

An aerial photograph of a dense urban landscape, likely Tokyo, Japan, during the "blue hour" of dusk. The sky is a deep, dark blue, and the city's buildings are illuminated with warm, golden light from the setting sun. The architecture is a mix of modern high-rises and older, more compact structures. The overall scene conveys a sense of a vibrant, developed city.

Sustainable Real Estate Investment in Japan

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'Sustainability something'
is a key concept of the national policy
which is, in principle, supported by most of citizens in Japan

For example, Hatoyama's Statement
in UN Summit on climate change:

*It is my view that Japan should
positively commit itself to setting a
long-term reduction target. For its
mid-term goal, Japan will aim to
reduce its emissions by 25% by 2020,
if compared to the 1990 level,
consistent with what the science calls
for in order to halt global warming.*

**Comment by Richard Black, BBC
environment correspondent**

Mr Hatoyama's target puts Japan alongside the EU in
pledging substantial greenhouse gas emissions by
2020. Japan's plan is conditional on achieving a deal at the
UN summit in December, so it presents an additional
"carrot" to negotiators; the new Japanese leadership has
not spelled out what will happen if a deal is not reached.
The ambitious target amounts to an emissions cut of
about one-third from current levels in just 11 years, in a
country that already uses energy efficiently. The new
government now has some serious thinking to do about
how to turn rhetoric into reality.

Then? Does enthusiasm for sustainability generate something in the property market?

AGENDA OF PRESENTATION

1. Initiatives by developers in large size projects
2. Available technologies for Sustainable Real Estate Investment
3. Emerging initiatives that could enhance RPI in Japan
4. What are constrains on diffusion of Sustainable Real Estate Investment in Japan?
5. Possible future initiatives

1. Initiatives by developers in large size projects

Otemachi Marunouchi Yurakucho (OMY) Environmental Vision

Initiative by Mori-trust for biodiversity conservation

Otemachi Marunouchi Yurakucho (OMY) Environmental vision

Foresight toward coming 1000 years

Land plot formation has formed 400 years ago

Need of holistic town management to assure
economic/social/environmental sustainability

The OMY Environmental vision

1. Respect for historical context

Plan for the next 1,000 years based on the 500-year history

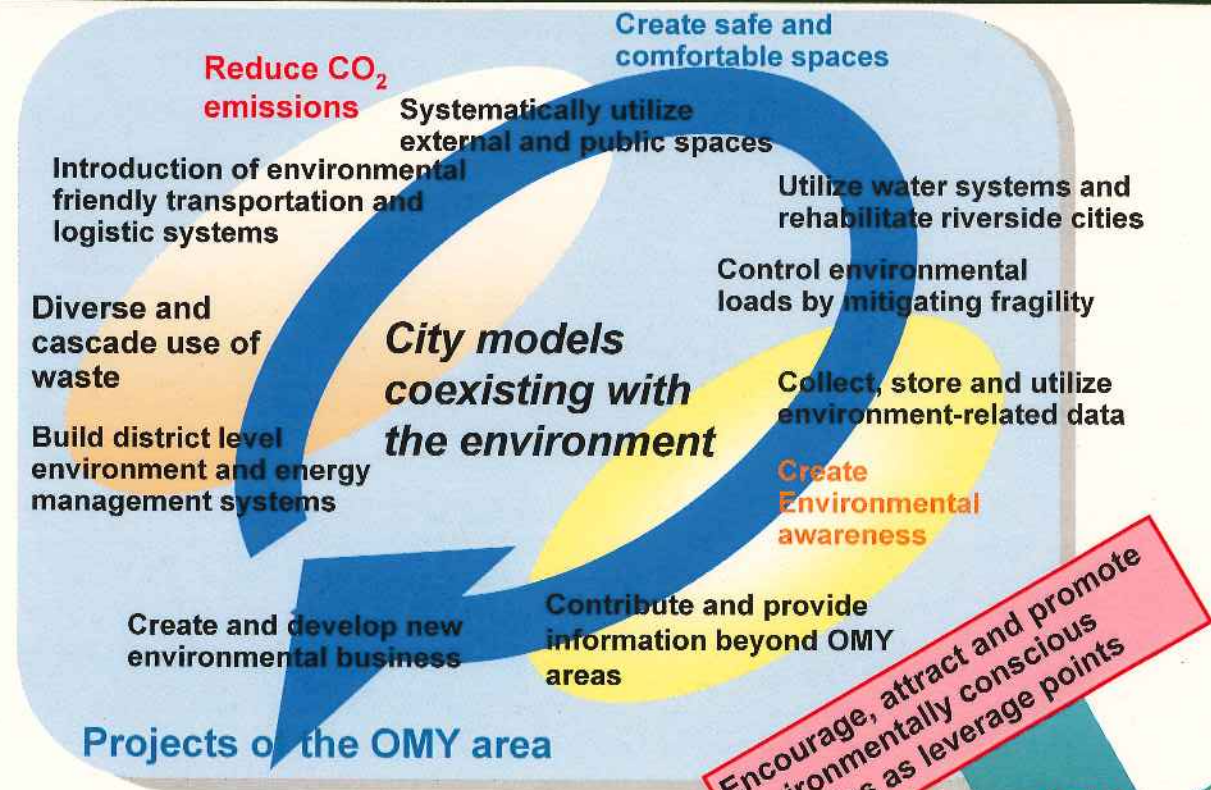
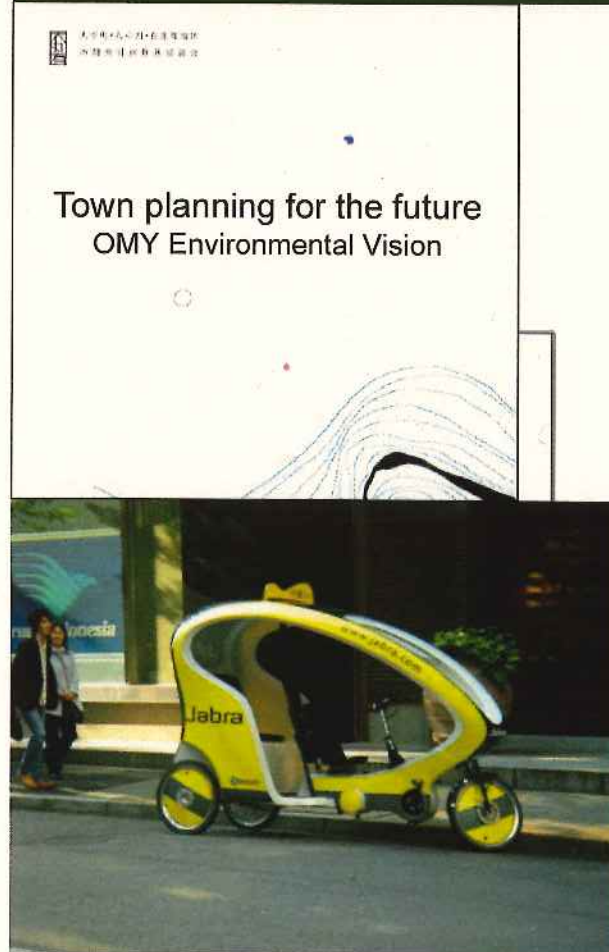


District scale branding for the future

Maturity generated by humanity

Leverage points of environmental symbiosis

Infrastructure for supporting sustainable activities



Encourage, attract and promote environmentally conscious activities as leverage points

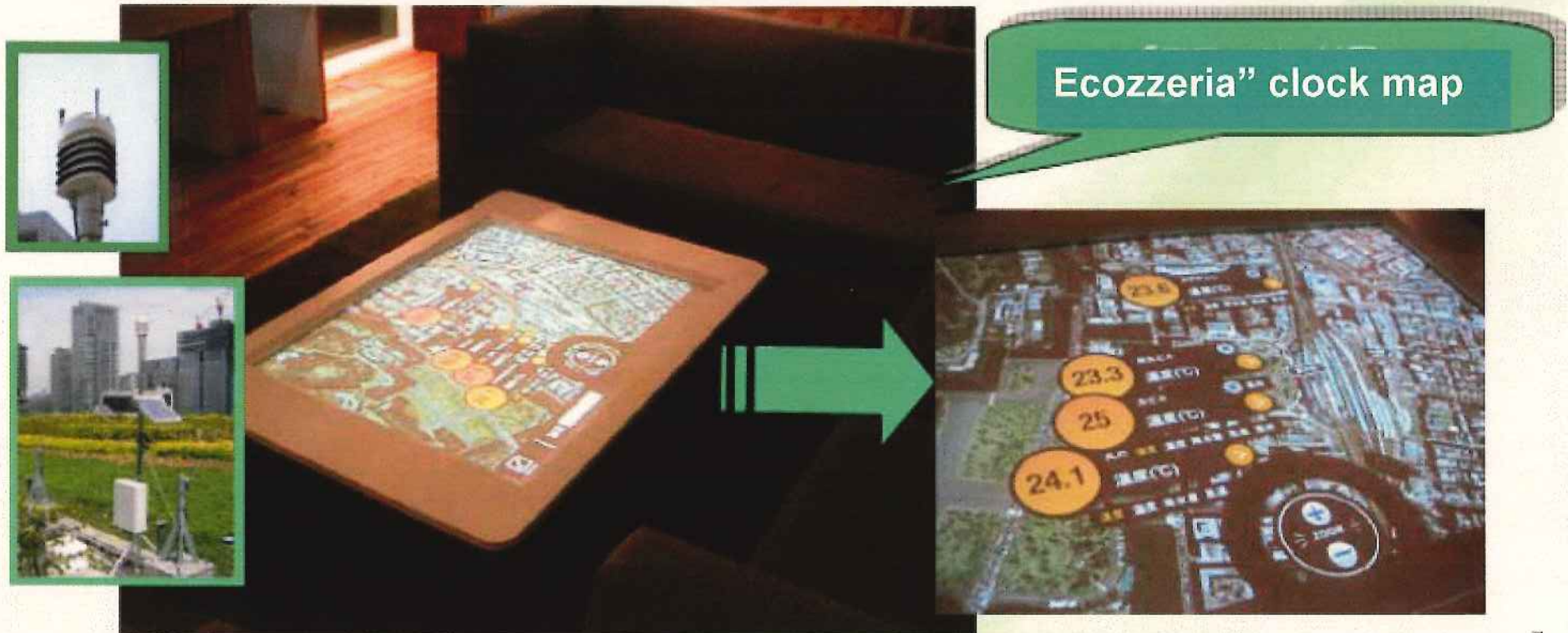
Toward Tokyo, Japan and the world

<http://www.pref.kanagawa.jp/osirase/kendoso-mu/kankyou-kyousei/twin/partner/forum/siryou12>

The OMY Environmental vision

Community involvement by the provision of information

<http://www.pref.kanagawa.jp/osirase/kendosomu/kankyou-kyousei/twin/partner/forum/siryou12>
http://www2.ir3s.u-tokyo.ac.jp/esf/images/activity/symposium_02_nagashima.pdf



Environment conscious design in Marunouchi Park Building

Cool roofs (low VOC type)

Adoption of super-efficient lighting systems

Considerably reduce energy consumption (by over 30%) as compared with existing appliances by adopting the super efficient lighting appliances by using reflective boards and improved paints.

Water circulation systems

Store rainwater in the tank on the middle floor and use the stored rainwater as part of vegetation of the courtyard, landscaping facilities and water-retaining pavement.

DHC facilities with high energy-saving performance

Considerably reduce CO₂ emissions from heat sources (by little less than 30%) by introducing such latest energy-saving technology as inverter turbo freezers and ice thermal storage systems.



Photovoltaic (PV) generation (on the roof)

Maximum output: 60kW or so

Airflow window system

Floors covered: standard and office floors

Glass composition:

low-e pair glass for outside
+ float glass for inside

Blinds: controlled by a direct illumination detector for blind control

The thermal transmittance and sunlight blocking performance of the outer wall will be improved and a high PAL value will be achieved.

