添付資料 12　本邦研修資料

JICA's Assistance on Climate Change

October 30, 2012

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Today's Topic

- Definition of Climate Change Project on ODA
- Japan's Official Development Assistance on Climate Change: Related Organizations
- Recent development of Japan's Official Assistance on Climate Change
- Japan's Commitment of Assistance on Climate Change:First-Start Financing
- JICA (Overview, Mainstreaming Climate Change, programs)
- JICA activities on Climate Change (Example)

Definition of Climate Change Project in ODA

DAC/OECD Marker: The Rio marker on climate change relates to climate change *mitigation* only, with no data currently available on ODA spending for climate change *adaptation*. In December 2009, DAC Members approved a similar marker to track ODA in support of climate change adaptation. This new climate change adaptation marker will complement the existing DAC marker on climate change mitigation, and thus allow presentation of a full picture of all aid in support of developing countries' efforts to address climate change.Definition by OECD/DAC is distributed.

Japan's Official Development Assistance on Climate Change Related Organizations

- Ministry of Foreign Affairs
- Ministry Economy Trade, Industry
  NEDO (New Energy and Industrial Technology Development Organization) Mainly Energy Field (F/S studies, Demonstration Project)
  http://www.nedo.go.jp/english/index.html
- Ministry of Agriculture, Forestry and Fisheries
  Forestry and Forestry Products Research Institute
- Ministry of Land, Infrastructure, Transport and Tourism

Japan's Official Development Assistance on Climate Change Related Organizations

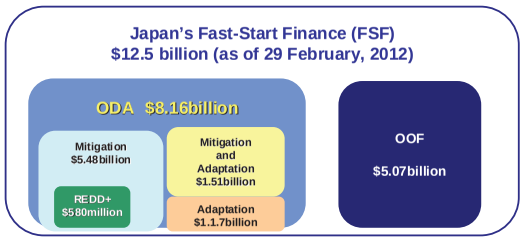
- Ministry of Environment
  National Institute for Environment
  Global Environmental Center Organization
  Feasibility Studies on New Mechanism(Bilateral Offset
  Credit Mechanism (BOCM)) and on CDM/JI
  Institute for Global Environmental Strategy
  Overseas Environmental Cooperation Center

Recent development of Japan's Assistance on Climate Change

- Japan's Vision and Actions toward Low-Carbon Growth and Climate Resilient World(2011.11)
- African Green Growth Strategy(2011.11)
- More involvement of private sector
  PPP(Public-Private Partnership), BOT(Base of Economic Pyramid)
- Japanese Company (Promotion of Investment) in Asia, India….
- New Mechanism(Bilateral Offset Credit Mechanism (BOCM))

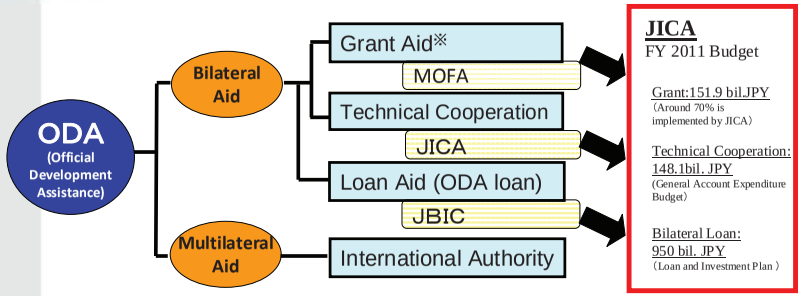
◆Japan's Fast-Start Finance (FSF)

Japan has been strongly supporting sustainable developments and actions on climate change in developing countries.
Japan announced its Fast-Start Finance (FSF) of 15 billion dollars, up to 2012, which represents around a half of global commitments under the Cancun Agreements. Japan's FSF is to assist developing countries, especially those making efforts to reduce GHG emissions and/or that are particularly vulnerable to climate change. The total amount 15 billion dollars has been channeled through ODA (around 7.2 billion dollars) and other official flows (OOF) (around 7.8 billion dollars) for both mitigation and adaptation.



