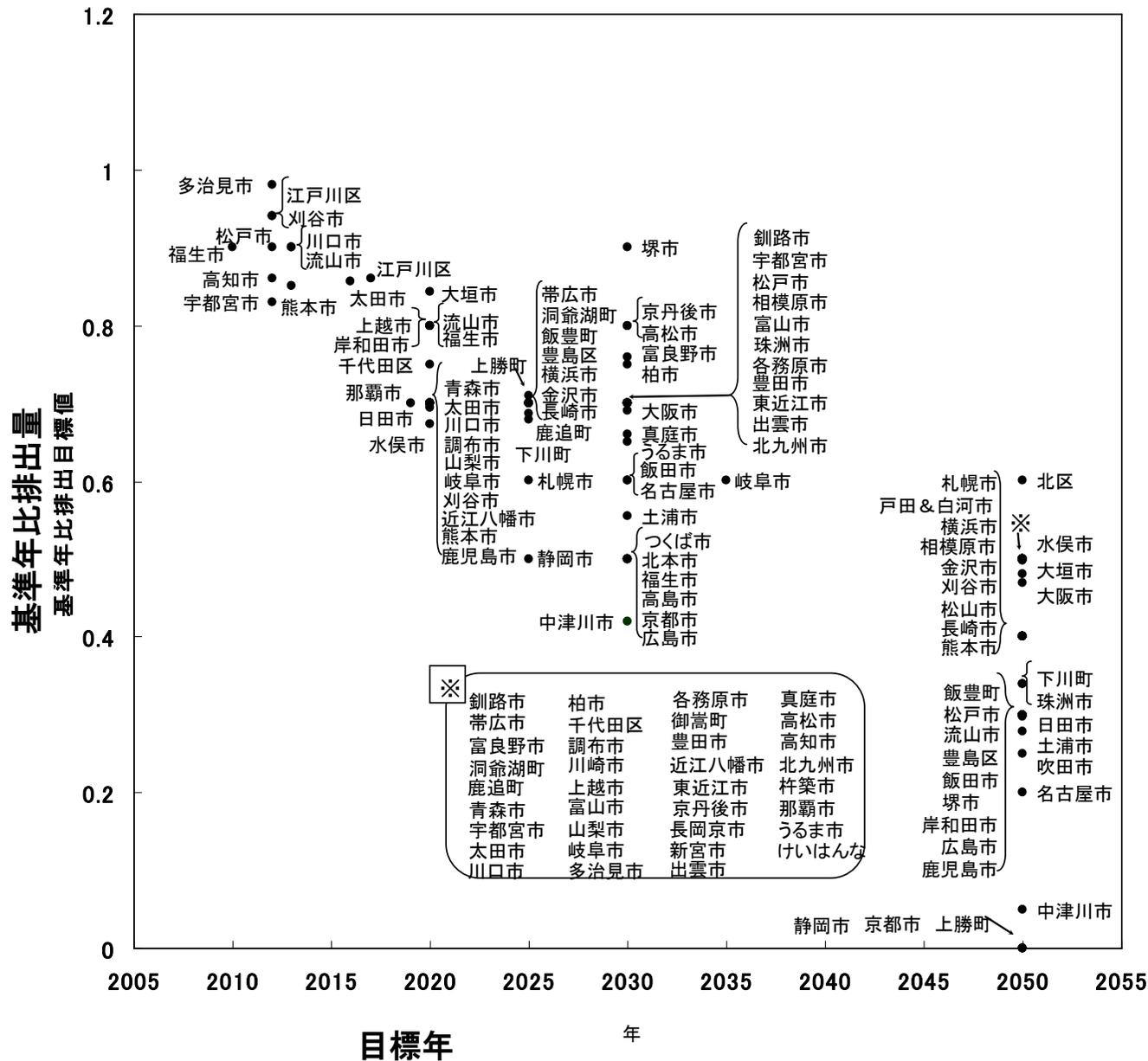


目標値はそれぞれの地域での基準年比排出量。

基準年は地域によって異なるが、1990年が多い。

60%~100%削減目標

環境モデル都市プロジェクト(内閣官房地域活性化統合本部、2008)に提案された温室効果ガス排出削減目標



- 82件(89自治体)の応募、
- 大幅な削減目標や実現可能性、地域の特色など、五つの選定基準により、
- 環境モデル都市として、6自治体(北海道帯広市、北海道下川町、横浜市、富山市、北九州市、熊本県水俣市)、
- 「環境モデル候補都市」として、東京都千代田区、長野県飯田市、愛知県豊田市、京都市、大阪府堺市、高知県梼原町、沖縄県宮古島市を選んだ。

Japan-UK Joint Research Project

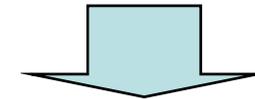
LCS through Sustainable Development for Global Participation

The **First** workshop was held
in Tokyo, June 14-16, **2006**.