Measures against heat island effects

Trees are planted and steps to cover are taken mainly in the space of Mitsubishi Ichigokan (approx. 1,120 m²)

Rooftop Greening: approx. 585 m²

Wall Surface Greening: approx. 450 m²

Ground Greening: approx. 1,450m² (including the periphery)

* Water-retaining pavement

Water-retaining pavement is adopted for part of the courtyard, and on fine days in summer, water is supplied from the feed-water pipe installed beneath the pavement. **The adoption of rainwater-using water-retaining pavement of this scale is the first in the private sector.**

Initiative by Mori-trust for biodiversity conservation

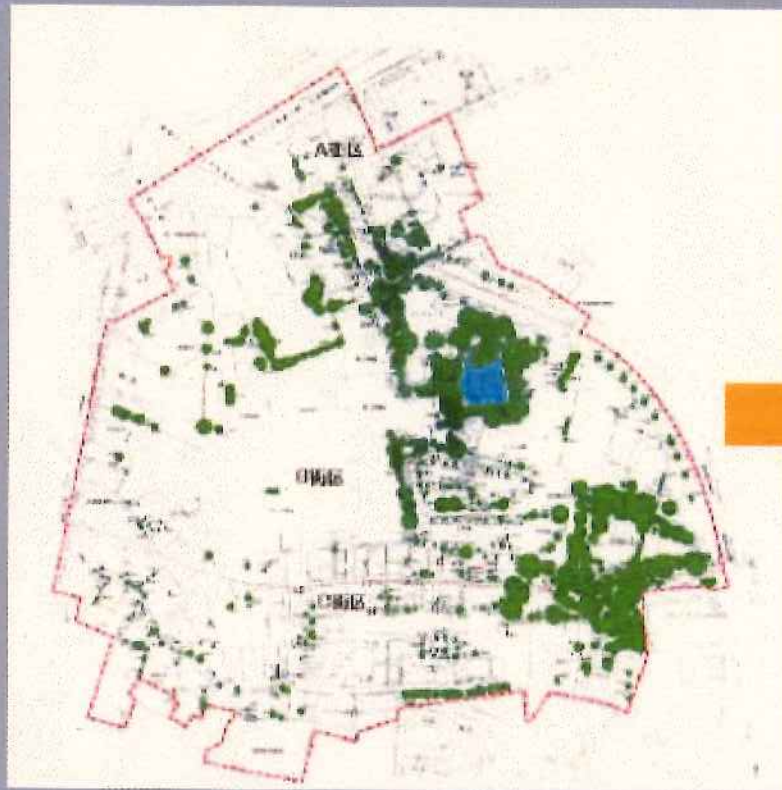


Source: Japan Environmental Technology Promotion Association, a specified nonprofit activities corporation.

<http://www.jetpa.jp/jetpa/2008/10/post-1491.html>

Initiative by Mori-trust for biodiversity conservation

Roppongi Hills Buildings: new green tracts about 1 ha having about 68,000 trees in total created.



Before:
Green tracts: 16,500m²

After:
Green tracts: approx. 26,000m²

Source: "From Greening to Biodiversity: Projects of Mori-trust" paper published on November 1, 2008 by Mr. Hiroki Yamaguchi of Mori-trust. http://www.foejapan.org/forest/pdf/081101mori_building.pdf

Initiative by Mori-trust for biodiversity conservation



- Commitment in the CBD COP9 for biodiversity in the leadership declaration in the “Initiative in Business and Biodiversity”
- Formation of sustainable ecological networks that would link individual projects by Mori Trust
- Formulation of a management plan based on the investigation on the present state of the biological environment using habitat assessment method

Source of the figure: “From Greening to Biodiversity: Projects of Mori-trust” paper published on November 1, 2008 by Mr. Hiroki Yamaguchi of Mori -trust. http://www.foejapan.org/forest/pdf/081101mori_building.pdf

2. Available technology for Sustainable Real Estate Investment

Technology could or is expected to make a breakthrough.

- Information embedded buildings
- Environmental Rating – CASBEE

Why are information embedded buildings? Background

For the sustainable management of buildings,
the stakeholders of the building need to access information whenever
and wherever they need it.

However, in many cases,

Data is not collected

or

Data is deleted

or

Data is fragmented

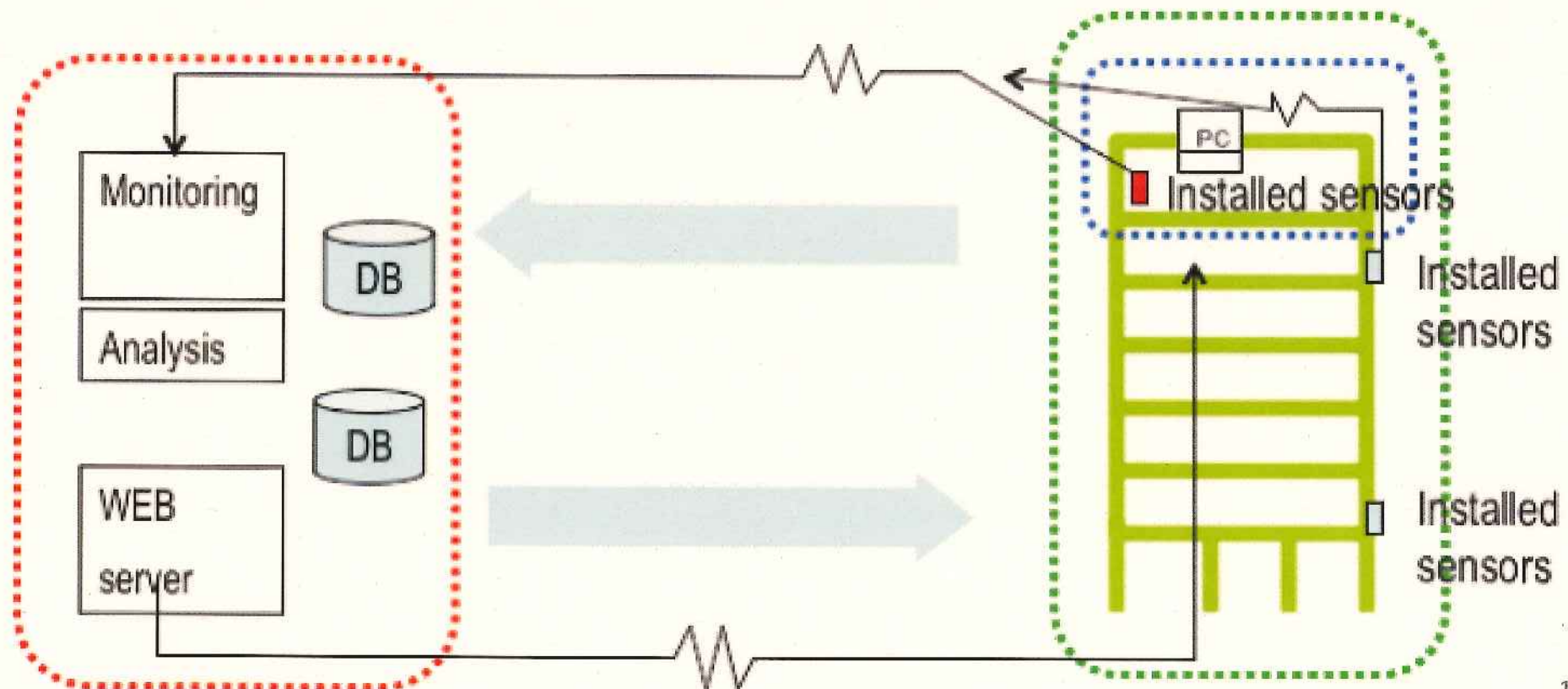
or

Data is protected without any justification

What is information embedded building?

A building that assures stakeholders to ubiquitously acquire building related information whenever and wherever they need.

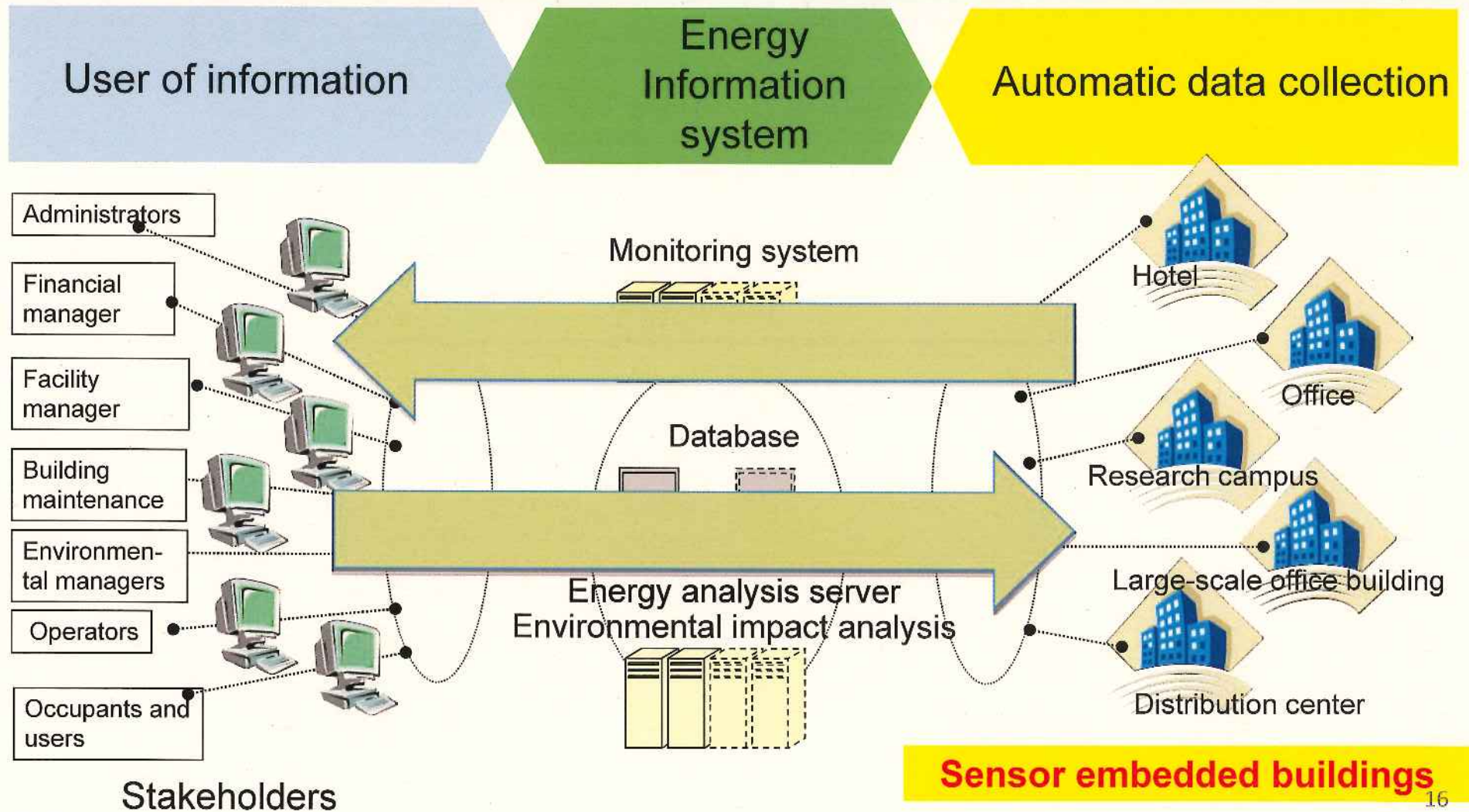
- Technical detail and specification of buildings and their components
- Maintenance record of buildings and their components
- Monitored performance data of building such as data on energy use, indoor air quality etc. (real time based if necessary)

