

EAROPH Golden Jubilee World Congress 2010 in Adelaide

[S7 Renewable Energy]

*Smart House and Office
Building Technology*

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Japan's Policy Directions to Create Environment-Friendly Cities

Japanese GHG Emission Target

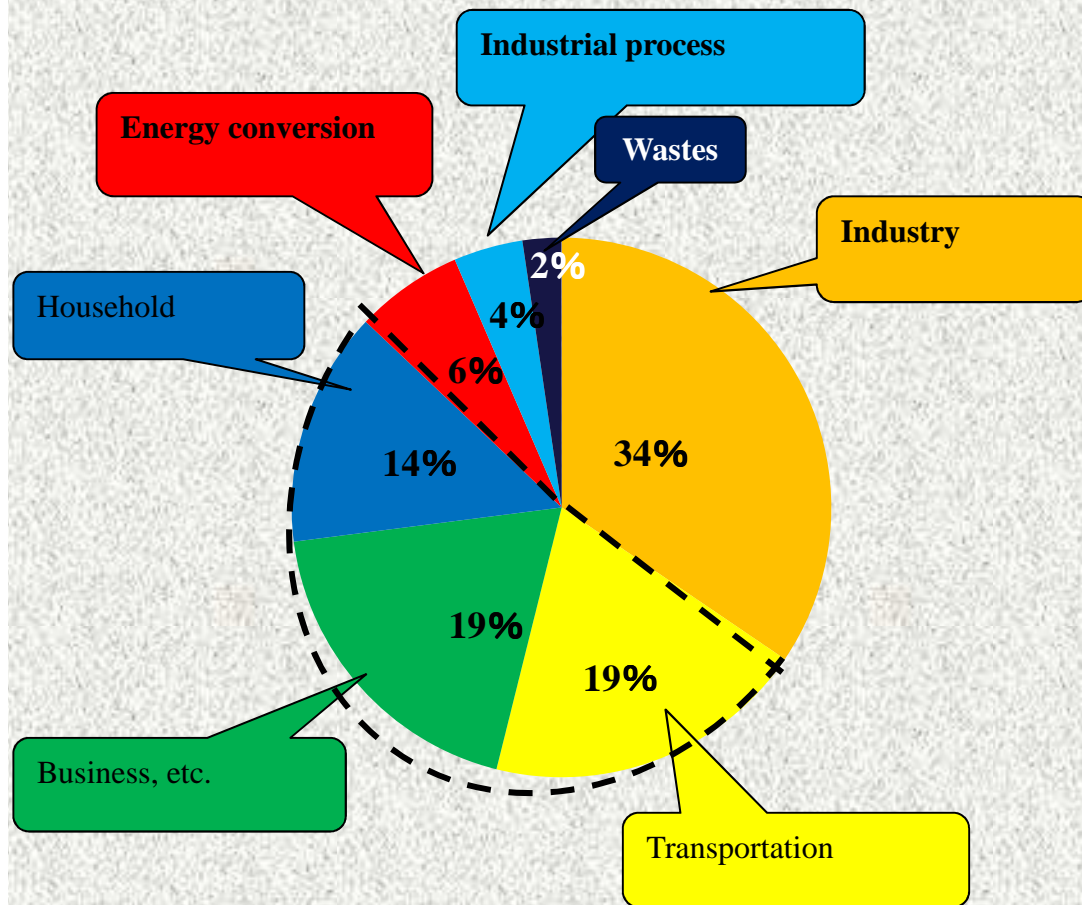
Japan is willing to be associated with the Copenhagen Accord and its quantified economy-wide emissions target for 2020

“Reducing greenhouse gas emission of 25% by 2020, if compared to the 1990 level, which is premised on the establishment of a fair and effective international framework in which all major economies participate and on agreement on their ambitious targets.”

(Submitted to the Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC) , January 28, 2010)

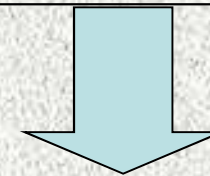
Where does Greenhouse Gas come from?

Segmental breakdown of carbon-dioxide emissions (2008)



Total 1.214 billion tons (CO₂)

Half of greenhouse gas emissions are mainly caused by activities in urban area



Cities are a key element to achieving greenhouse gas reduction target

Future Direction of Urban Policies – Realization of ‘Compact City’ -

Why Compact City Now?

In declining and aging population, cities are expected to be more efficiently managed, coping with global environmental issues.



Compact City is the major future direction of urban policy!

What is the policy target of “Compact City”?

To realize a sustainable city in terms of social, economic and environmental aspects.