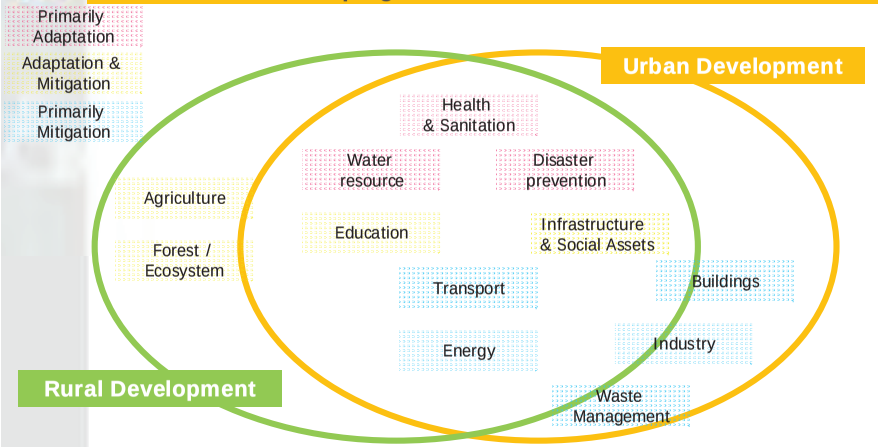
1.About JICA

- The current JICA was inaugurated in October 2008 with a merger of
  1) Technical Cooperation of the existing JICA,
  2) Loan Aid operation (ODA loans and Private Sector Investment Finance (PSIF)) of the Japan Bank for International Cooperation (JBIC), and
  3) a large portion of Grant Aid implementing operation of the Ministry of Foreign Affairs (MOFA).
- JICA provides strategic and effective ODA through integrated, comprehensive and seamless implementation of Technical Cooperation, Loan Aid and Grant Aid as one of the largest ODA executing agency in the world.



※Non-project Assistance and Emergency Grant Assistance remain with MOFA

2. Sustainable Development and Low-Carbon / Climate Resilient Actions in Developing Countries



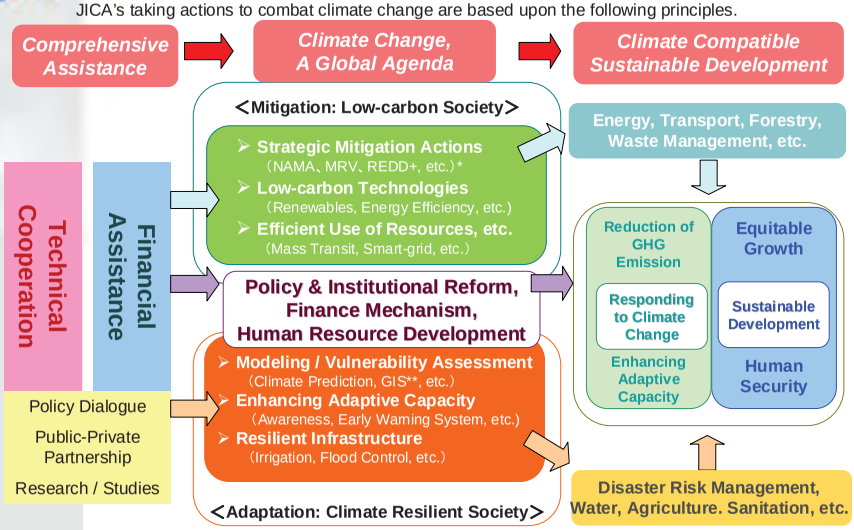
Sectors in need of adaptation and with potential of mitigation are critical components of sustainable development

- climate actions in developing countries ***must*** be implemented in the context of sustainable development

3.JICA's Approach: Low-Carbon and Climate Resilient Development Cooperation

◆Direction of JICA Operation Addressing Climate Change

JICA's taking actions to combat climate change are based upon the following principles.



