

# Recent Research and Development Activities in BRI, Japan



10, Oct. 2009

Hiroshi Ito

Deputy Chief Executive,

Incorporated Administrative Agency BRI, Japan



1



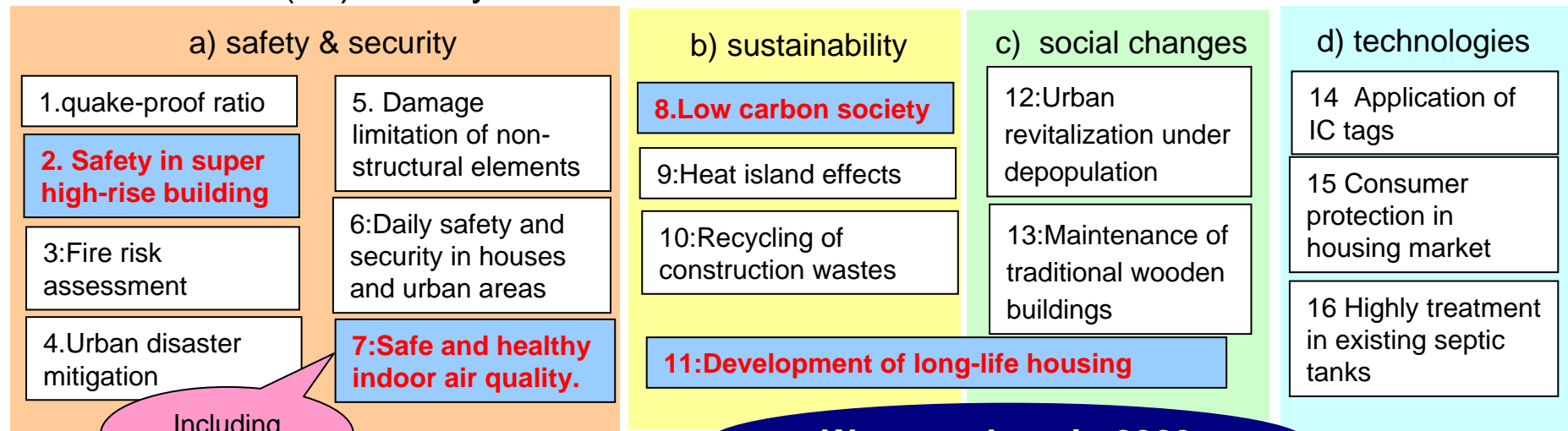
# Priority Research & Development themes in BRI

BRI has now given priorities to following new sixteen (16) themes, responding to rapid changes in social and economic needs, in housing, building and urban planning fields, under following new four (4) key concepts, in March, 2009.

## Four (4) Key Concepts



## New sixteen (16) Priority R&D Themes



Including Asbestos

We start them in 2009

# Construction of low carbon society

## Changes in social and economic situations

Enforcement of new energy regulation in April 2009

IPCC's 4th evaluation report in Nov. 2007

Communiqué of G8 Summit in Hokkaido Toyako in July 2008

Action plan for low carbon society as the decision by the Cabinet in July 2008

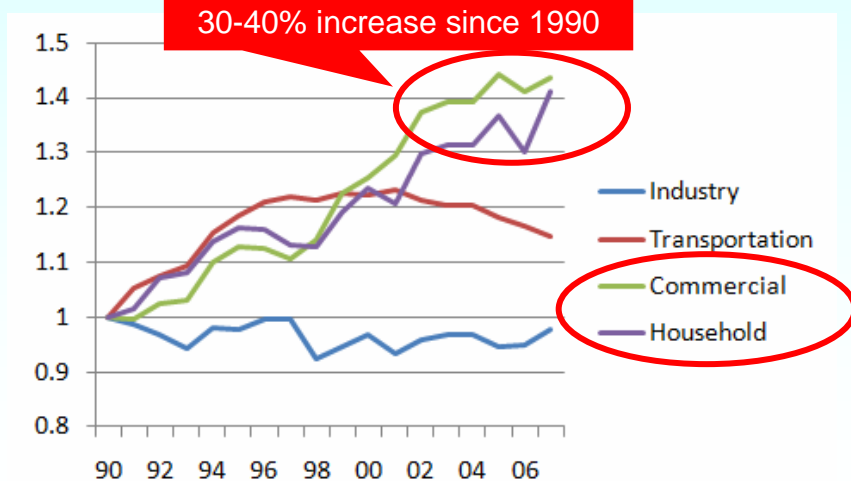
The Hatoyama Initiative announced in the 64<sup>th</sup> general assembly of UN in Sep. 2009