Economic Aspect

Ensuring sustainable development, fully utilizing historical and cultural resources peculiar to each local area and creating new industries

Social Aspect

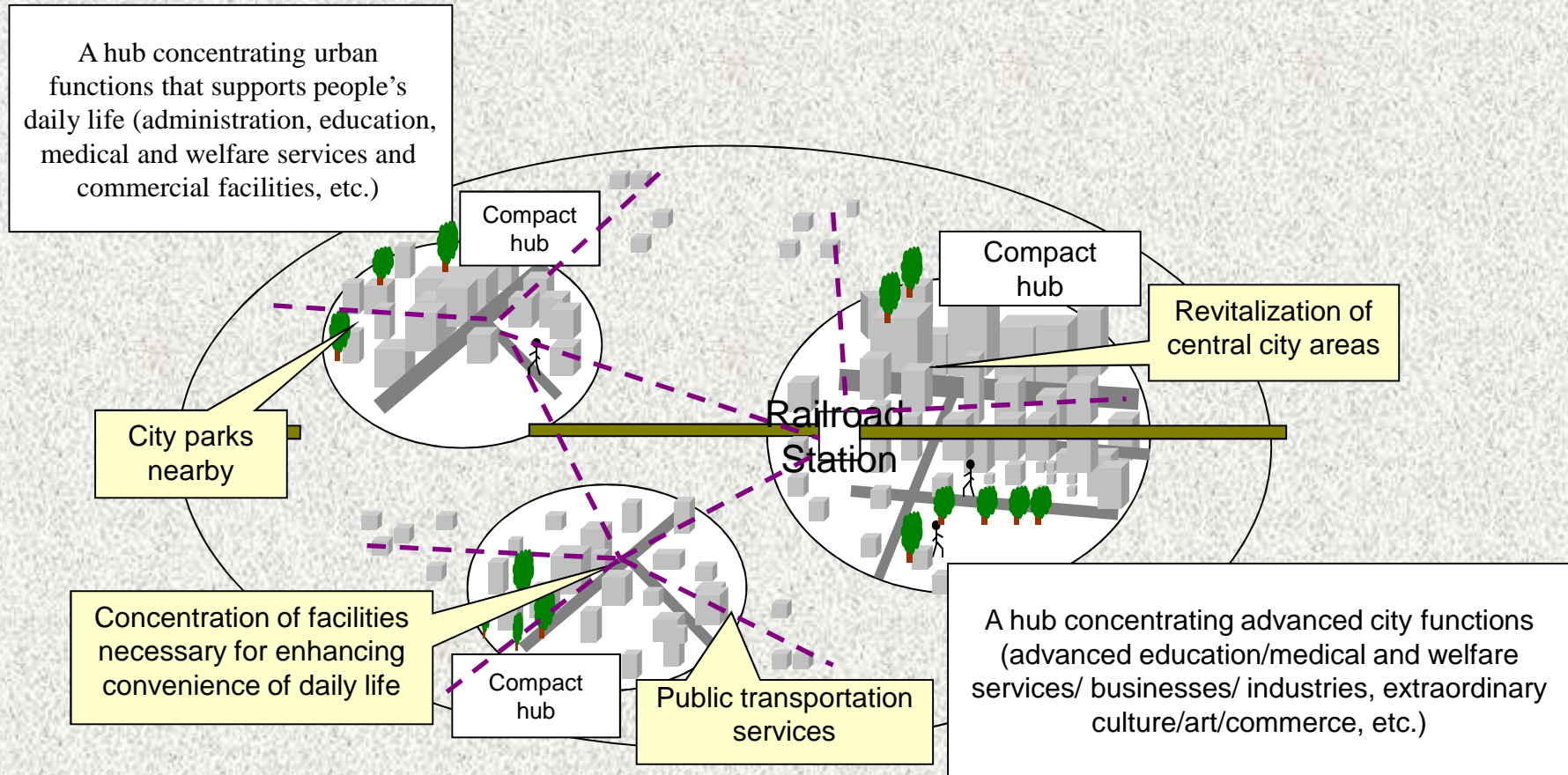
People’s lives and properties are protected against natural disasters and crimes.
All citizens are able to spend active and quality
Good access to welfare and medical services.

Environmental Aspect

Walking and/or a bicycle is the main transportation.
Good access to public transportation
High energy efficiency and efficient circulation of resources
Cities harmony with nature

'Compact City' or Low-Carbon City -

Compact City



Eco-City supported by technological excellencies and management skill.