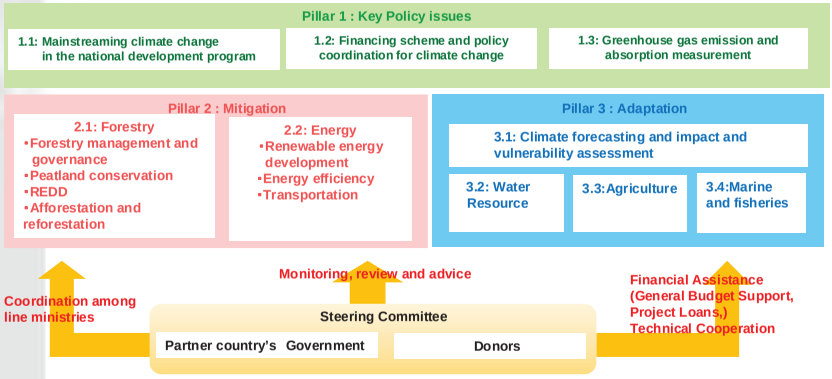
PDCA Cycle: Four-step (Plan, Do ,Check and Action) management cycle ,which continuously improves the processes

**MRV (measurable, reportable and Verifiable) : Approach which enables to measure , report and certificate the amount of GHG reduction due to mitigation projects

4.Policy Based Assistance for Climate Change Policy in Developing Countries

Low Carbon and Resilient Development Program is an innovative scheme to facilitate the implementation of climate change policies through financial and technical assistance for developing countries in alignment with their national development policies and strategies. The initiation of Low Carbon and Resilient Development Program is by first formulating the policy matrix of multi-year policy pillars based on policy dialogues.

Policy Matrix Example



JICA signed Loan Agreement of Low Carbon and Resilient Development Program with Indonesia in September 2008 as its first case. Through the year 2008, JICA conducted monitoring and also provided advisory services to Indonesia to achieve the secure implementation of their National Action Plan addressing Climate Change. JICA and Indonesia signed their 2nd and 3rd agreements to finance Low Carbon and Resilient Development Program after modification of the policy matrix to improve effective, feasible and tangible policy actions based on year-round monitoring. JICA also signed the same type of program loan agreement with Vietnam in June 2010 and its second term in November 2011.

5.Climate Finance Impact Tool (JICA Climate-FIT)

JICA has prepared Climate Finance Impact Tool (JICA Climate-FIT) ,a reference document which contains the following components in order to facilitate consideration of policies and formulation of projects for assisting climate change related measures in developing countries.

1.Methodologies for implementing measurement, reporting and verification (MRV) related to quantitative evaluation of mitigation projects that contribute to reduction or sequestration of greenhouse gases (GHG)

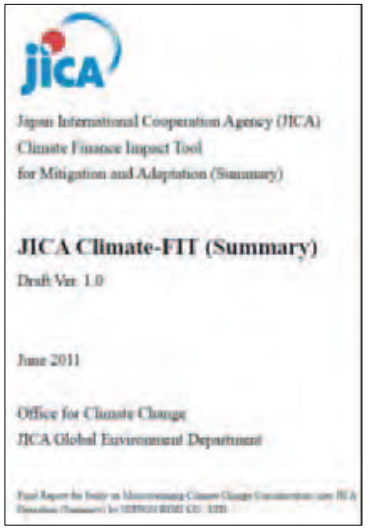
2.Concepts and guidelines for mainstreaming adaptation considerations into projects that contribute to reduction of vulnerability against climate change, and sustaining and increasing adaptive capacity and resilience

JICA Website URL

(Japanese) http://www.jica.go.jp/activities/globalization/climate.html

(English)

http://www.jica.go.jp/english/operations/climate_change/index.html


Japan International Cooperation Agency (JICA)
Climate Finance Impact Tool
for Mitigation and Adaptation (Summary)