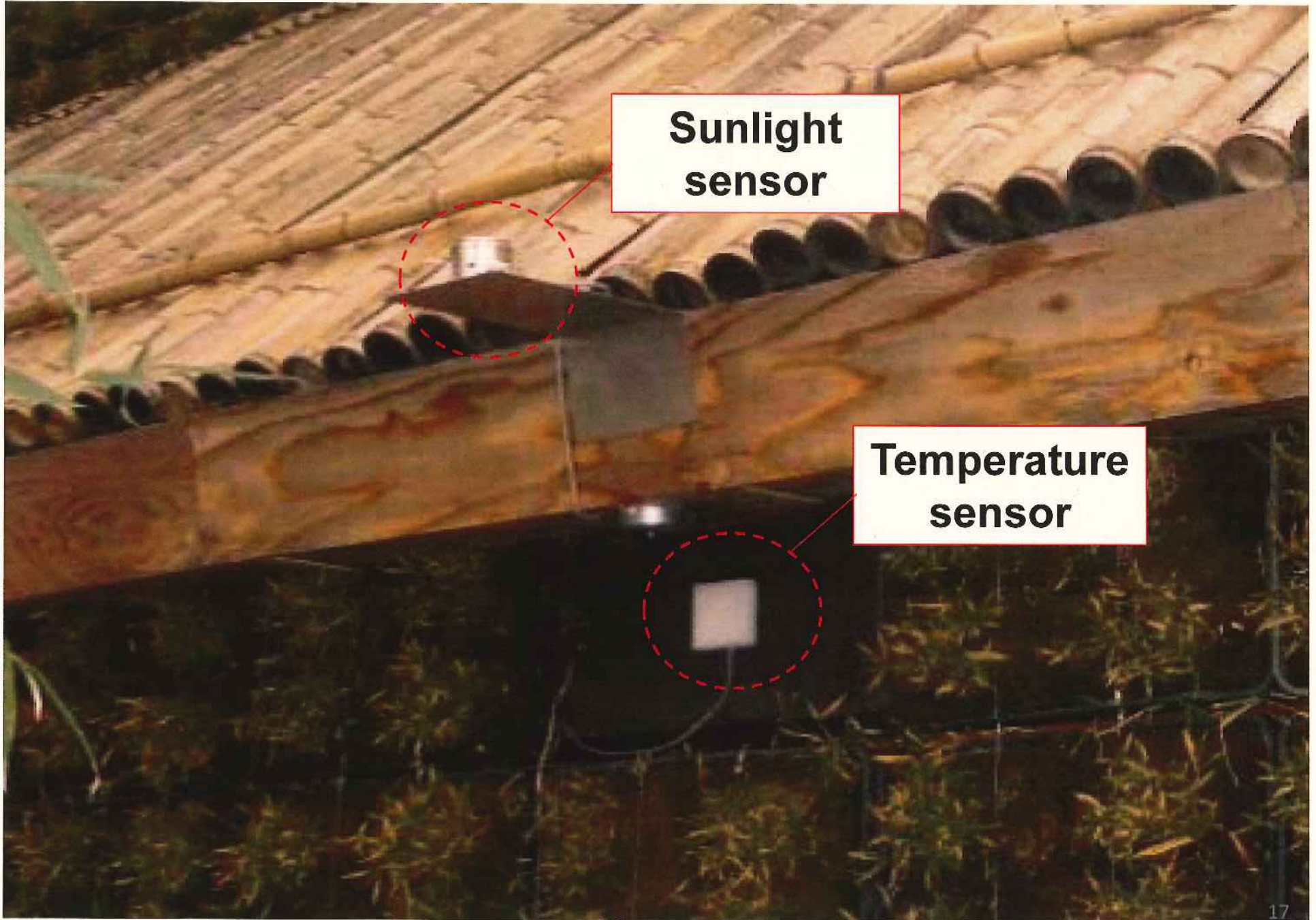


Information embedded building

- is technologically feasible by the utilization and integration of available ubiquitous computing technology.
- can contribute to well-informed decision-making in the energy/life cycle management of buildings.
- enables reality based benchmarking (i.e. bridge the gap between dream in design and reality) .
- enables continual improvement in management by providing a more precise engineering model and data ubiquitously.

ICT based energy monitoring system as feedback tool for continual improvement





**Sunlight
sensor**

**Temperature
sensor**

MR 6 外壁

A temperature sensor is mounted on the wall surface covered with heat insulating materials.

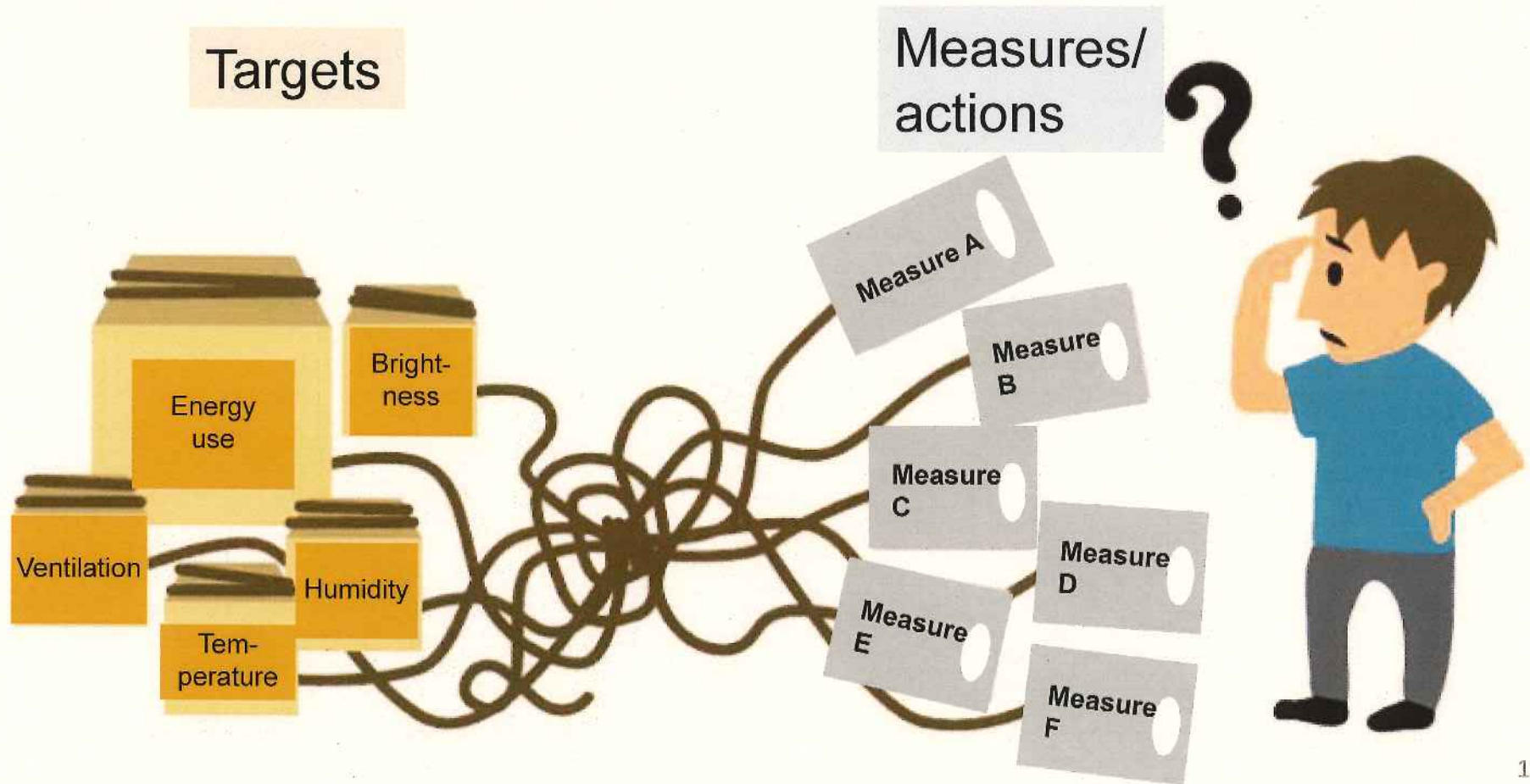
壁面に温度センサーを
設置する。

Temperature sensor

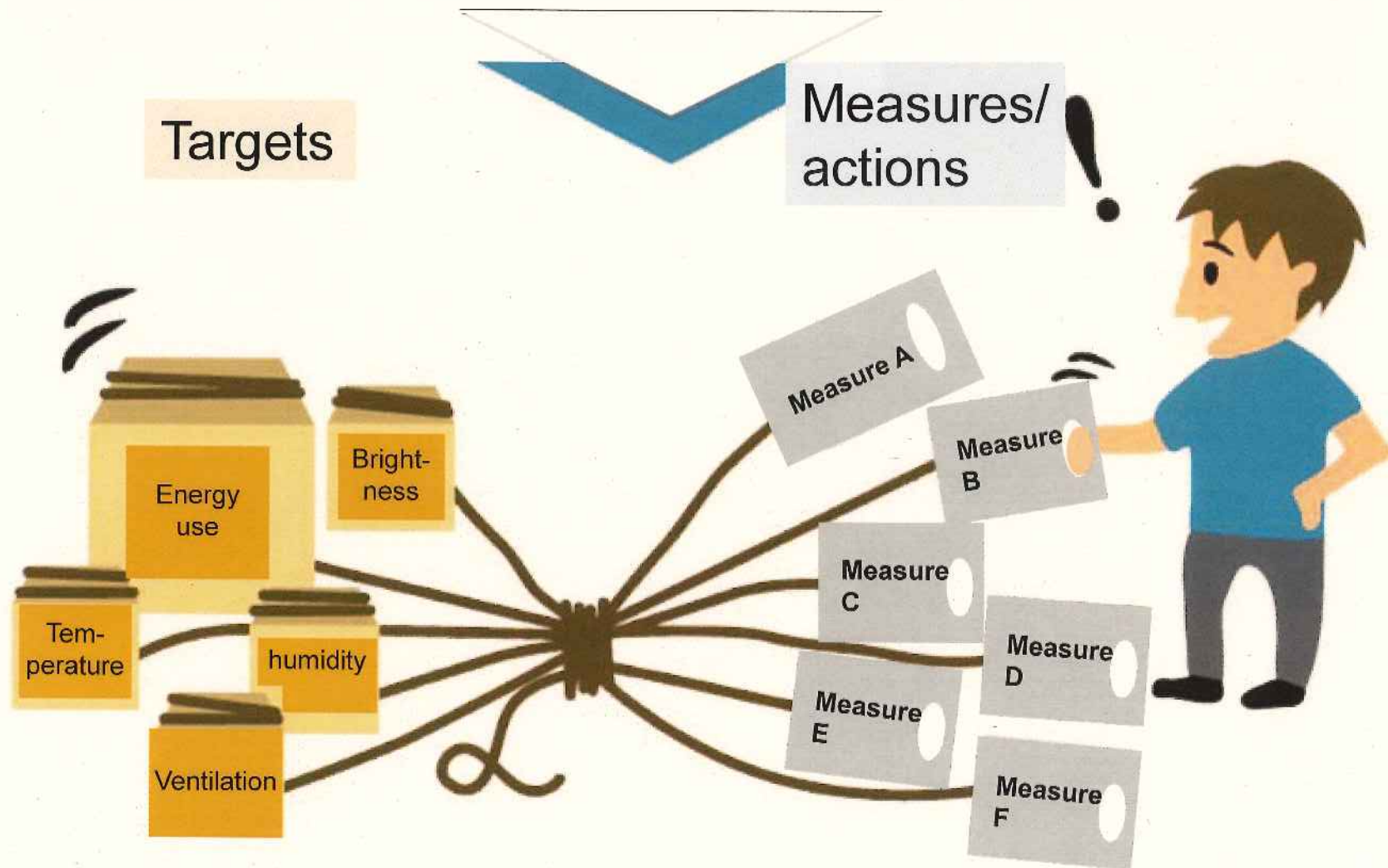
Less informed situation causes entangled and ineffective actions

Difficulty to identify engineering model because of

- complexity composed of various parameters
- uniqueness of individual conditions



Information embedded buildings enable identification of an engineering model that enhances controllability of the building