Infrastructure

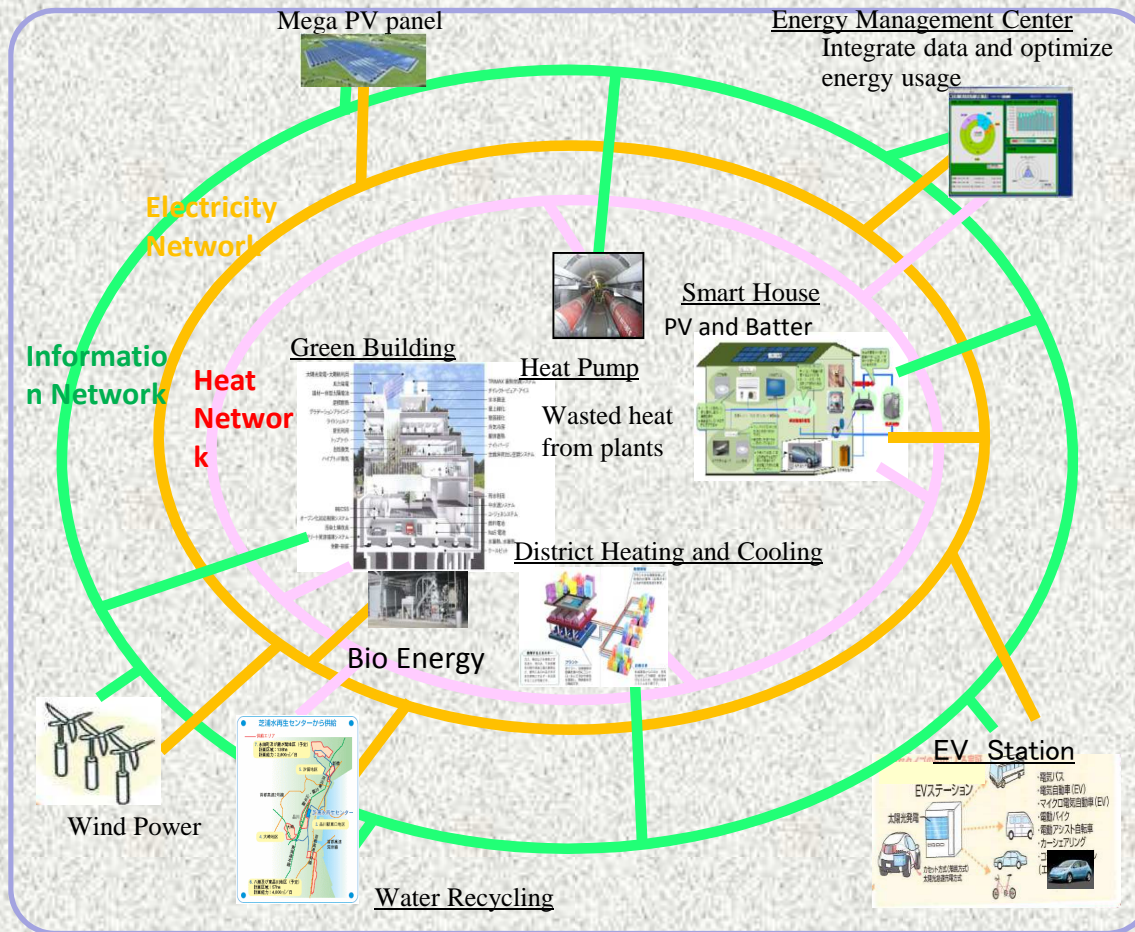
- Optimize energy use (renewable energy, co-generation, district heating and cooling)
- Water supply and sewage (water recycling)
- Resource circulation (waste recycle)