JICA Climate-FIT (Summary)

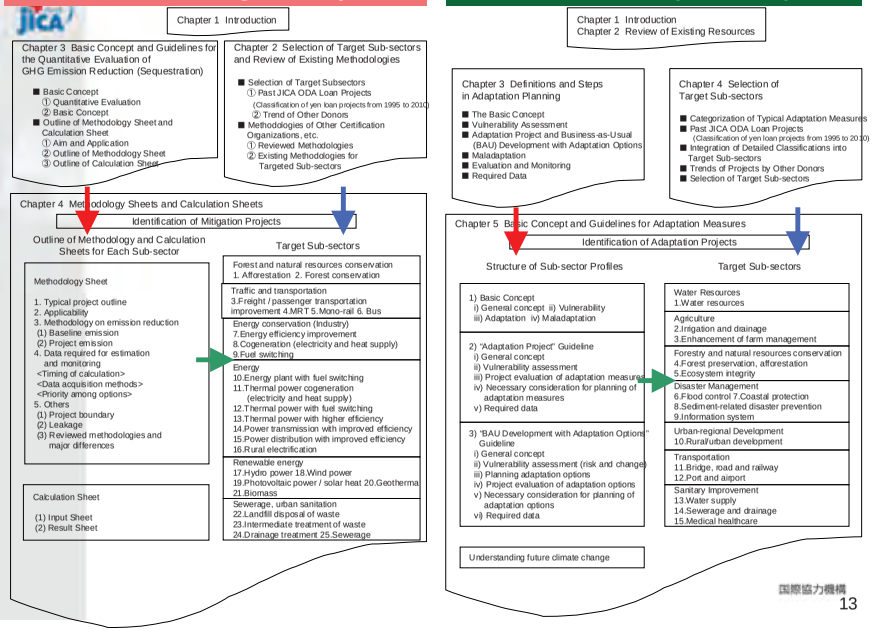
Draft Ver. 1.0

June 2011

Office for Climate Change
JICA Global Environment Department

Framework of Mitigation Report

Framework of Adaptation Report



6. Example of Mitigation Impact Evaluation

(1) Transport, Energy, Waste Management

Greenhouse gas (GHG) Emission Reduction (*ERy*) is the difference between without-project emission (Baseline Emission: *BEy*) and with-project emission (Project Emission: *PEy*).

$$ERy = BEy - PEy$$

ERy : GHG Emission Reduction after mitigation actions
BEy : Without-project emission (Baseline Emission)
PEy : With-project emission (Project Emission)

Baseline Emission
- Status-quo GHG emission when the project is not implemented
- GHG emission is calculated based on the assumption that the output level (electricity, production amount) is equal to the with-project case

Project Emission
- GHG emission when the project is implemented
- In general, Project Emission is less than Baseline Emission
- For renewable energy, Project Emission is zero.

7.Case of Mass Rapid Transit (MRT)

BE_y: Baseline Emission (without-project)　　PE_y: Project Emission (with-project)

Case of Two Step Loan
(assistance to many end-users thru financial intermediaries)

Simplified methodologies for GHG emission may be used with due consideration to JICA Climate-FIT as well as data availability and the amount of work

7.Case of Forestry

Trees grow by photosynthesis and sequestration of CO2 in the atmosphere = forest areas are sinks of CO2 (or carbon)

Net anthropogenic GHG sequestration by afforestation: $ER_{AR,y}$ is the difference of a) increase (or decrease by thinning or harvesting) of CO2 stock in a fixed time period when afforestation is implemented (Project Sequestration: $\Delta C_{PRJ,y}$) and b) increase (or decrease) of CO2 stock when afforestation is NOT implemented (Baseline Sequestration: $\Delta C_{BSL,y}$) + GHG Emission when implementing afforestation project (Project Emission: $GHG_{PRJ,y}$).