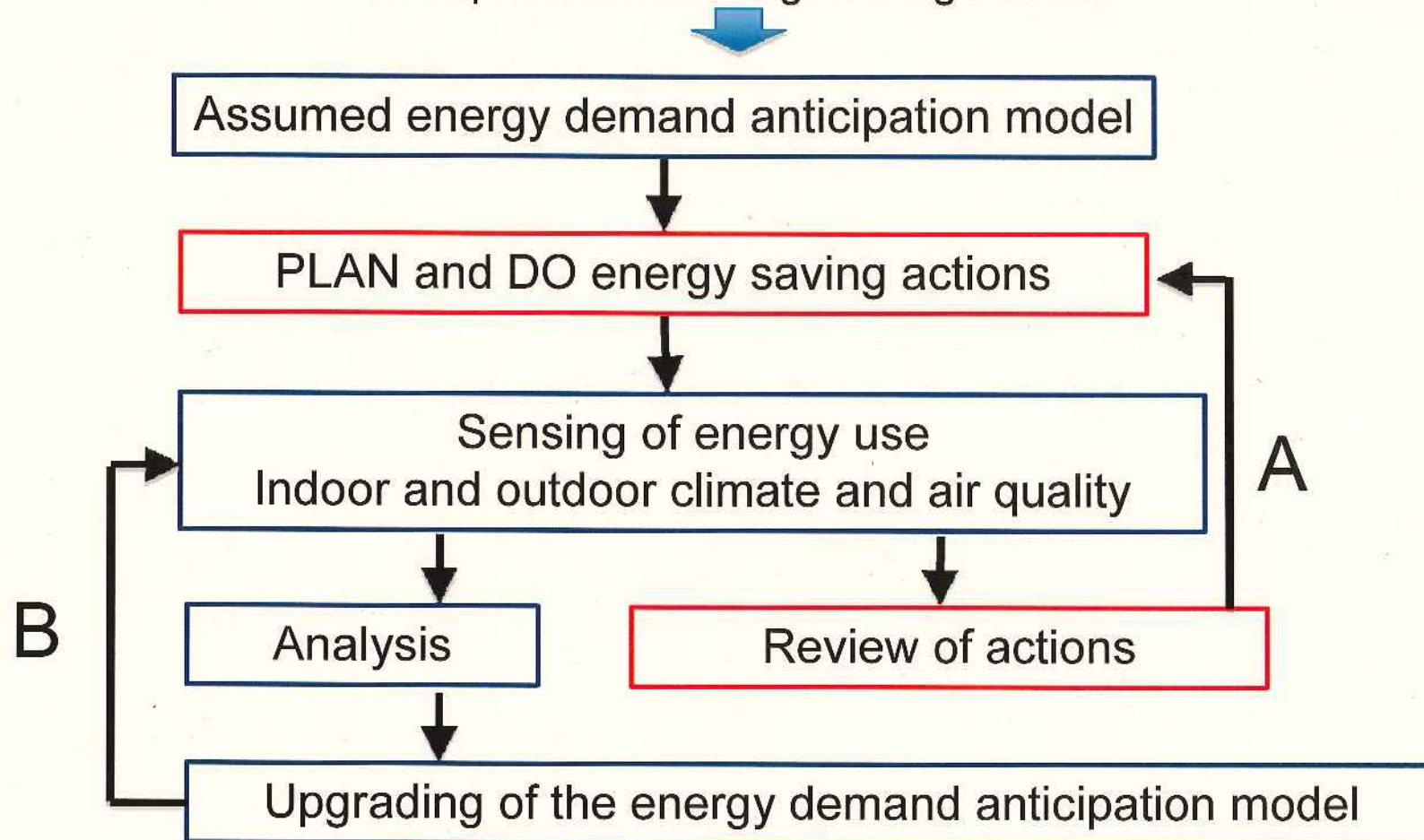


Continual improvement of energy management using an energy monitoring system

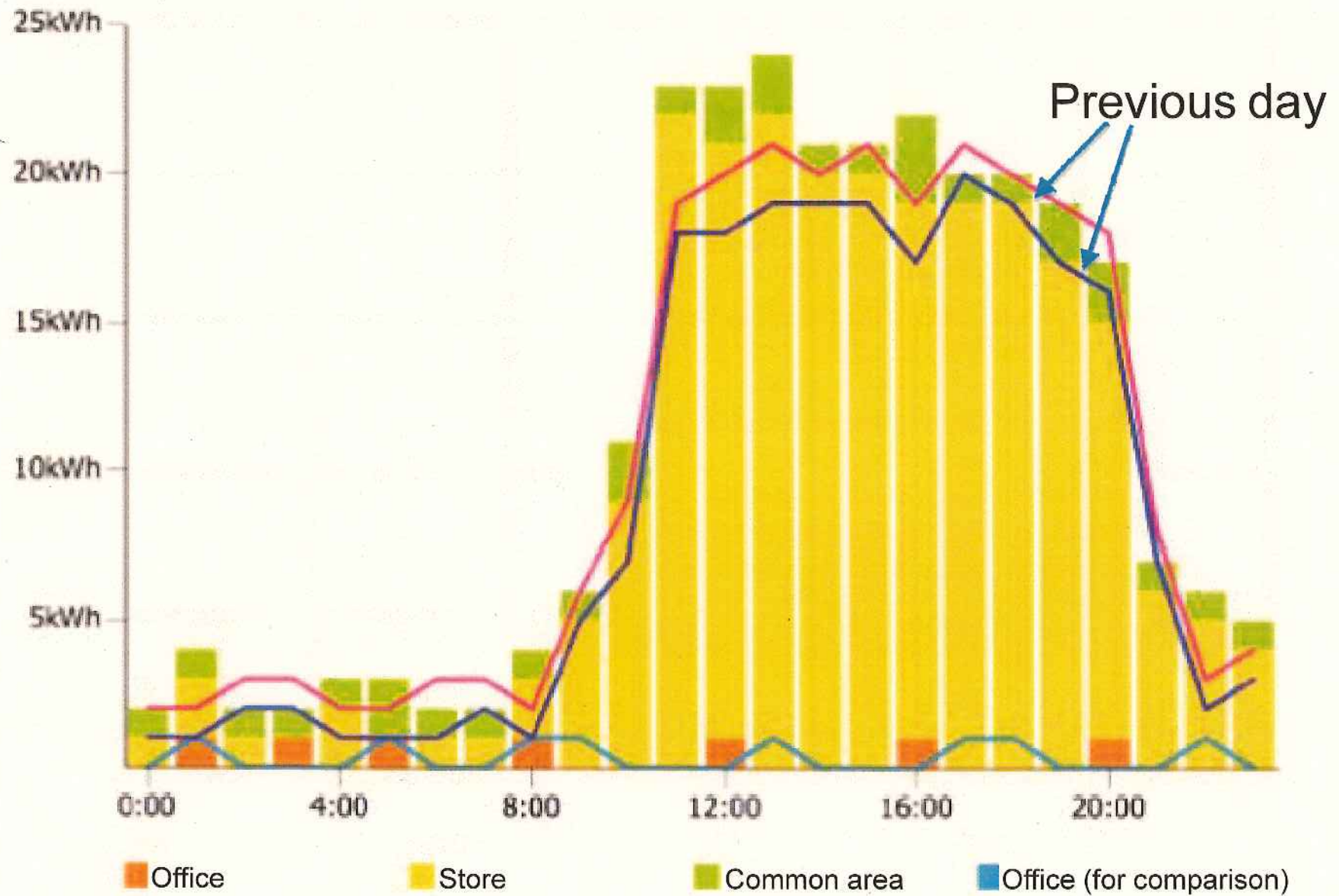
Automated building operation through an **information embedded building**

A. Continual improvement of energy saving actions

B. Improvement of engineering models



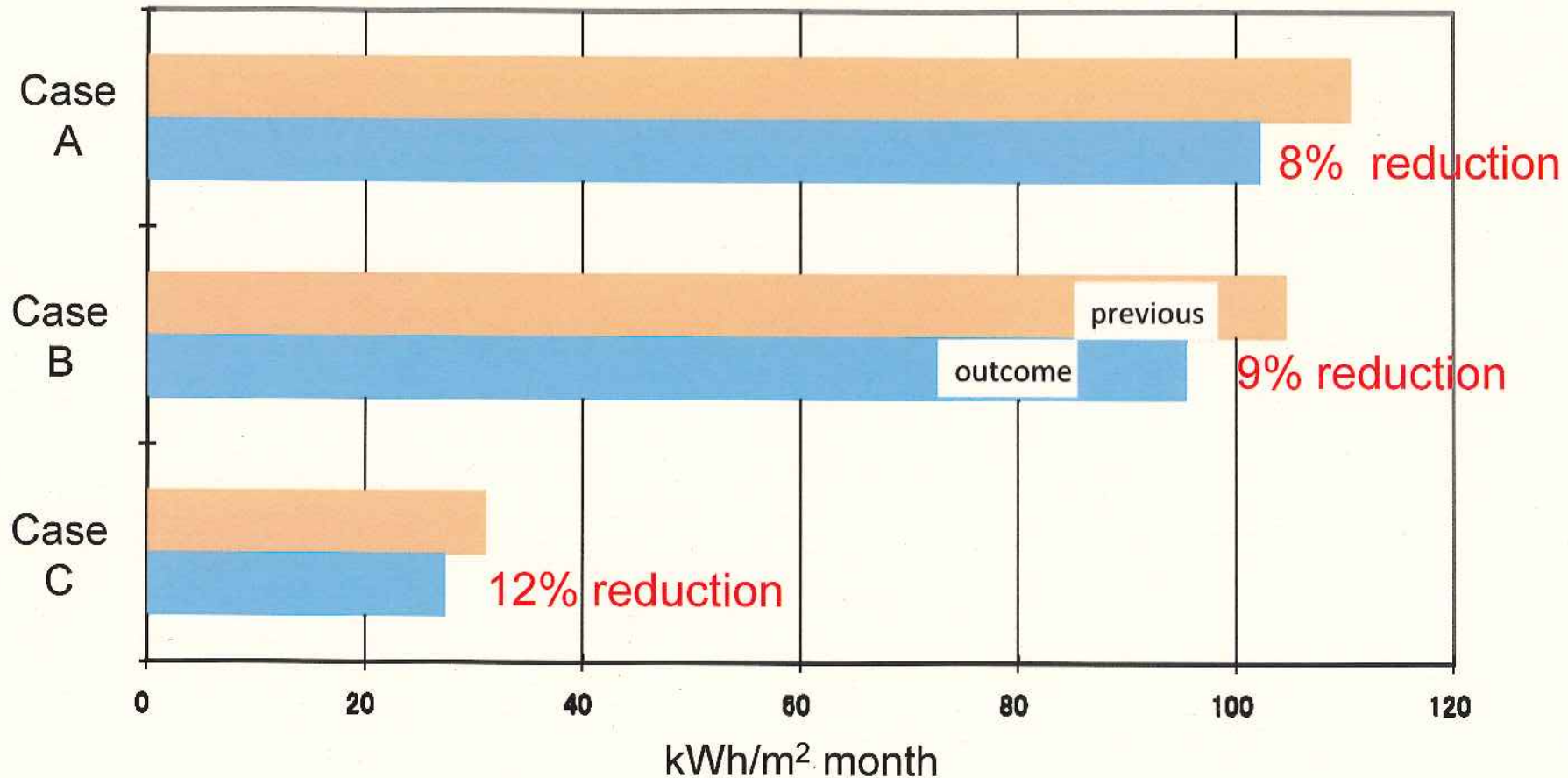
Example of data presentation



Example of improvement by the energy monitoring system

10% electricity use reduction
only by operational improvements

Monthly electricity use



Methods for assessing the environmental performance of buildings

Communication with stakeholders



Assessment of Building Performance

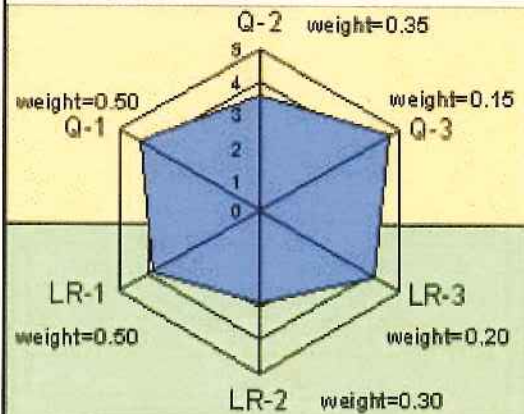


CASBEE

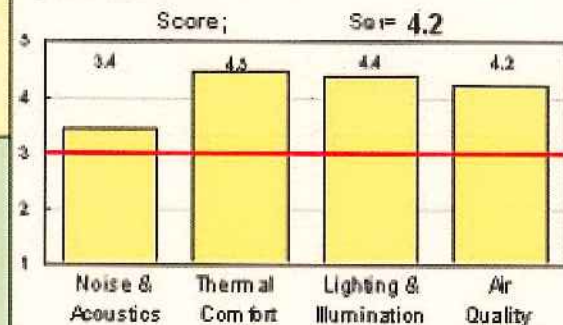
Comprehensive Assessment System for Built Environmental Efficiency