Environmental Protection

- Preservation of natural resources
- Reduce negative impact on environment

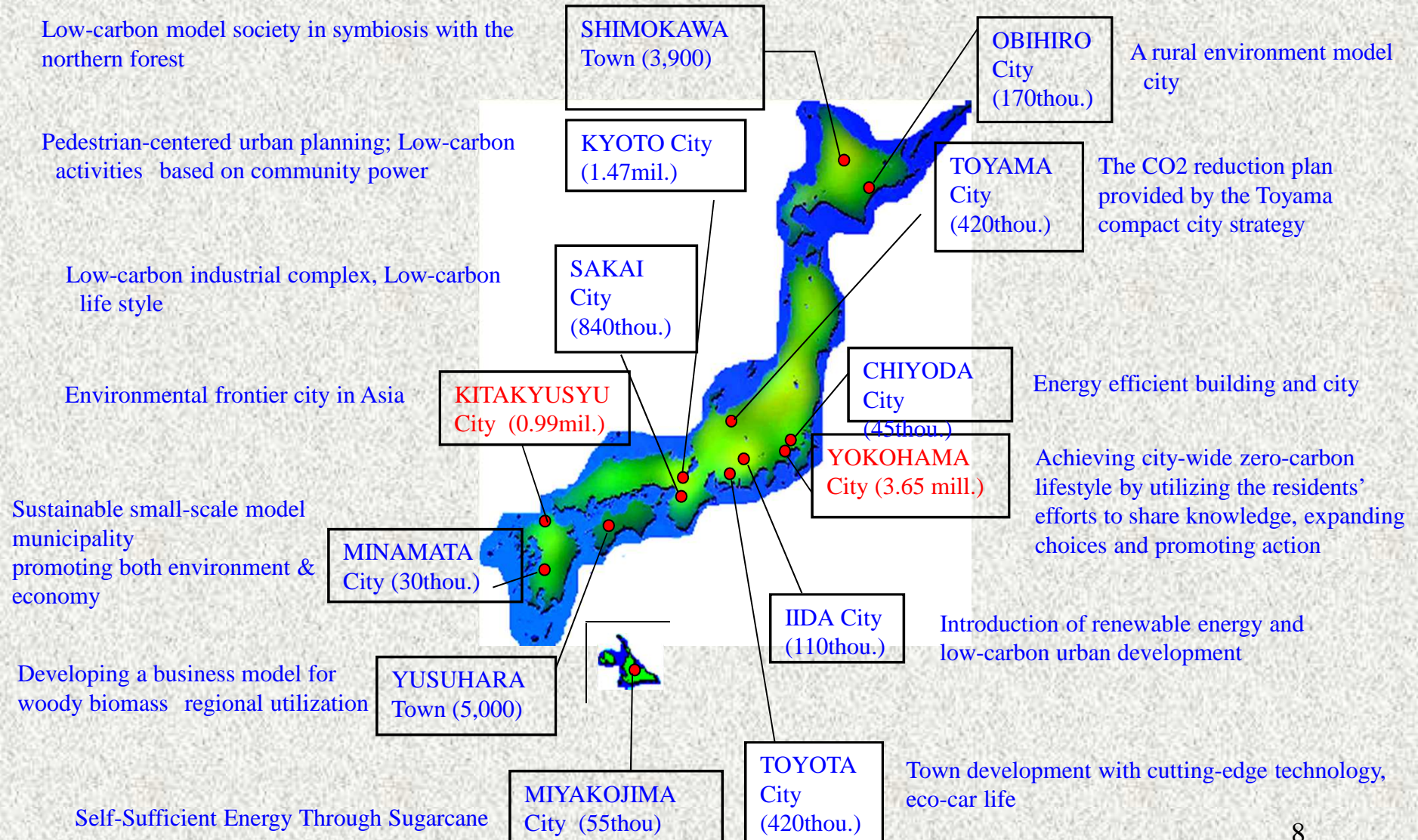
Eco Urban Design

- Urban Design
- Landscape and preservation of green area(Network of green and water, green city)



Eco-Model Cities Initiatives in Japan since 2008

13 Eco-Model Cities are the front runners to achieve Low Carbon City as role models.



Kitakyushu City's Initiatives

Population: 0.99 million (As one of the most advanced industrial cities in Japan, Kitakyushu City succeeded in overcoming industrial pollutions.)

Target

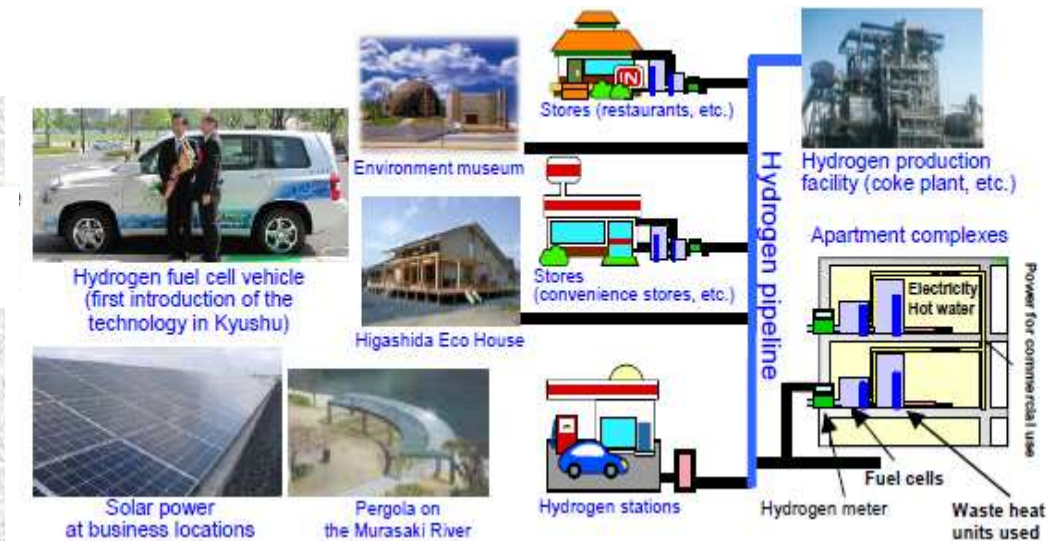
1. Reduce GHG emission by 30% until 2030, by 50-60% until 2050.
2. Through technical support to the Asian region, reduce GHG emissions by 150%.
3. Realize Eco-Model City in the Asian region.

Tools

1. Introduce renewable energy
2. Achieve Low-Carbon Asia by transferring environmental technologies of Kitakyushu City

Supply unutilized energy

Realize Hydrogen-Town



Solar Factory



Yokohama City's Initiatives

Population: 3.67 million (the most populated city in Japan)

Target

1. Reduce wasted garbage by 30% by collaborating efforts by the citizens.
<Already achieved the target>
2. Reduce GHG emission by 30% until 2030, by 60% until 2050.
3. Achieve zero carbon life in the mega city by collaborating efforts by the citizens.



Tools

1. Encourage zero-carbon life
2. Renewable energy
(Increase the renewable energy by 10 times)
3. Promote EV
4. Good collaboration with rural area



Promotion Council for the Low-Carbon Cities

Established in December, 2008.

Memberships

- 85 city and municipality governments
- 46 prefecture governments
- 12 ministries in national government
- 25 governmental organizations

Purpose:

- To become the platform of local governments which pursue to become low carbon cities.

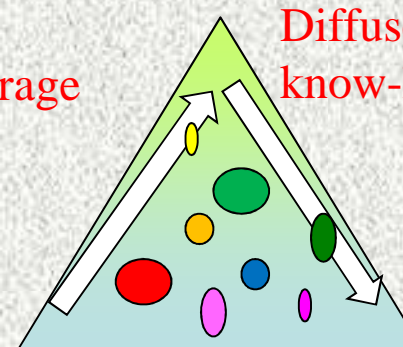


Activities:

- Expand good practices of low carbon cities.
- Work hard and learn from other city's experience.
- Encourage global communication.