### Japanese target for CO<sub>2</sub> reduction

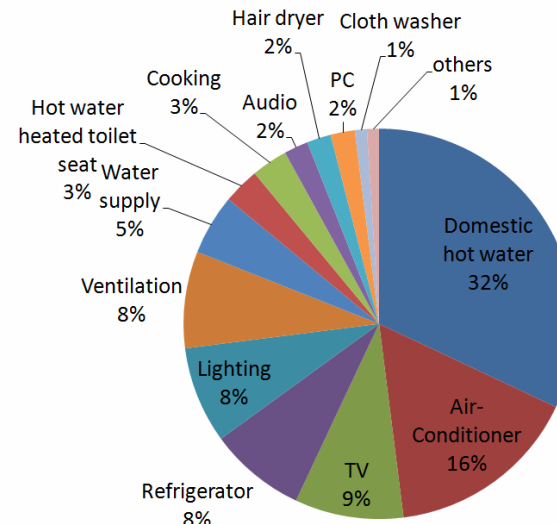
60-80% reduction by 2050 compared with 2009  
(25% reduction by 2020 compared with 1990)

### Present situation in Japan

- Increase of CO<sub>2</sub> emission from "Commercial" and "Household" sectors by 30-40% since 1990
- As for the "Household" sector, energy for domestic hot water and space heating/cooling accounts for a half of the total energy consumption.



CO<sub>2</sub> emission of sectors in Japan



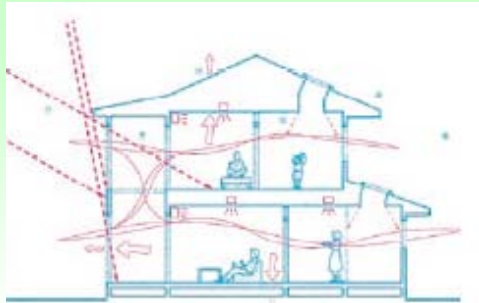
Typical energy consumption of households in mild climate

# Construction of low carbon society

## Its contents

### Practical technologies for improving energy efficiency

50% reduction of primary energy consumption as a target



“Low Energy Housing with Validated Effectiveness” (LEHVE)

### Application technologies of newly developed energy sources to houses and buildings



Test piece of solar hot water system for apartment houses



Capacitor as battery

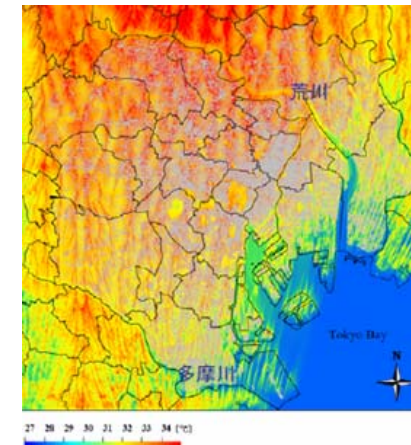
### Deepening practical and effective energy-saving technologies for houses and buildings

- Best mix of energy-saving technologies and newly developed energy sources
- Validation and improvement of actual performance of energy performance

### District or City scale countermeasures for CO<sub>2</sub> reduction

### Developing perspective and scenario toward building low carbon city

- What is truly effective technologies?
- How can they be combined?
- Is the combination cost effective enough?



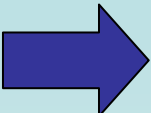
Simulations of heat island in Tokyo  
By the computational analyzing method, which was developed by BRI  
(Temperature distribution on the level of 10 m in Tokyo's ward area at 14:00 on 31 July 2005)

# Long life housing

The Act for Long life and good housing was enforced in 2008.