Multi-criteria of environmental performance

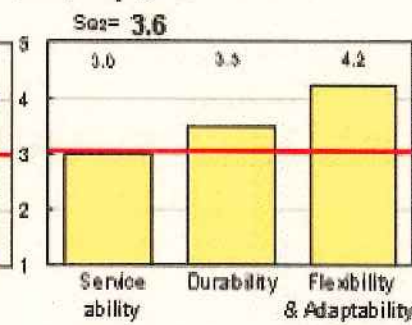
Radar Chart



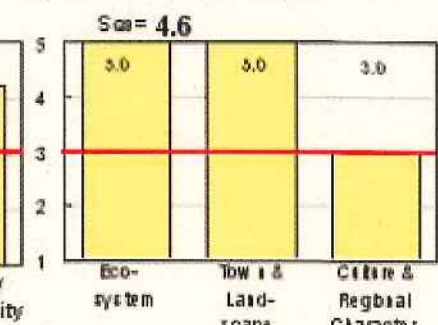
Q-1
Indoor Environment



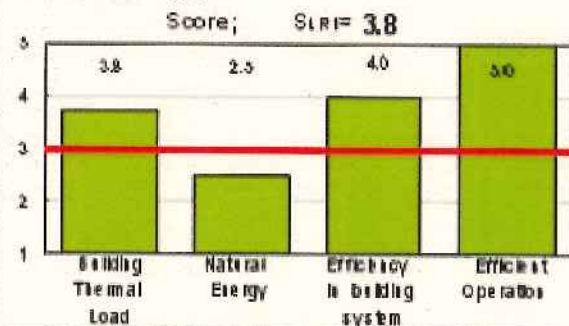
Q-2
Quality of Service



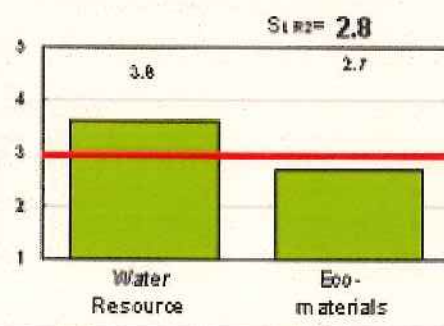
Q-3 Outdoor Environment on Site



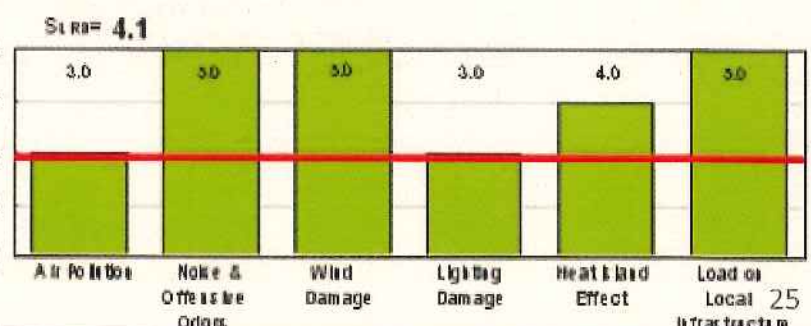
LR-1
Energy



LR-2
Resources and Materials

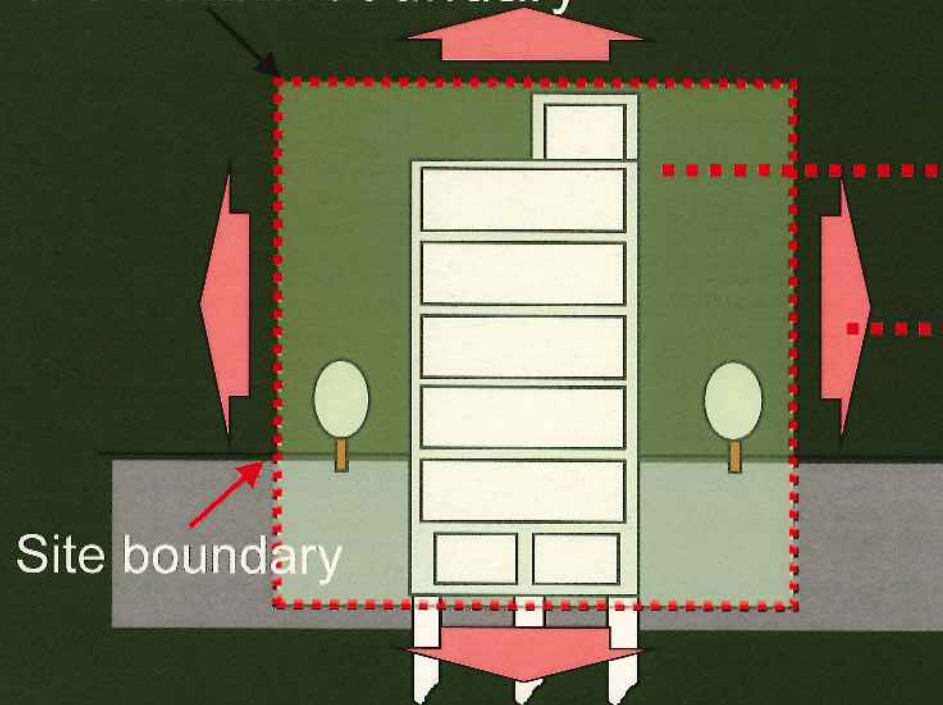


LR-3
Off-site Environment



Example of indicator of overall performance in the CASBEE

Space enclosed by
the virtual boundary



$$\text{BEE} = \frac{\text{Q (Quality)}}{\text{L (Load)}}$$

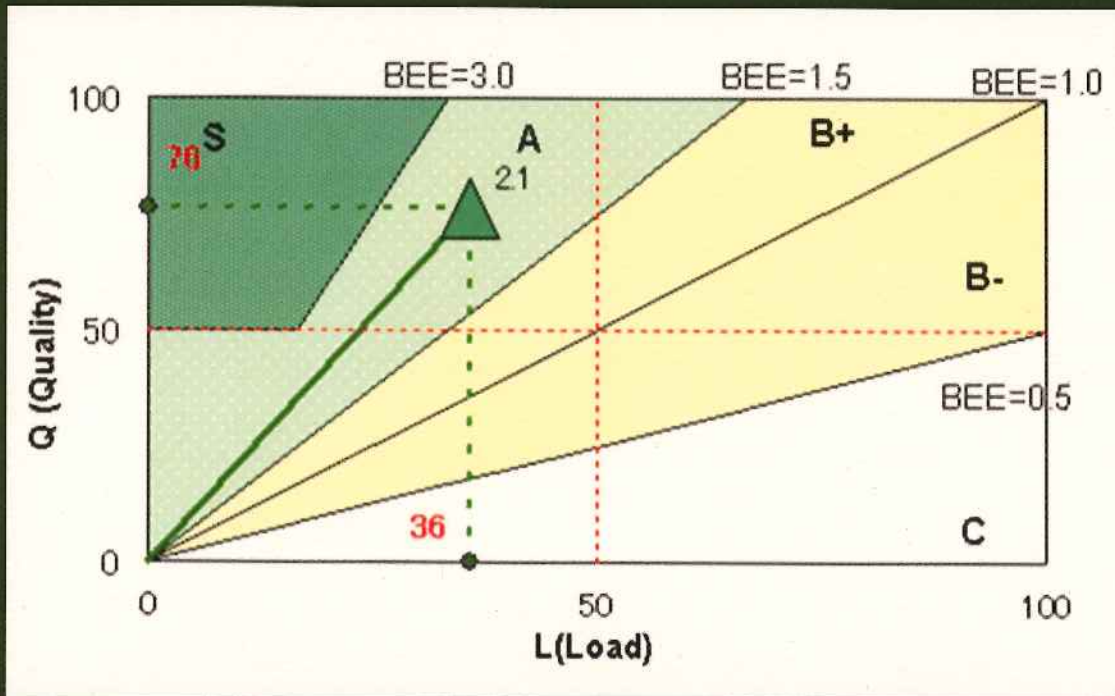
Environmental quality
inside the enclosed
space

Environmental impact
outside the enclosed
space

BEE: criterion for achieving
a higher quality building with
lower environmental loads

Assessment Result Sheet

Labeling based on BEE



$$\begin{aligned} \text{BEE} &= \frac{\text{Quality}}{\text{Load}} \\ &= \frac{(Q_1 + Q_2 + Q_3)}{(L_1 + L_2 + L_3)} \\ &= \frac{76}{36} = 2.1 \end{aligned}$$

3. Emerging initiatives that could enhance RPI in Japan

Member of the research group

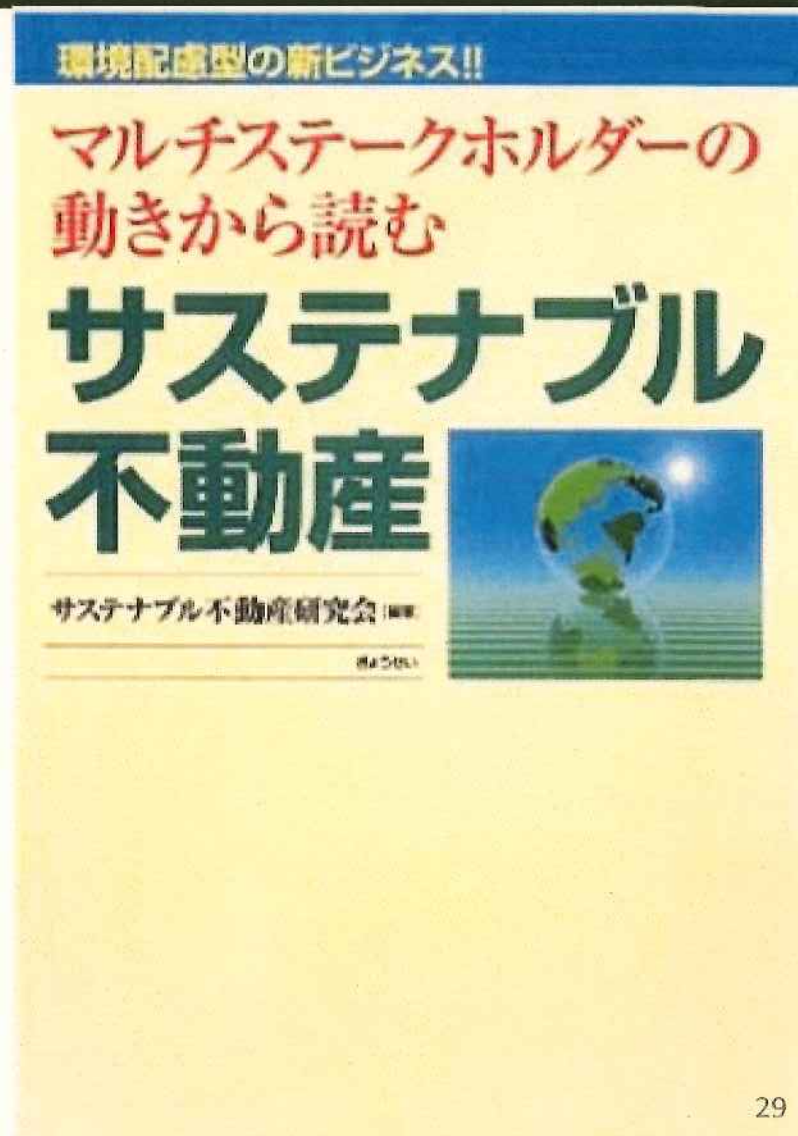
- Professors
- Building engineers
- Government officers
- Local authority officers
- Energy management servicers
- Developers
- Environmental consultants and activists
- Environmental accounting experts
- Commercialization promoters, etc.