Encourage
efforts



Diffuse
know-hows

Realize low
carbon society

&

Create
resilient
community

Japan's New Growth Strategy

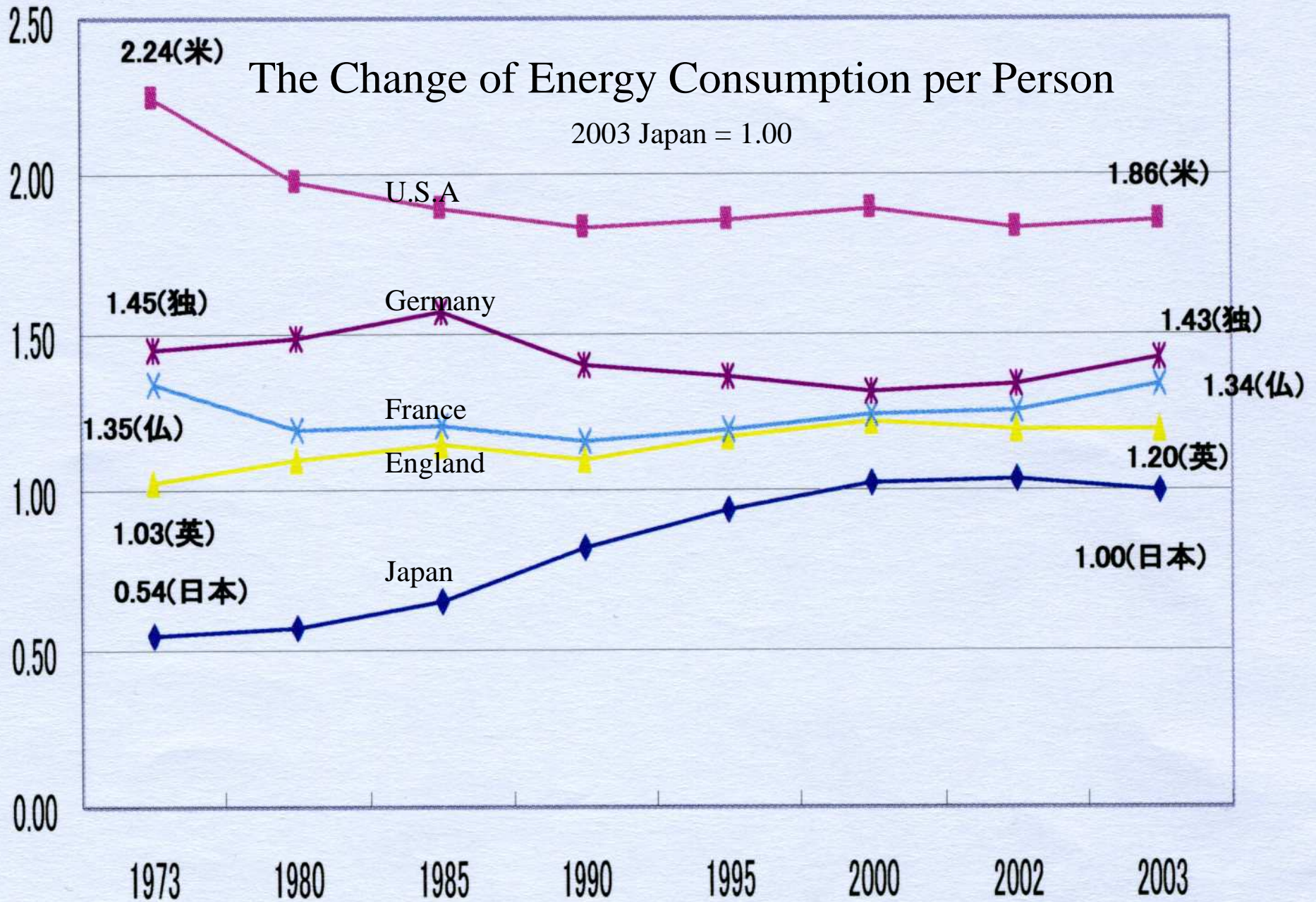
The New Growth Strategy ~Blueprint for Revitalizing Japan~ (Cabinet Decision: June 18, 2010)

“Spread Japan’s “safety and security” technologies throughout Asia and the world”

“We will develop and provide infrastructure with Japanese excellent environmental technologies as a package throughout the Asian region. We will work to lessen the environmental burden accompanying the economic growth of Asian countries and make use of Japanese technology and experiences as a sustainable growth engine for Asia. Specifically, government and the private sector will work together to provide assistance in building infrastructure such as high-speed rail and urban transport, water supply, and energy, and in the development of cities that are in harmony with the environment. “