## Changes in social and economic situations

- Poor enjoyment of quality life even in mature society
- Increase in social welfare cost, forward aging society
- Serious Waste Problem and Global Environmental Problem

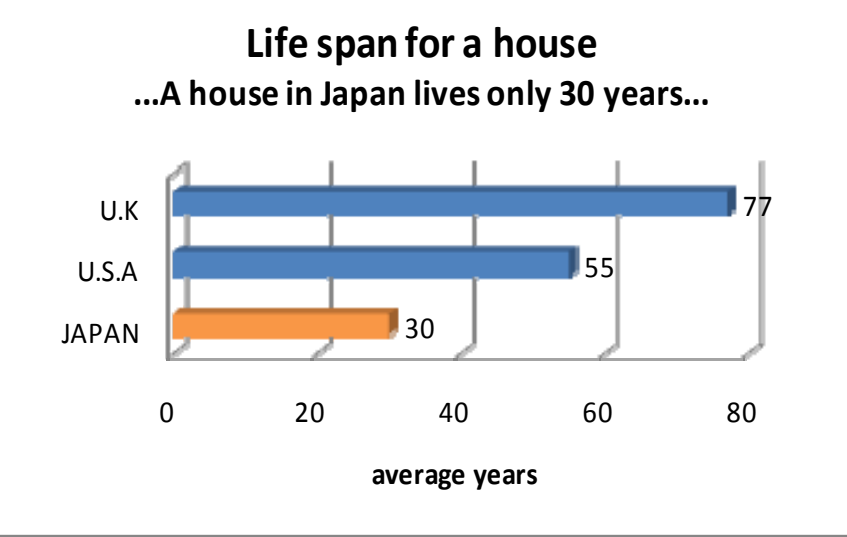
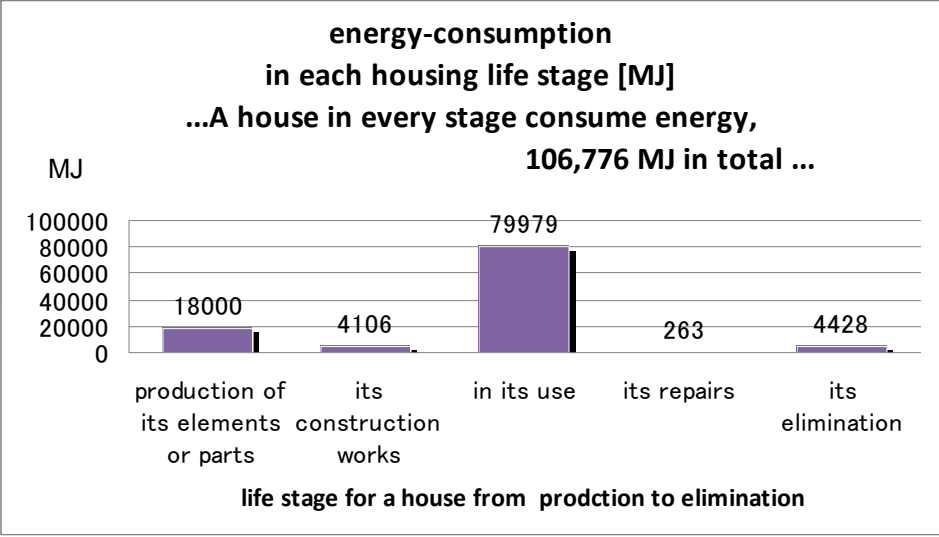


Switch of sense of values, from consumption-oriented to **stock-minded** is urgently required.



- To enrich good housing stock, we must establish good system for **construction, maintenance, distribution and fund-raising** for houses.

