The Necessity of Energy Conservation in the Buildings Sector, and Tokyo's Policies

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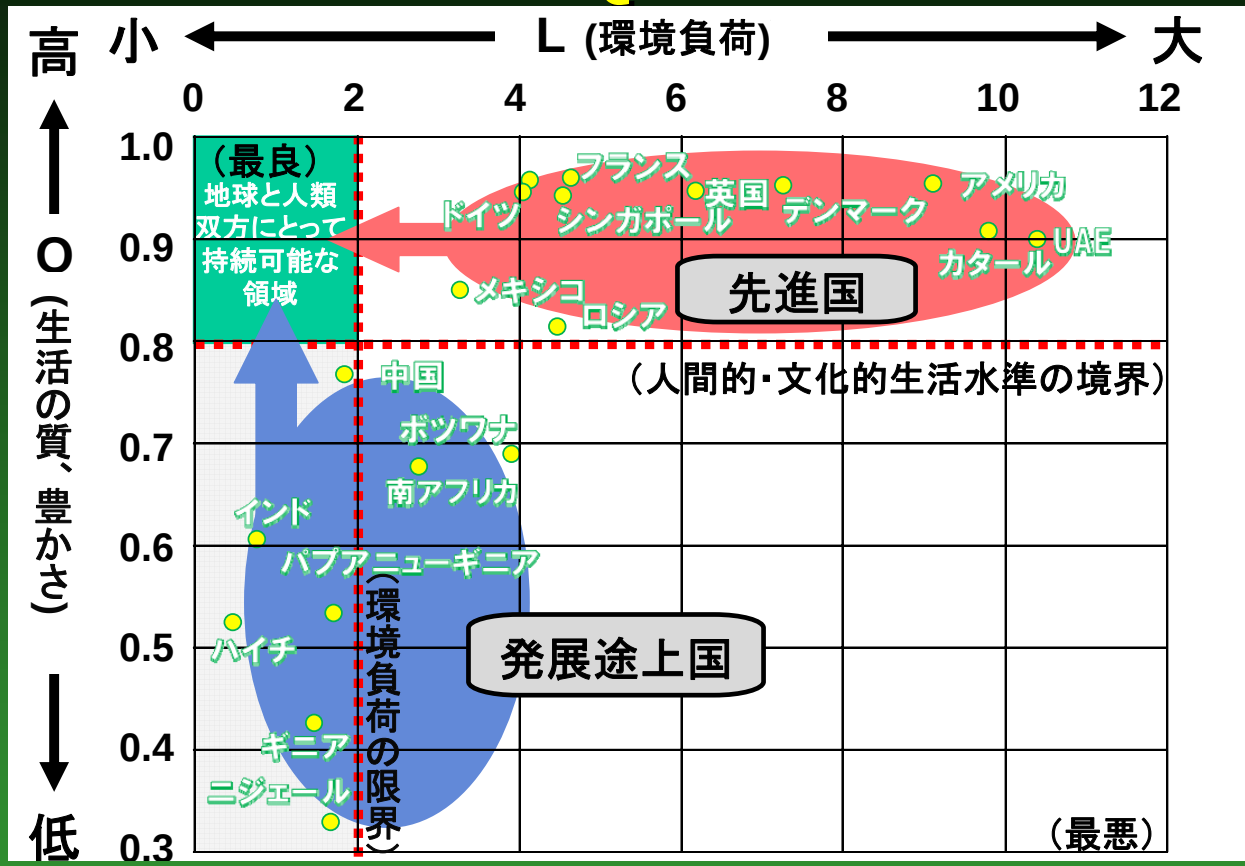
1. Global and Human Sustainability Evaluation: Based on Q and L