The Change of Energy Consumption per Person

2003 Japan = 1.00



出典: エネルギー・経済統計要覧から資源エネルギー庁作成

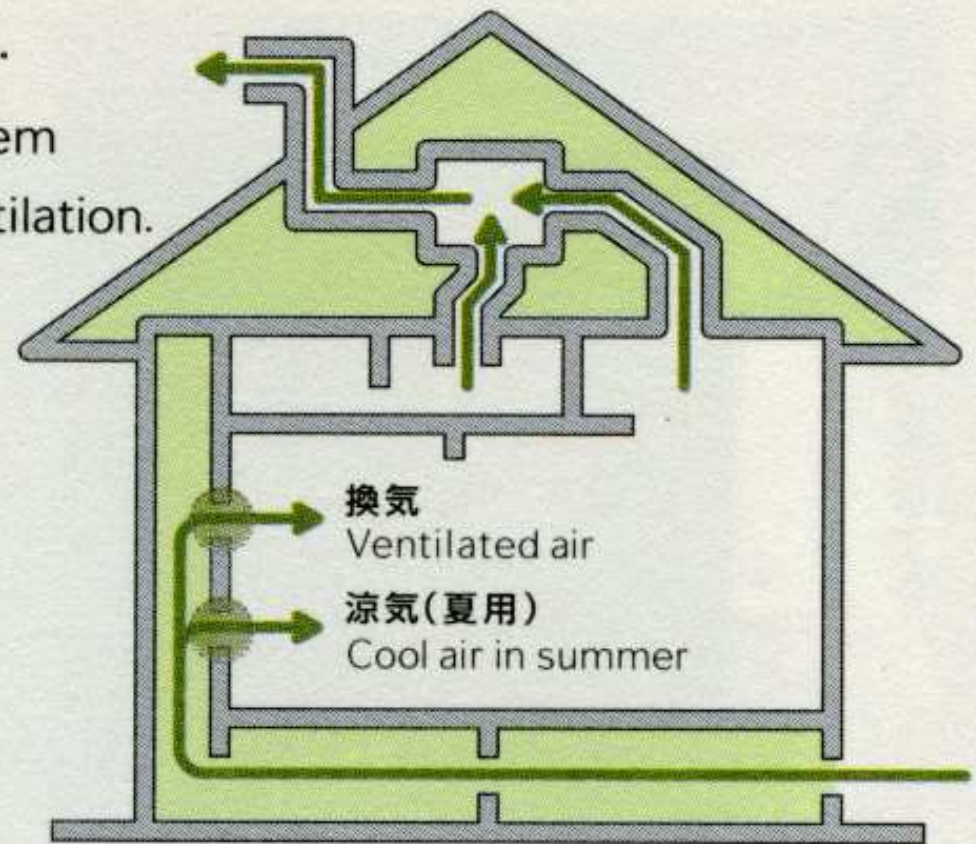
You know already that Japan has been doing some good efforts and in the good position in the world.

Now, we will introduce some actual techniques as follows.

Cleaning air throughout the house with the natural blessing.

This is a hybrid air-conditioning system combining natural and mechanical ventilation.

The Wind Passage Tower S installed in a living room takes in cool air in summer and warm air in winter beneath a floor to realize effective energy-saving ventilation.



Using energy generated from heat in the air

An energy conservation technology that gathers, transfers and utilizes heat scattered in the air is adopted in refrigerators, air conditioners, washers/dryers and hot water supplies. It reduces power consumption and saves lighting and heating expenses.



Fuel Cell

Household power generation system that generates electricity and hot water

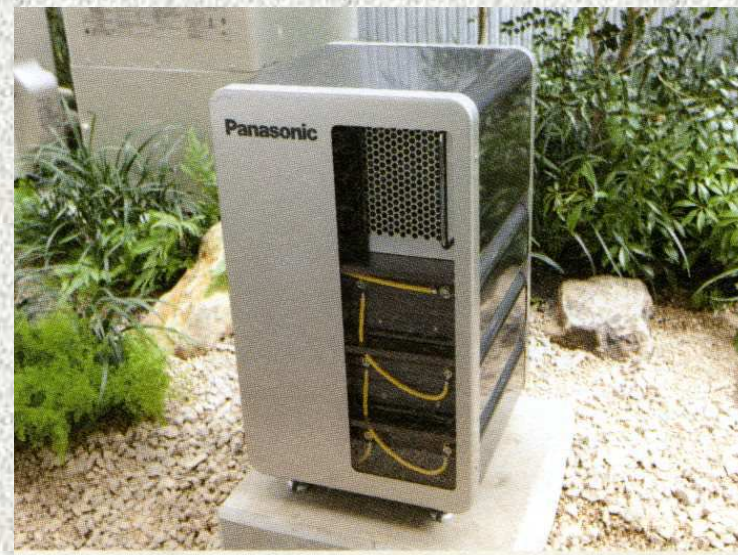
Fuel cells generate electricity in a home using city gas (hydrogen) and air (oxygen). It also boils water with heat generated at the same time as electricity and uses this hot water for showers and floor heating systems.



Accumulator battery

Storing electricity for when it is necessary

By adopting lithium-ion batteries capable of accumulating a large amount of energy in a small body, the system realizes a compact body and high performance. It allows optimization of the power use inside a house, backing up the fuel cells and solar power generator. (exhibiting for reference)

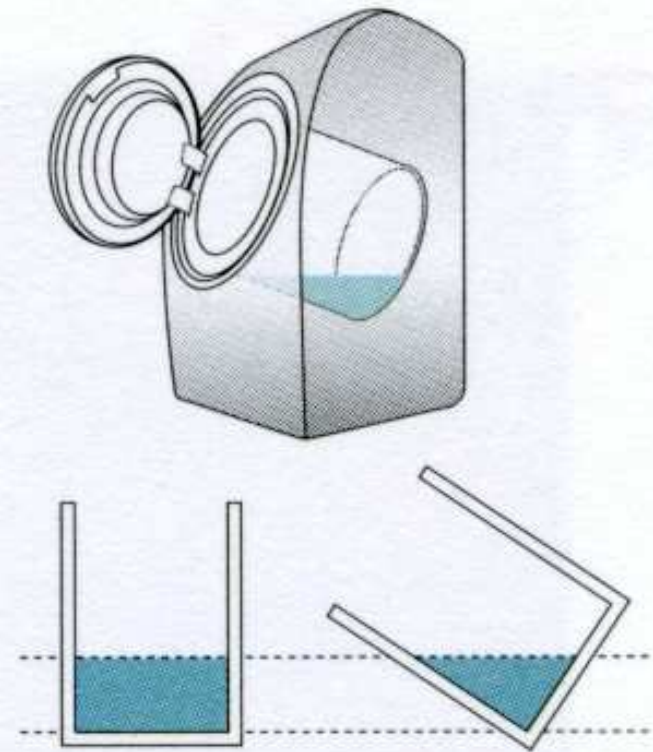


Reducing water bill and CO₂ emissions in washing everyday

This washer/dryer washes and dries with less water.