Participants from 19 countries;
Asia: Japan, China, India, Thailand,
Taiwan (China)
Africa: South Africa, Nigeria
Europe: UK, France, Germany,
Denmark, Spain, Netherlands, Russia
Latin America: Brazil, Mexico, Chile
North America: US, Canada



G8 Gleneagles 2005



G8 Japan
July 2008

The **Second** workshop was held
in London, June 13-15, **2007**.

The **Third** workshop was held
in Japan, Feb 13-15, **2008**.

Developing and Diffusing Innovations
for our good life and LCS through SD





Japan-UK Joint Research Project Sustainable Low-Carbon Societies (LCSs)

In 2006, the Governments of Japan and UK established an innovative joint research project with participation from a diverse group of some 20 countries.

■ Launch of the Project : 16th Feb 2006 (Anniversary of Kyoto Protocol)



Former Japanese Environment Minister Yuriko Koike and UK Ambassador to Japan Sir. Graham Fry announced the launch of the joint research of the Low-Carbon Societies (LCSs)

■ 1st Workshop: June 2006 Developing Visions for a LCS through Sustainable Development



Tokyo

- A long-term perspective focusing on the need for urgent action to reduce CO₂ towards 2050.
- Achievement of LCS will involve the development and deployment of low carbon technologies, changes to lifestyles and institution, and need to align with sustainable development.



Japan-UK Joint Research Project Sustainable Low-Carbon Societies (LCSs)

In 2006, the Governments of Japan and UK established an innovative joint research project with participation from a diverse group of some 20 countries.

■ 2nd Workshop: June 2007 **Achieving a Sustainable LCS**



London

- A wide range of stakeholders- from government, business, and civil society need to be engaged in finding solutions.
- A significant share of GHG is due to cities. Effective Action can be and is being undertaken.

■ 3rd Workshop: Feb 2008 **Roadmap to Low Carbon World**

Tokyo



Co-chairs:

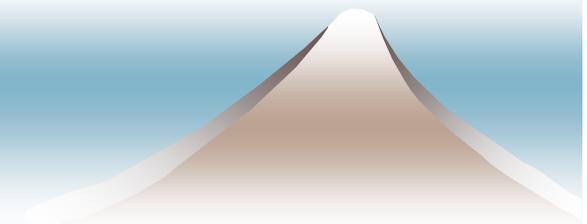
Shuzo Nishioka(NIES), Jim Skea(UKERC)

- Creation of appropriate incentives for business using long-term policy signals to strengthen carbon pricing.
- Expanding financial flows, international cooperation in low-carbon approaches.
- Building trust between countries and stakeholders though enhancement of communications is important.

Group 1

- ◆ **Group1: Behavior change and its impact on delivering LCSs**
- ◆ **Group chairs: Jeremy Watson (Arup, UK) and Yuichi Moriguchi (NIES, Japan)**
- ◆ **Rapporateur: Steve Cornelius**

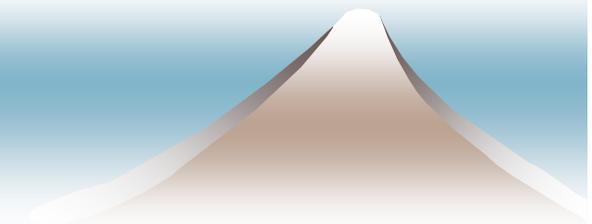
- ◆ **Key Questions**
- ◆ **What are the main levers in behaviour change, what barriers need to be overcome?, and**
 - **What roles exist for different actors i.e. individuals, businesses, Governments, etc?**
 - **What are the roles of policy options, including regulations and setting standards, for behaviour change?**
 - **In particular, how consumption patterns of the developed countries can be tackled in the context of behavior change?**



Group 2

- ◆ **Group2: Delivering LCS through Sustainable Development**
- ◆ **Group chairs: P.R.Shukla (IIM, India), Taka Hiraishi (IGES, Japan)**
- ◆ **Rapporateur: Sunil Malla (Technology Consultancy Services, Kathmandu), Tomoki Ehara (MHIR)**