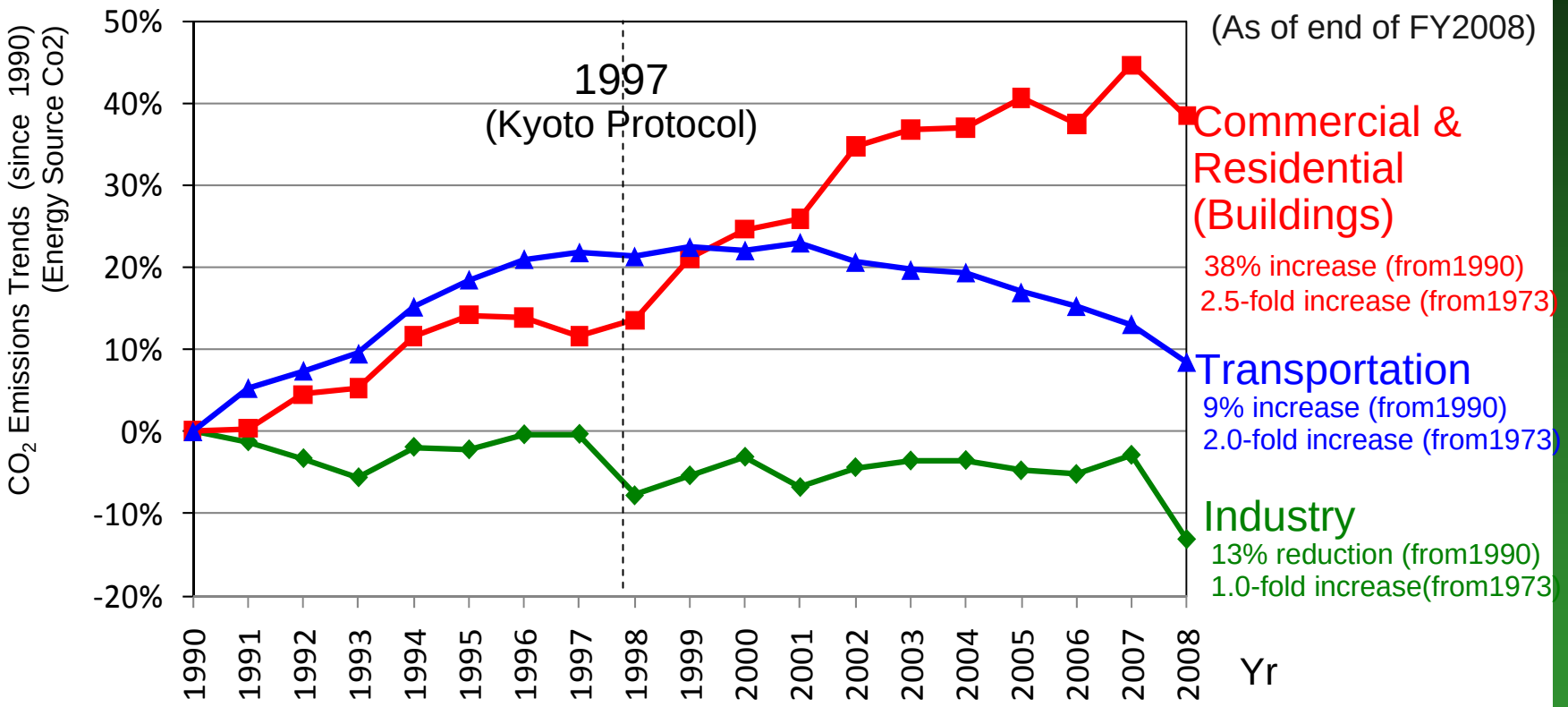


- ⇨ The risk to the sustainability of the globe and human beings is clear
- ⇨ It is urgent that reducing L in developed countries, while Q be improved and halting the rise of L in developing countries
- ⇨ Demanded level of energy savings and CO_2 reductions

Q: Human Development Index L: Ecological Footprint

Source: Global Footprint Network, How We Can Bend the Curve, Global Footprint Network 2009 Annual Report