Outcome of RPI research group

Chapter 1. Sustainable real estate

Chapter 2. Latest trends of various stakeholders (government projects, Tokyo's projects, Yokohama's projects, projects of the construction industry, projects of financial institutions, developers' projects, NGO's expectations for sustainable real estate, consultants' activities, activities of real estate assessment organizations, activities of overseas systems for assessing the environmental performance of buildings)

Chapter 3. Mechanisms for promoting eco-friendly business



Issues discussed in the RPI research group

- Simplicity/clarity vs. preciseness/uncertainty of environmental performance assessment reporting (bridge the gap between financial institutions and engineers)
- Impact of ecology assessment on business activities and decision making
- Valuation methodology, in other words, possibility of including ignored benefits and potential risks
- Consensus on benefits and cost allocation among stakeholders
- Potential of financial institutions as the starters of changes (changing agent)
- Potential of buying powered companies as the starters of changes (changing agent)

etc.²⁰

Assessment of environmental performance

Conciseness &
comprehensiveness

Accuracy &
preciseness



Non-professional

Professional

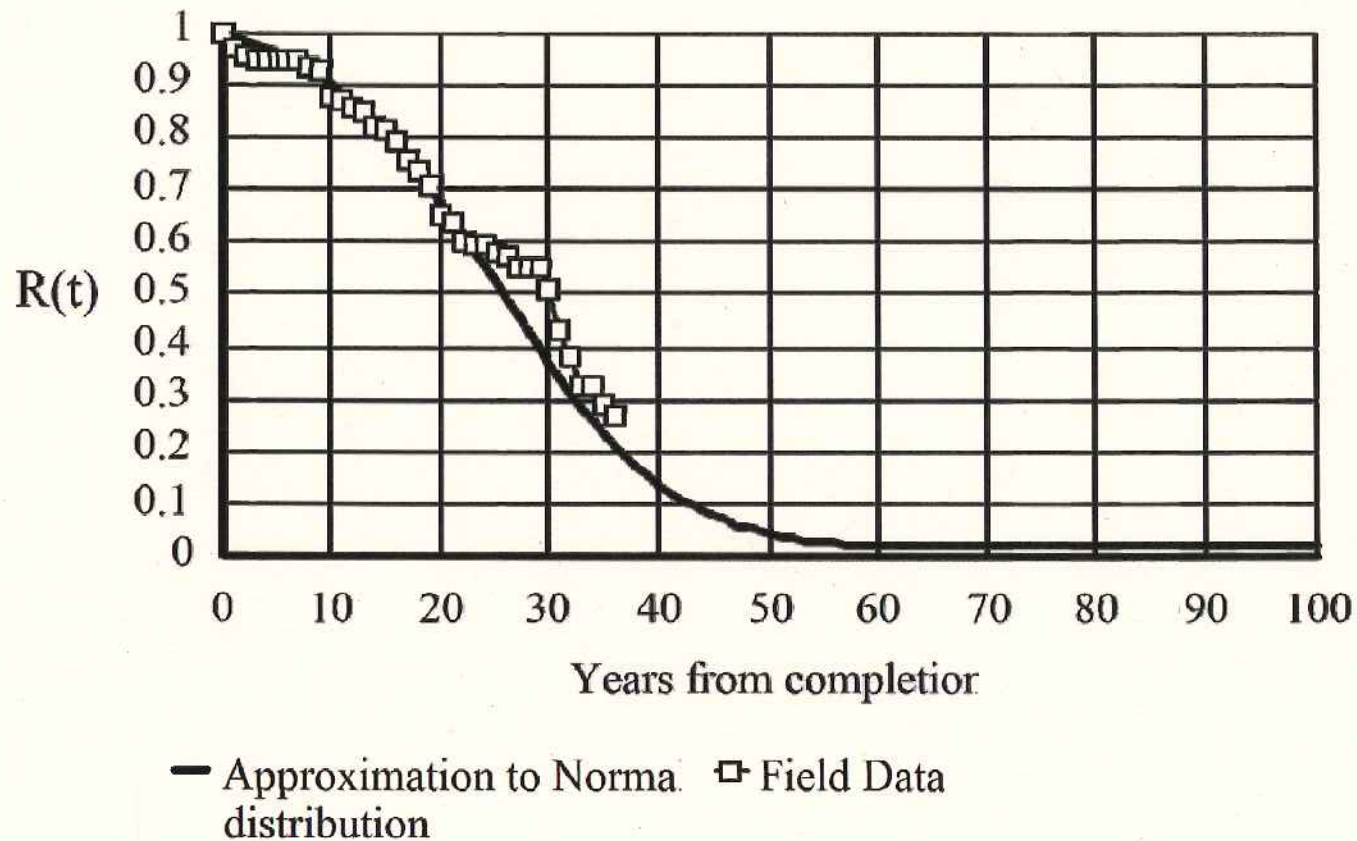
4. What are constrains on the diffusion of Sustainable Real Estate Investment in Japan?

In reality, there exist constrains, including those in the financing industry:

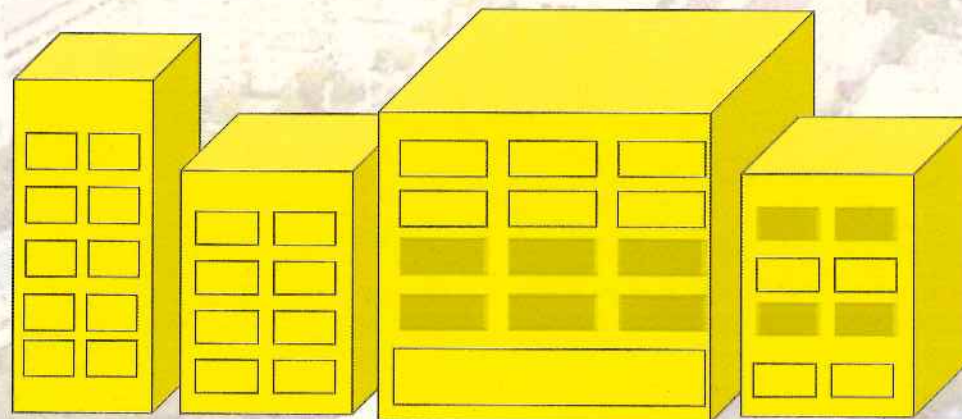
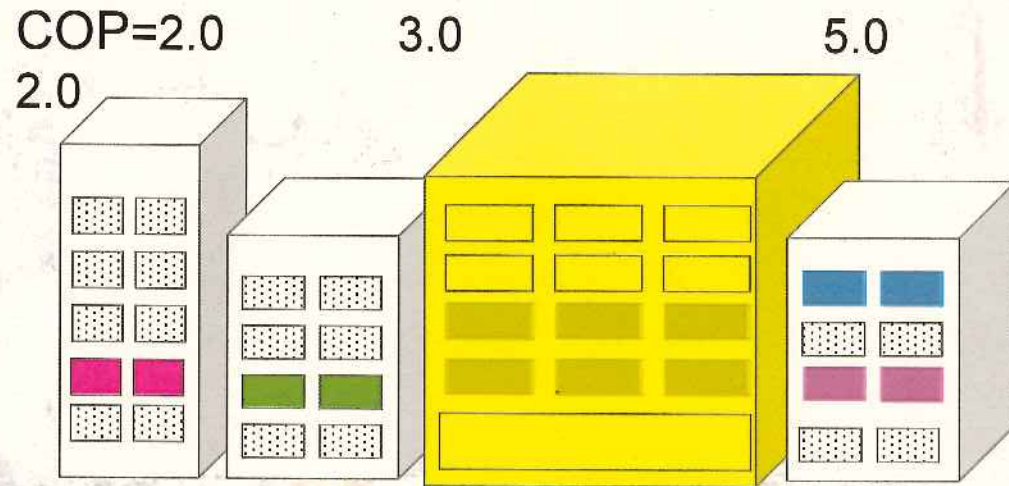
- Dominance of the end of pipe idea
- Traditional belief on 'wealth'
- Keeping to old customs
- Capacity and 'passive' to disclosure
- Limited number of 'green clients' who prefer green buildings
- 'Chicken and egg' trap, i.e., no record data, thus no action

5. Possible future initiatives

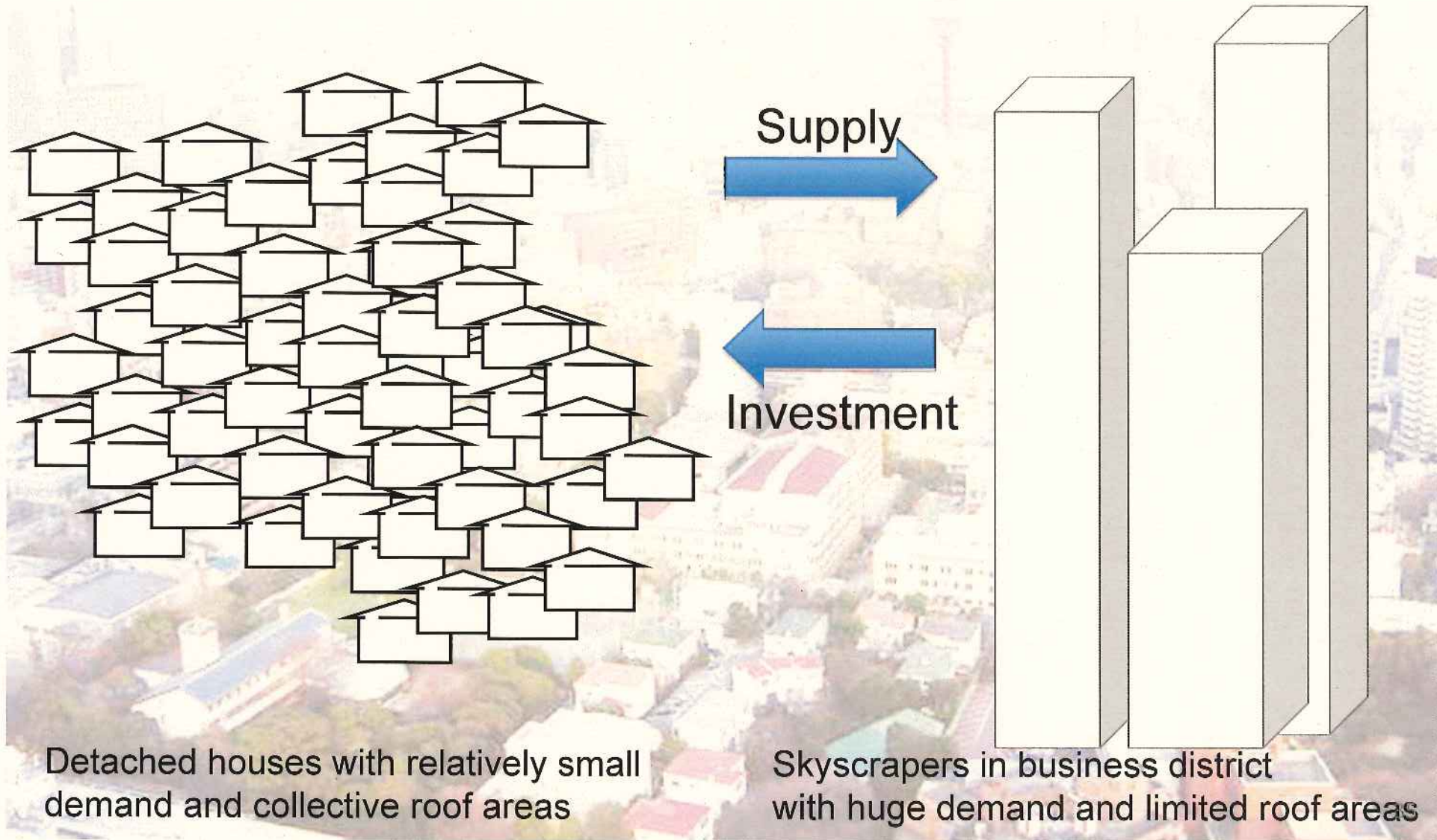
Short life buildings in Japan



Neighborhood energy management for utilizing the most efficient utility



Cross-district partnership for PV utilization between business and residential districts