**Realization of Longer use of houses**

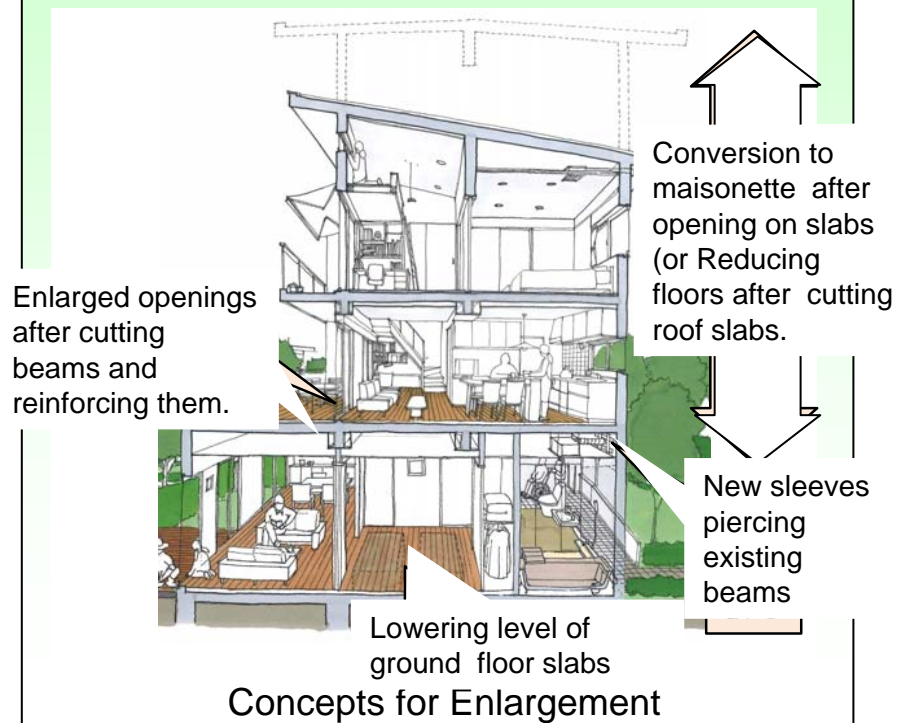


# Long life housing

## Its Contents

### Renewal and Revitalizing housing stock

- Space expansion technology
- Concrete covering measurement technology
- Renewal technology for equipment and plumbing, etc.



### Quality control and maintenance method for materials and elements

- Simple and plain Information System on parts or elements.
- Technology for measurement of deterioration and repairing of products and materials, etc.



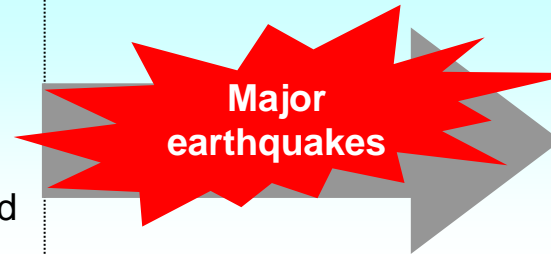
### Business model to facilitate secondhand houses' distribution.

- Proposal on business models for secondhand houses' distribution.
- Evaluation on second houses' performance after their remodeling works, by building contractors.
- Such evaluated values is useful for financial institutions at their financing. etc.

# Safety for super high-rise buildings

## Changes in social and economic situations

- Tower styled high-rise condominiums become popular in all over Japan.
- Several buildings standing in a block become also popular.
- Such buildings are affected by long-period seismic ground motion.



- Minimizing social and economic loss and negative influence after the earthquakes is required.

## Its contents

### Advanced safety measures

- Setup of long period seismic ground motion for designing.
- Development of safety technologies for super high-rise buildings
- Development of evacuation technologies for super high-rise buildings



Testing device for simulating long-periodic seismic waves

### Less-impaired operation and quick recovery after the earthquakes

- Proposal on performance standards for buildings, taken into consideration of repair cost and term after the earthquakes.
- Study on minimum plumbing and electric equipment for water supply and drainage services



# note: Framework of R&D themes in BRI

In April, 2001, Building Research Institute made a start **as an Incorporated Administrative Agency**.

Each Agency builds up their activities on his **Mid-term Plan (5-Years)**, under the Mid-term Objectives oriented by his related Ministers, and does his best to achieve both Priority Themes and Fundamental Themes, specified in the Mid-term Plan.

Now we are in the fourth year **in the Second Mid-Term (2006-2010)**.

Four (4) the Second Mid-terms' Objectives oriented by the Minister (MLIT)

- 1) To achieve high quality of society and living
- 2) To achieve society and living feasible for sustainable developments
- 3) To promote restructuring of buildings and cities in conformity with social changes
- 4) To support both rational building production system and reasonable consumers' choice of housing with employment of Information technologies or their devices

We have eighty-four (84) R & D themes (as of Oct. 2009);

## Sixteen (16) Priority Themes

characterized quick responsible ones **for social and citizens' needs**.

And BRI gives priority and assigns our resources, **corresponding to the Objectives**.

These titles are specified in the Second Mid-Term Plan.

## Sixty-eight (68) Basic Themes

### Basic/Leading Themes

Studies to clarify unknown mechanisms

### Seeding Themes

Studies to develop further ones