2. Energy Consumption Trends in the Commercial & Residential, Industry, and Transport Sectors



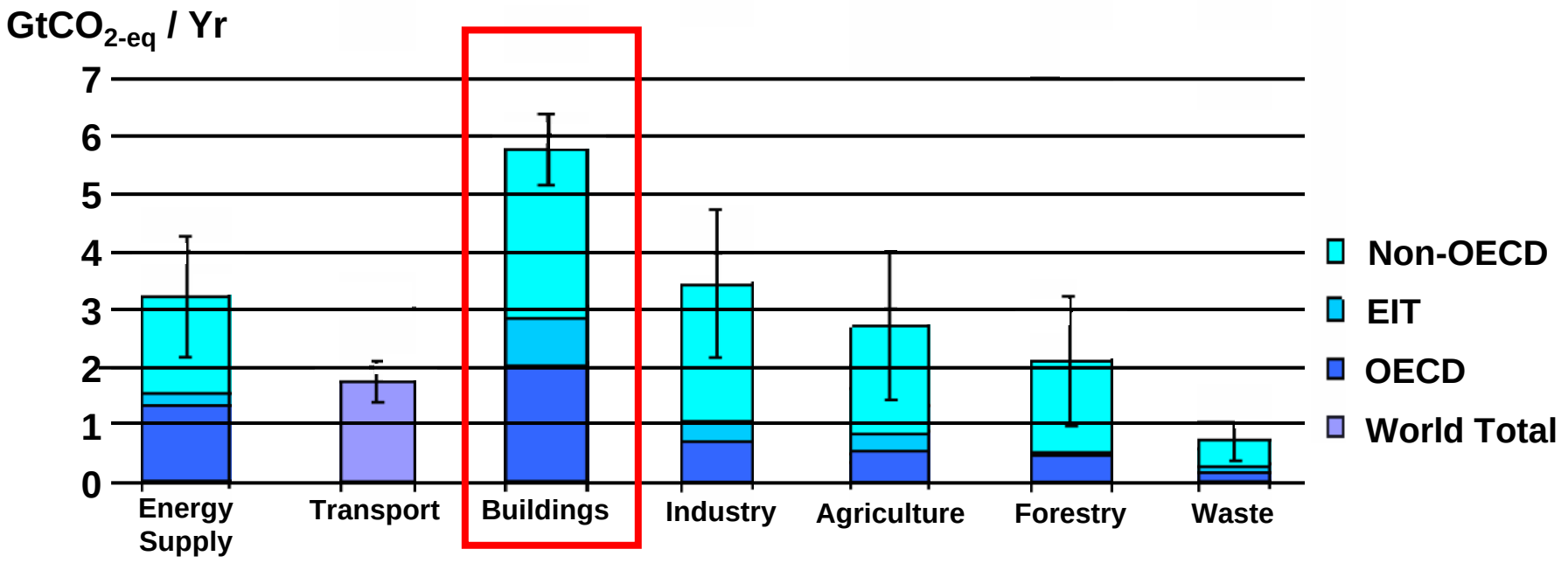
Source: National Institute for Environmental Studies Greenhouse Gas Inventory Office (FY2008 preliminary report)

⇨ Sharply rising commercial & residential sector

⇨ World-wide trend

3. Enormous CO_2 Emissions Reduction Potential in the Buildings Sector

Estimated reduction potentials by sector by 2030 (IPCC)