An amount of water used for washing is radically reduced by tilting a washing tub.

The ecological washer/dryer that dries clothes rapidly using the heat pump technology consequently cuts electricity costs.



Saving energy with thermal insulation technology

The vacuum insulation panel now have broader applications, from home appliances such as refrigerators and jar pots, to residential equipment such as bath units, and building materials. U-Vacua, the vacuum insulation panel developed by Panasonic, greatly contributes to energy-saving with improved insulation performance.



Line-up of Energy Conservation Technologies : Eco-Buil-Pack 50

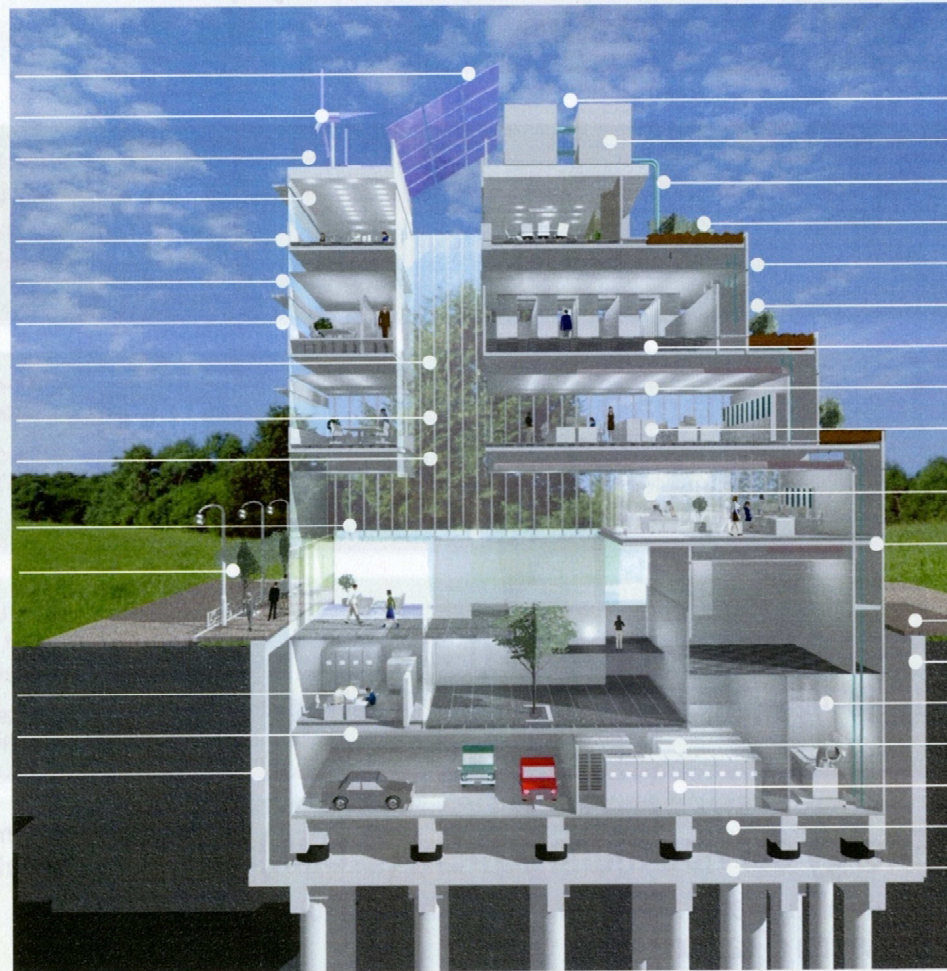
Energy Saving (Architecture)

Energy Saving (M&E)

Natural & Renewable Energy Use

- PV Cell, Solar Heating
- Wind Power
- PV Cell on Building Element
- Roof Insulation
- "Gradation" Blind
- Light Shelf
- Daylighting
- Top Light
- Natural Ventilation
- Hybrid Ventilation
- Low-E Glazing
- Dry Mist

- BECSS**
- Large Temperature Difference Air-conditioning
- Closed-loop Concrete System
- Adaptaion of Energy-efficient Equipment
- Energy-efficient Equipment Operation
- Grasping Energy Consumption Status