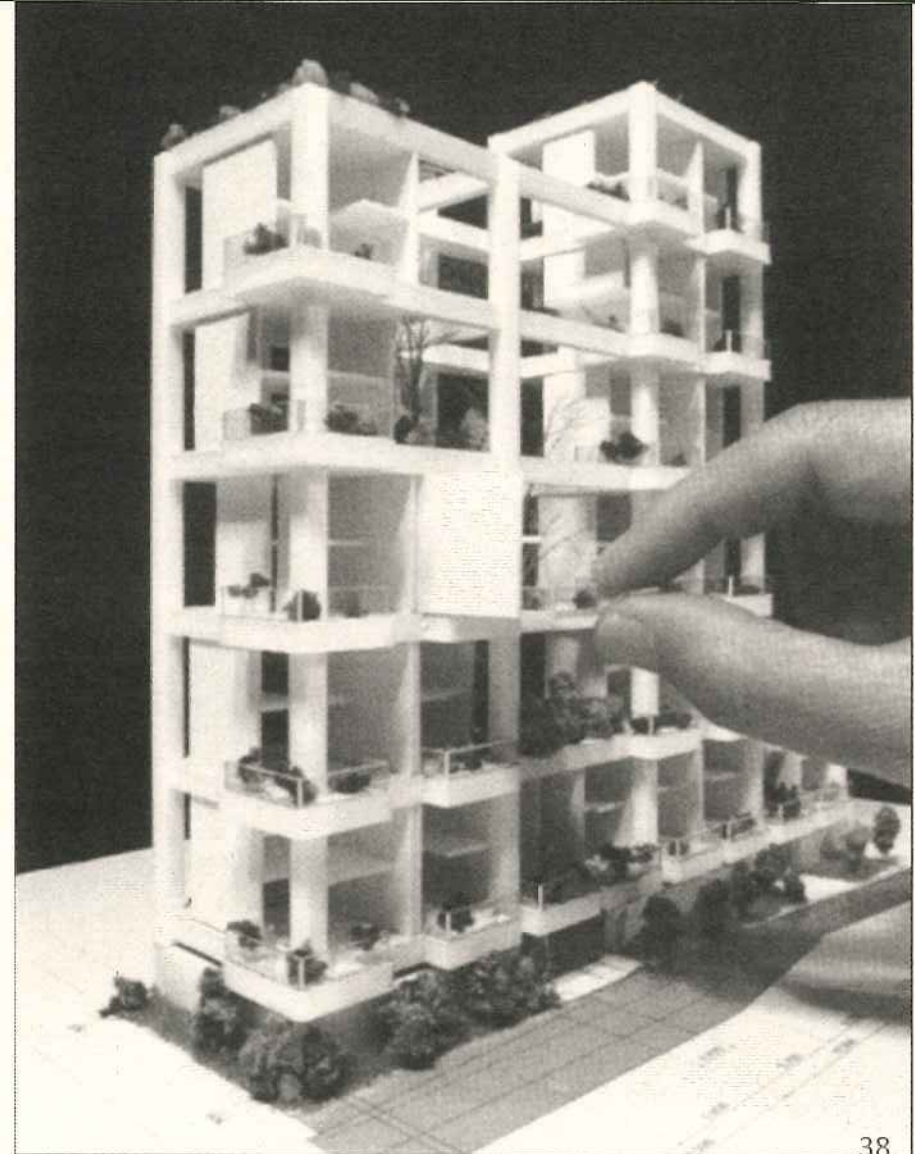
Open building system applicable for retrofit of buildings

Skeleton/Support

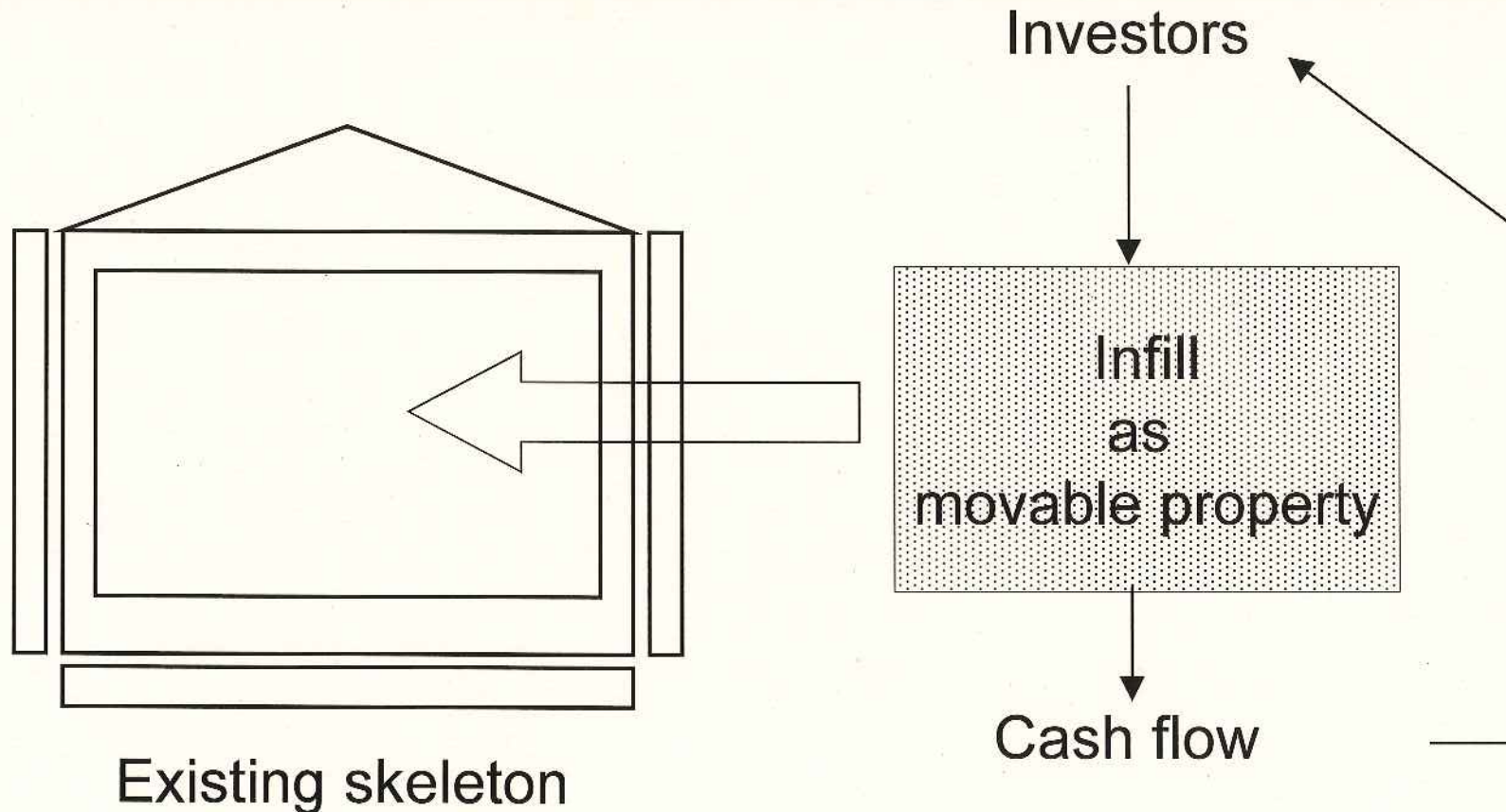
- Use for 100 to 200 years
- Requires continual engineering assessment report based on monitoring

Infill

- Private property exchangeable respecting on ever changing requirements



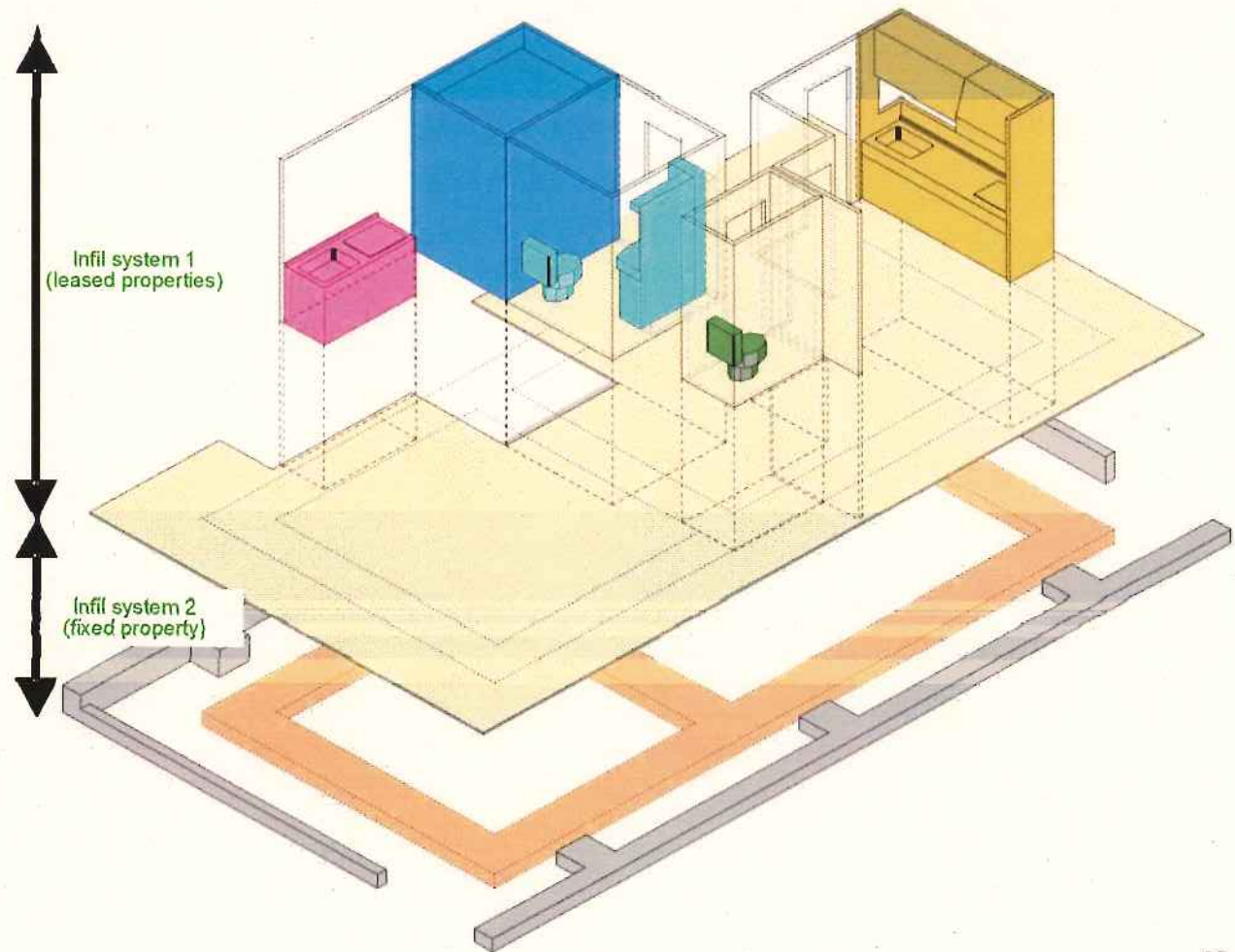
Infill as movable property could be the device
to generate independent cash flow
that is nothing to do with stakeholders to existing
skeleton
(asset based lending, etc.)