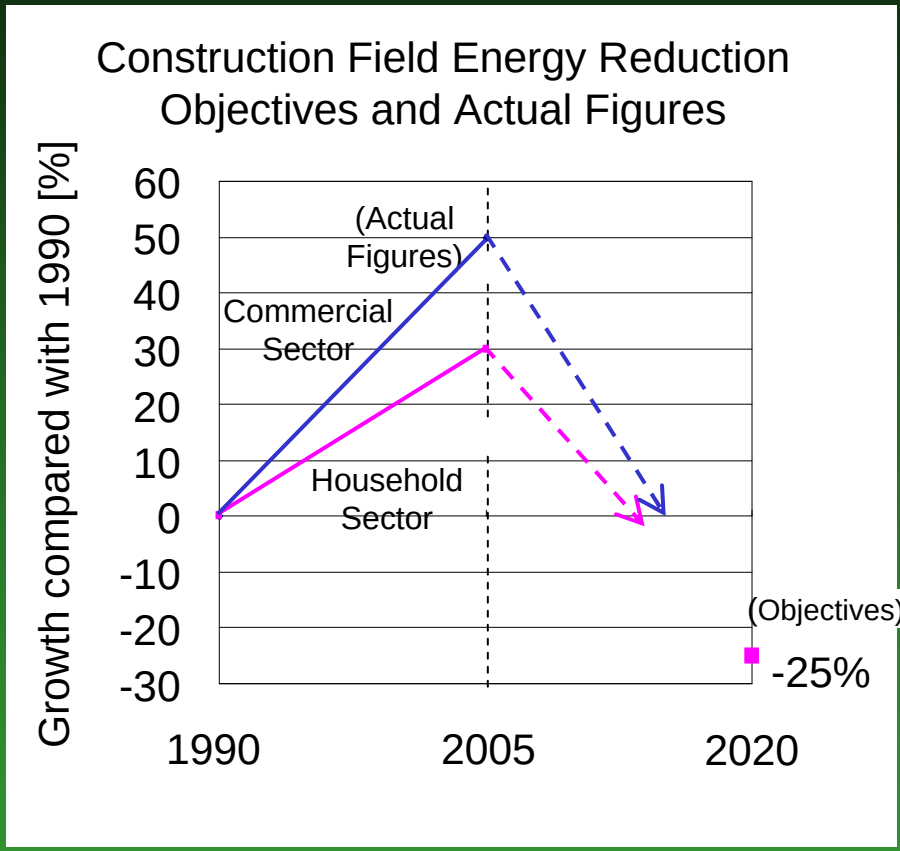


(Marginal CO_2 reduction cost assumed $50 or less)

Source: 4th IPCC Report 2007

- Further energy conservation and CO_2 emissions reductions expected in the buildings sector
- Accelerating introduction of energy conservation measures in EU and the rest of the world

4. Midterm Target (-25%) and a Paradigm Shift on Building Energy Conservation



1) 1990 to 2005

⇨ Commercial sector
Approx. 50% increase
Residential sector
Approx. 30% increase

2) Need for large-scale reductions within consumer & residential sector in order to meet the nationa midterm objectives

⇨ Paradigm shift from large-scale increase to large-scale decrease

⇨ Promotion of new energy conservation policies to overturns conventional paradigm

5. Tokyo's Leading Policies & Programs on Energy Conservation /CO_2 Emission Reductions (1/3)

Primary Program 1

TMG Green Building Program (Enacted in 2000, started in 2002)

A program of environmental performance evaluation and public release of evaluation results of new buildings (＞5,000m^2 total floor area)

⇨ This system developed, reaching fruition with the labeling system

* Condominium environmental performance display system (enacted 2005)
* Business building energy saving performance evaluation document system (enacted 2010)

⇨ Various measures, such as (1) increasing energy saving standards, and (2) demanding high energy performance through comprehensive design systems, etc., were launched utilizing this system

6. Tokyo's Leading Policies & Programs on Energy Conservation /CO2 Emission Reductions (2/3)

Primary Program 2

Tokyo Cap and Trade Program (Enacted in 2008, started in 2010)

World's first cap and trade system targeting at CO_2 emissions from buildings

⇨ This program:

* Total emission reductions mandated for most of the large buildings in Tokyo, accelerating energy savings and renewable energy use

* Trading system resulted in wide-reaching effects throughout Japan, such as the development of renewable energy projects

7. Tokyo's Leading Policies & Programs on Energy Conservation /CO2 Emission Reductions (3/3)

Example 1:

Tokyo Low Carbon Building TOP30

* Select and publish TOP 30 low emission buildings in Tokyo as a result of these two primary measures

* Effect of widely publicizing the leading technologies of low emission buildings, and the hard work of the architects and engineers behind them

Example 2:

Leading measures by TMG have a large impact in energy conservation policies of local and national governments

⇨ Has also been positively evaluated as an excellent example of demand-side measures by cities worldwide

6. Future Direction of Energy Use in Commercial & Residential Sector

1. Steep increase of energy consumption in commercial & residential sector, and limits of measures focused on buildings themselves

⇨ Move targets from individual buildings to district / region / city scale measures

⇨ Smart meters, smart grids, smart communities, etc.

2. Shift from measures focused only on the demand or supply side to comprehensive measures focused on both the demand and supply sides

⇨ Shift from current centralized systems to coexistent centralized and distributed systems

3. Shift to energy supply and demand system that includes incentives for consumers stimulating energy savings

⇨ Dynamic pricing, etc.

⇨ Keywords: Distributed, networked, and bidirectional system, renewable, on-site, locally production and locally consumption, consumer participation

7. Towards the Establishment of an Ultra-Low Energy Society

1. Energy supply side issues

* Reexamination of nuclear energy use
* Reexamination of breakaway policies from fossil energy

⇨ Increase in carbon emissions

2. International demands for further carbon reductions, given the restrictions described above

3. Given these trade-off conditions, how can QOL be improved while conserving electricity and reducing carbon emissions?

⇨ "Ultra-low energy use" in the buildings sector as most effective measure

4. Discomfort will be unavoidable in various sectors including consumer and industries

⇨ Balanced policy design to share such discomfort, and consensus formation in the nation

⇨ Hopes pinned on TMG leadership

Thank you for your attention