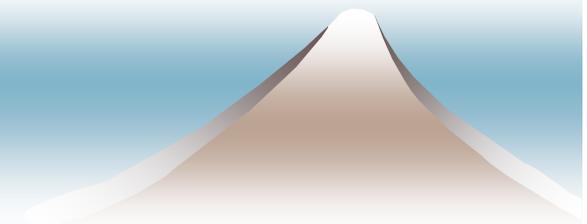
- ◆ **Key Questions**
- ◆ **What are the differences among developing countries in terms of adapting to and mitigating the climate change?**
- ◆ **What are the differences between SDPAMs and LCS approaches and what advantages do LCS approaches provide to achieve SD?**
- ◆ **How approaches to LCS can be integrated into SDPAMs?**



Group 3

- ◆ **Group 3: Enabling LCSs: Investment**
- ◆ **How to inspire innovation, driving force to make it happen**
- ◆ **Group chairs: Jose Garibaldi (Enegeia Mexico), Takejiro Sueyoshi (UNDP)**
- ◆ **Rapporteur: Andy Bolhito**

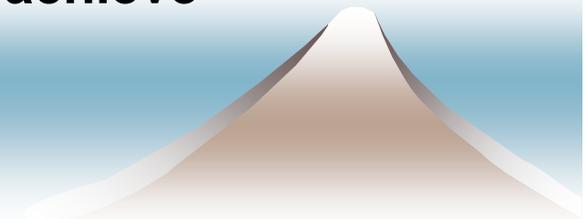
- ◆ **Key Questions**
- ◆ **What conditions (rules, institutions, price signals) will stimulate investment for LCSs?**
- ◆ **How do we create the necessary incentives to drive and enhance innovation?**
- ◆ **What are the roles of the governments to make necessary investments happen?**



Group 4

- ◆ **Group 4: Barriers and opportunities: approaches to sensitive LCS sectors**
- ◆ **Wiping out concerns, bright futures, level playing fields, impacts to industry and other sectors**
- ◆ **Group chairs: Jim Watson (SPRU, UK), Naoya Tsukamoto (MoEJ, Japan)**
- ◆ **Rapporateur: Jiang Kejun and Toshi Arimura**

- ◆ **Key Questions**
- ◆ **What sectors are most sensitive and/or vulnerable in the transition to LCS?**
- ◆ **What kind of inertia hinders transition to LCSs (concepts, social systems, economic systems, infrastructure, etc)?**
- ◆ **What opportunities exist for such sectors in new “green” markets and what policy measures exist to achieve international level playing fields?**





Behaviour Change and its impact on delivering a Low-Carbon Society

Co-chairs – Yuichi Moriguchi, Jeremy Watson

Rapporteur – Stephen Cornelius

Overview

- Leadership
- Instruments to drive Behaviour Change
- Tools for Behaviour Change
- Markets
- Psychology of Behaviour Change
- Timely and appropriate Behaviour Change
- Engagement



Leadership

- **Governments are expected to play a leading role by creating enabling frameworks**
 - business want a framework with an appropriate balance of incentives and penalties and with long-term policy certainty
 - consumers welcome leadership and clear vision from governments rather government inaction
- **Each group sees the onus to act first as being the responsibility of the others (government / business / individuals)**



Instruments to drive Behaviour Change

- **Regulation**

- standards – e.g. worst choices made less attractive or removed
- obligations – e.g. mandatory emissions reduction targets

- **Monetary**

- fiscal (taxes and incentives – e.g. London congestion charge)
- procurement – e.g. C40 (energy efficiency purchases for public buildings)
- emissions trading

- **Exemplar projects**

- low-carbon, low waste housing (e.g. BedZED)



Tools for Behaviour Change

- **Information / guidance**

- product labelling – e.g. life-cycle costs, energy ratings
- household- and company-level emission inventory – e.g. energy meters & accounting
- web resources – e.g. carbon calculator
- support on how to change behaviour – e.g. advice helpline
- learning networks
- mass media