Infill as legally registered movable property

Upper system
Movable property

Lower system
Fixed property

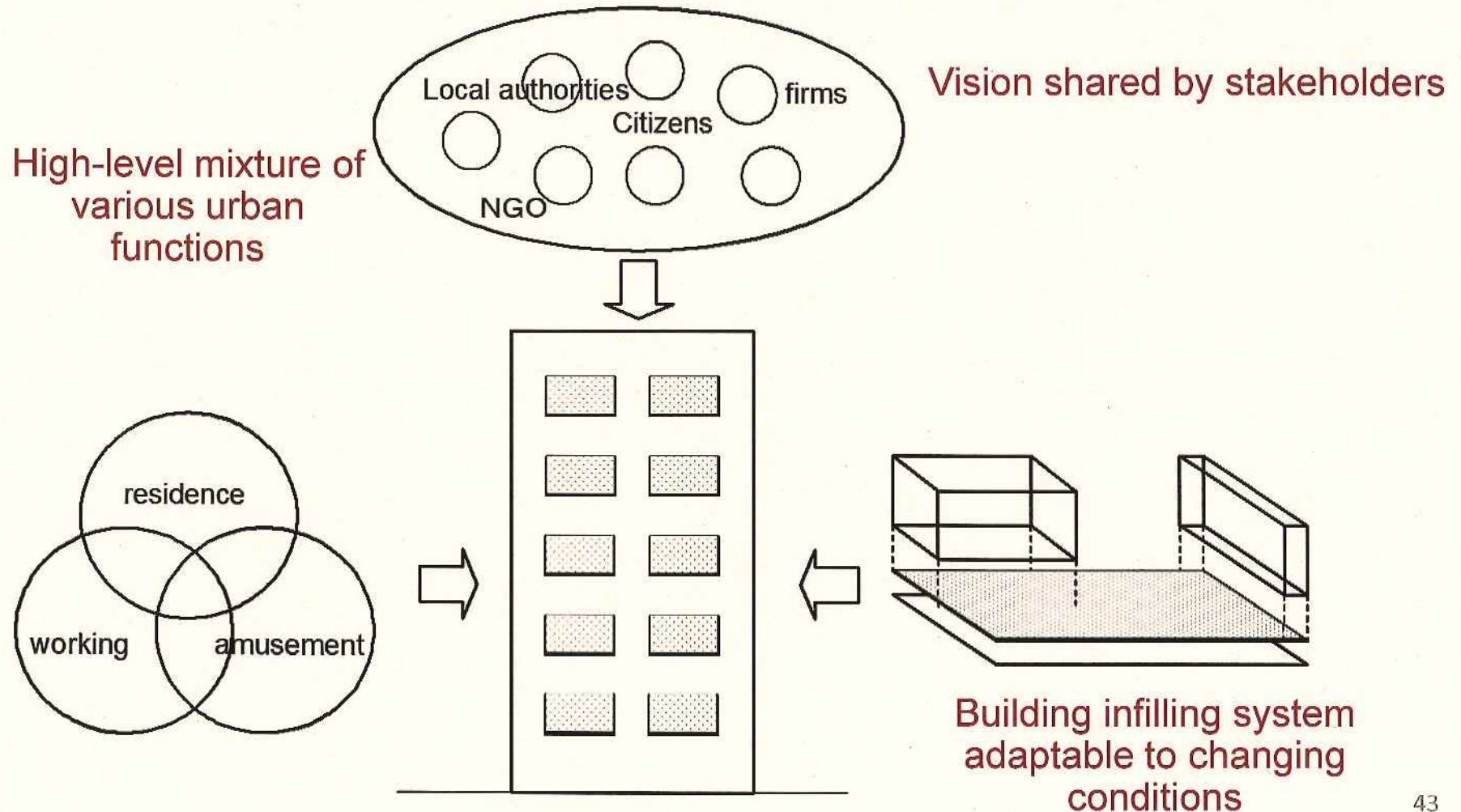


Typical vacant office in a declining central area in Tokyo

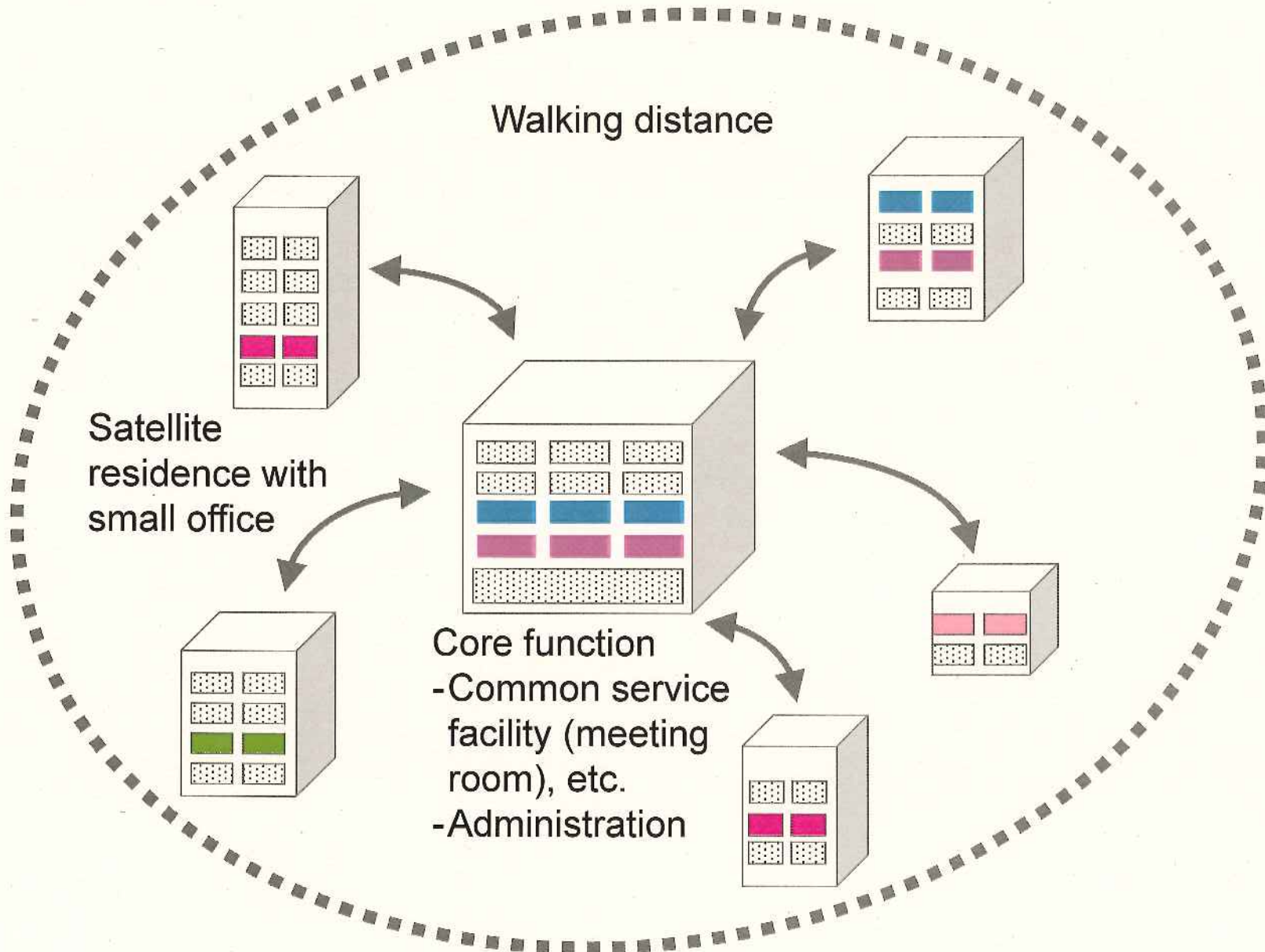




Partnership for regeneration of small size buildings



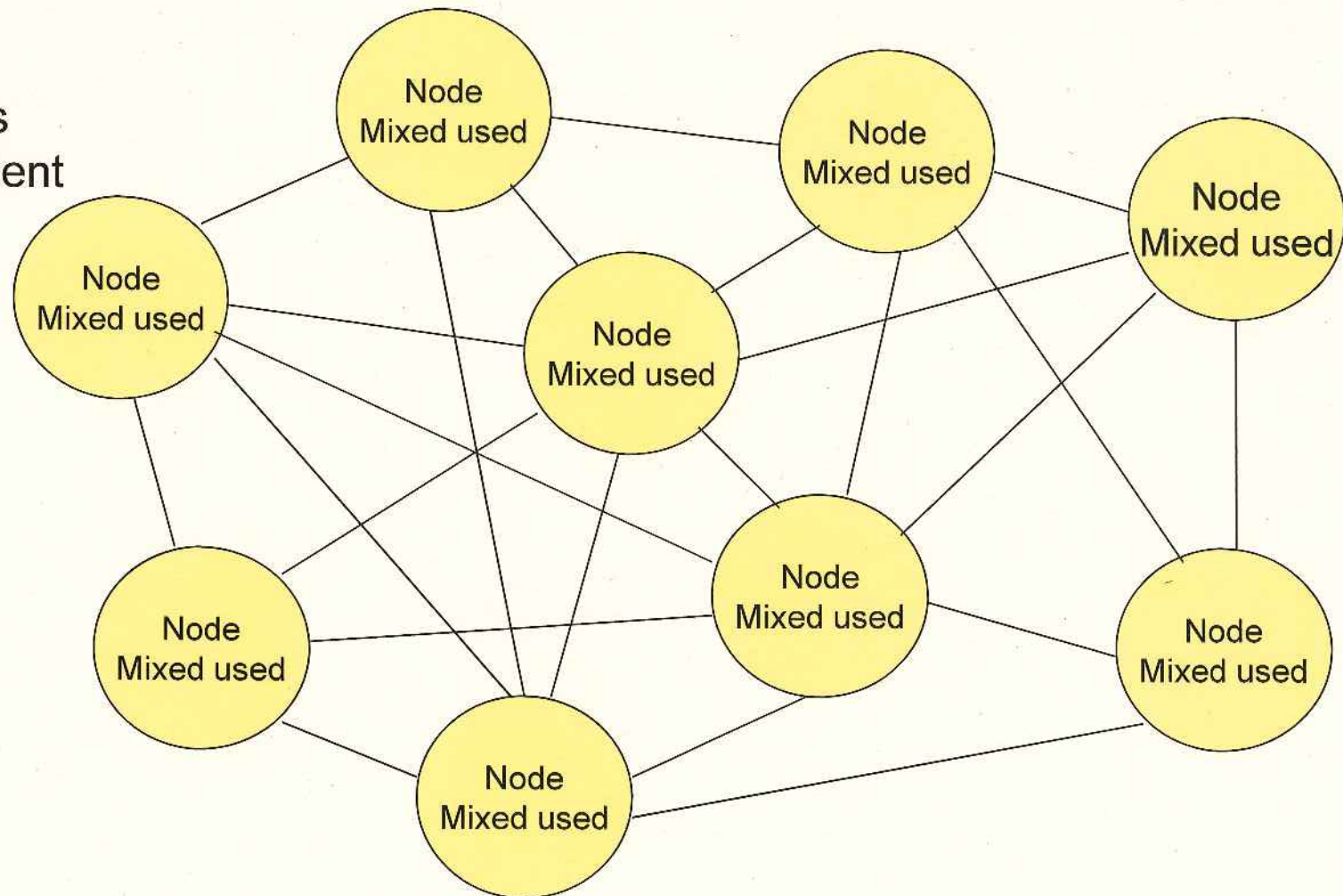
Network of new installed infill could be the center of knowledge creation



Sustainable city structure in the knowledge based economy will be improved by the independence of highly characteristic districts in the city.

Logistics and networks of
-Products
-Information
-Transactions
are independent

Center of sticky information/knowledge



An aerial photograph of a dense urban landscape, likely Tokyo, Japan. The Tokyo Tower is the most prominent feature, standing tall in the center-right of the frame, highlighted in a bright red color. The surrounding city is filled with numerous skyscrapers and residential buildings, creating a complex, layered skyline. The sky is a clear, pale blue, suggesting a bright day. The overall scene conveys a sense of a highly developed and densely populated city.

There exist seeds in Japan.
What is required is ambition to be changing
agents who enhance holistic approach