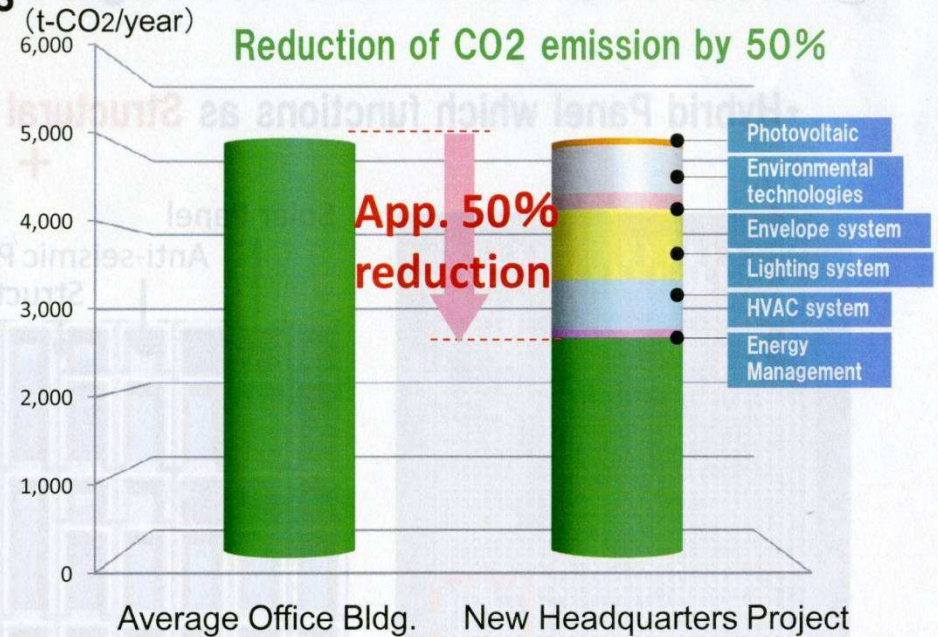


- "Trimax" Thermal Energy Storage System
- "Direct Pure Ice" System
- Ice Transportation for cooling
- Rooftop Garden
- Green Wall
- Outdoor Air Intake Control
- Building Thermal Mass Storage
- Night Purge
- Task & Ambient HVAC System
- Human Sensing Lighting System
- Outdoor Air Cooling
- Rainwater Use System
- Water Reuse System
- Co-generation System
- Fuel Cell
- NaS Battery
- Ice/Water Storage
- Cool Pit

For existing & new construction bldgs.

Shimizu New Headquarters Project CO₂ -50%

- Half Carbon Office that makes the full use of leading edge environmental load reduction technologies



● Main Environmental Technologies

Advanced energy saving technologies **-35%**

- Envelope system app. -200 tons CO₂/year (-4%)
- Lighting system app. -850 tons CO₂/year (-17%)
- Air-conditioning system app. -600 tons CO₂/year (-12%)
- Energy Management app. -100 tons CO₂/year (-2%)

Conventional energy saving technologies **-15%**

- Air-conditioning VAV • Outdoor Air Cooling -60 tons CO₂/year
- Rooftop Greening • Wall Greening -7 tons CO₂/year
- LED lighting -45 tons CO₂/year
- Water reuse • Water conservation -25 tons CO₂/year
- Ventilation VAV -10 tons CO₂/year
- High efficiency transformers -35 tons CO₂/year
- VWV • Large temperature difference air-conditioning -75 tons CO₂/year

Technical Solution of Carbon Management

Shimizu's Technological Solution

- Examining CO₂-reduction measures in each of four areas (as below)
- Offering solutions that encompass property operation and facility management as well as office-space use

CO₂ reduction solutions for customers

1 Design engineering management (D.E.M)
Construction innovations at the design stage

MAX
-40%

- Facade/roof solutions
- Air-conditioning solutions
- Electrical-power solutions
- Sanitation solutions

2 Property management (P.M.)
Building management innovations at the operational stage

MAX
-10%

- Air-conditioner tuning during operations
- Electric-consumption tuning during operations

3 Facility management (F.M.)
Usage-related innovations at the operational stage

MAX
-20%

- Solutions to ensure supply of just the required amount when needed
- Heat-source isolation and zoning solutions

4 Energy service management (E.S.M.)
Renewable energy management and the creation acquisition of carbon credits

MAX
-30%

- Renewable energy solutions
- Carbon credit solutions

Former Prime Minister Hatoyama's proclamation in UN in 2009 that Japan will reduce the carbon emission by 25% by the year of 2020 may be achieved if we can decrease by half in office and household and 10 to 20% in transportation and manufacturing.

Transportation sector is now doing two big efforts to reduce carbon emission. One is the introduction of hybrid engine or electric automobile and another is the promotion of public transportation.

Manufacturing sector may continue their effort and realize the less carbon emission production system.

The problem would be office and household sector.

There are some proposals from private sector on the matter.

They are aiming 50% cut of CO₂ emission in near future and total cut in the long future.

Conclusion and acknowledgement

As mentioned above, it is not impossible to save carbon emission as Japan submitted to the Secretariat of the United Nations Framework Convention on Climate Change. But as the total emission of Japan is not so large if we compare with those of USA and China, it is highly expected to keep the world cooperation on this matter. I would like to repeat the message from the Government of Japan, which is stated in the New Growth Strategy, that Japan is ready to cooperate with Asian countries to create low-carbon society.

We thank a lot to Shimizu Corporation and Panasonic Electric Works Corporation for their helpful suggestions and materials rendered.

**Thank you very much ladies and gentlemen
for coming to the Golden Jubilee
EAROPH World Congress**