- **Availability of suitable alternatives / choices**

- product versus service choice
- transport modal shift



Markets

- **Recognise the value of market-based instruments to influence behaviours in the medium to long-term**
 - need a price on carbon (i.e. value on emission reduction)
 - power of informed consumer choice (e.g. consumer-durables)
- **Supply (production) and Demand (consumption)**
 - decarbonising energy supply (e.g. renewables, CCS, nuclear)
 - the benefit of incremental efficiency improvements may be offset by increased consumption (rebound effect) and switching to more energy intensive alternatives



Psychology of Behaviour Change

- **Encourage positive attitude**
 - not “don’t” but “let’s do”
 - small individual actions can be cumulatively powerful (e.g. recycling)
 - turn aspirations to be greener into actions that matter
 - Change should be desirable – fashionable and fun!
- **Change mind-set**
 - consumer items not as important as the service they provide
 - become aware that ownership carries responsibility
 - focus on quality-of-life rather than on mass-consumption and disposal
- **Social responsibility and peer pressure**
 - family, neighbours, colleagues



Timely and appropriate Behaviour Change

- **Need more than incremental changes to rapidly transition to LCS**
 - move LCS philosophy from the periphery into the mainstream
 - likely to involve paradigm shifts
- **Recognising difference in circumstance**
 - strategies for LCS will vary for different countries – depending on national circumstance (resource endowment, development level etc)
 - city-level action may also differ due to varying opportunity to act
 - leapfrogging – assistance to develop on a low-carbon pathway through appropriate technology transfer, financing and investment, joint venture exemplar projects etc



Engagement

- **Broad participation is needed to achieve a LCS**
 - actions are required by all stakeholders – citizens, corporations and government
- **Government**
 - city plans should be at least enabled and preferably supported by national frameworks
 - advanced city-level action can be used as pilots for national action



Report from
Group 2:
“Delivering LCS through
Sustainable Development”

Recognitions

- “Developing countries” include a vast range of countries, with differences in, for instance, population, natural resource endowment, stage of economic development, as well as political or geological conditions. Therefore, It is not proper to elaborate LCS questions monotonally on “developing countries”.
- LCS actions and SD actions are required in both developed and developing countries, in line with their needs, priorities and within the available resources.
- The Group elaborated the LCS issues with a broad time framework of “LCS by 2050”, while the Group was fully recognizant of the urgency of climate actions, in particular, viz. extremely vulnerable countries. The Group also considered that actions towards “by 2050” would contain many early actions even in the near future term”.

Recognition (2)

- SD is meant to achieve sound development, addressing many important issues such as; poverty, equity, health, technology, etc., which would not prevent development of future generations.
- SD concept has been with us for a couple of decades (cf. Brundlunt Report (1987)), but there are numerous “definitions” reflecting the underlying background and the purpose of use. While essentially all the countries are committed to seek for its implementation, many countries are faced with a variety of difficulties.

Major Conclusions

Relationship between LCS and SD

- The Group believes that between LCS and SD, there are many commonalities and, possibly, many mutually supportive components.
- **Detailed analysis** of this aspect might be not only academically interesting, but it might accrue to valuable hints for future international actions on LCS/SD and on leap-frogging of developing countries, **though It would take significant time and resources.**

Provision of Visions on LCS

- Rather, the Group considered, as a matter of priority, dissemination and provision of “visions on LCS” to the world community is imperative, so that governments and relevant stakeholders can take well-informed and timely actions towards LCS.
- For this purpose, the Group recommends that a detailed information/guidance package on LCS should be prepared in the UK-Japan LCS scheme. [“Visions”]

“Visions on LCS” (1)

The “Visions on LCS” should address issues such as: Principles, Considerations, Means or Options. More specifically; The Visions should;

- be clear that appropriate pathways to (certain types of) LCS, would not hamper economic growth.
- state that LCS and SD should be synergistic.
- be clear on societal benefits, expected from LCS.
- propose a set of principles on Government’s intervention.
- allow dynamic and proactive changes in the course of process towards LCS.

“Visions on LCS” (2)

The Visions should also;

- offer options (of individual policies), tools, and means (including international actions), possible phased approaches and steps, as well as proposed timeline of actions.
- address requirements (especially, funds, technologies and human resources), and possible actions or means to obtain them.
- contain considerations on Implications on, and, by other policies, including fiscal policies (e.g., subsidies).

“Visions on LCS” (3):

For the purpose of facilitation, the Visions should also;

- share good examples, or show cases.
- contain discussions on cautions: eventual problems in policy implementation (use of LCA?).
- consideration immediate (developmental) needs, of developing countries.

What LCS model can offer?

What LCS model should answer?