$$ER_{AR,y} = \Delta C_{PRJ,y} - \Delta C_{BSL,y} - GHG_{PRJ,y}$$

ERAR,y : net anthropogenic GHG Sequestration in Year y (t-CO2/y)
ΔCPRJ,y : GHG Sequestration with afforestation in Year y (t-CO2/y)(Project Sequestration)
ΔCBSL,y : GHG Sequestration without afforestation in Year y (t-CO2/y)(Baseline Sequestration)
GHGPRJ,y : GHG Emission with afforestation in Year y (t-CO2/y)(Project Emission)

JICA program: Highly Concessional Climate Change Japanese ODA Loan

- Highly concessional compared to past preferential terms
- Candidate projects can be processed on a “Fast Track” basis (e.g. a loan request can be made at any time and is considered separately from ordinary projects).
- Provided to developing countries which make efforts to reduce GHG emissions and to achieve economic growth in a compatible manner, on the basis of policy consultations between Japan and those countries
- Covers projects and programs that contribute to mitigation (increased access to clean energy and adaptation may also be included)

Category	Interest Rate (% p.a.)	Repayment Period (year)	Grace Period (year)
LDCs	0.2	40	10
Low-income countries	0.25	40	10
Lower- middle-income Countries	0.3	40	10
Middle-income countries	0.3	40	10
Upper-middle income countries	0.6	40	10

* Option terms (interest rate and repayment/grace period) are available for each category (e.g. LDC may opt for 0.15% interest rate, 30(10) year repayment (grace) period.)

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JICA program: Preparatory Study for PPP Infrastructure Projects

Partnership with Japanese private firms based on PPP infrastructure

Preparatory Study for PPP Infrastructure Projects

Feasibility study scheme to determine appropriate division of roles between public and private partners, with due consideration to private sector initiative

Example of collaboration between PPP and ODA loan Thailand:Laem Chabang Port

About Preparatory Study for PPP Infrastructure Projects

- Study topic is selected from among proposals from private sector planning to participate in infrastructure projects (including EPC and operation / management)
- Max. JPY 150 mil. covered by JICA
- High profile study in relation to the key policy goal under the New Growth Strategy of Japan (creating business at all phases of overseas infrastructure development)

PPP Infrastructure and JICA Partnership

(example by type of partnership)

- **“Vertical Separation”:** JICA assists project planning and basic infrastructure building before facility construction and operation by private firms (Vietnam: Lach Huyen Port / basic infrastructure such as water breaker = JICA ODA loan, terminal development = private sector [in preparation])
- **“Stage Separation”:** JICA assists first stage of a project, followed by private sector initiative such as BOT (Vietnam: Phu My Thermal Power Plan / Japanese power company etc. entered into power plant BOT after assistance by JICA ODA loan)
- **“Construction by Public Sector / Operation by Private Sector”:** Private firms are awarded contracts for operation of infrastructure constructed using JICA funds (Thailand: Laem Chabang Port / Japanese shipping company)

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JICA program: Grant Aid

Grant Aid is financial cooperation implemented by the Japanese government with no obligation for repayment by the developing country concerned. Targeted mainly at developing countries with low income levels, this type of aid covers a wide range of cooperation related to the future of developing countries, including development of social and economic infrastructure, such as the construction of hospitals or bridges, as well as education, HIV/AIDS awareness, children's health, the environment and other areas.

Programme Grant Aid for Environment and Climate Change: Support for adoption of policies and planning related to global warming countermeasures, etc., and for related projects.

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JICA program: Grant Aid

Grant Aid for General Projects: Support for projects implemented for basic human needs, education, etc. (including the construction of hospitals, schools and roads, or the procurement of materials and equipment for public transport vehicles, etc.)

Grant Aid for Disaster Prevention and Reconstruction: Disaster prevention assistance and post-disaster reconstruction assistance

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JICA program: Technical Cooperation Projects

- **Dispatch of Experts**: Japanese experts are dispatched to developing countries to disseminate necessary technologies and knowledge to partner country government officials and engineers (counterparts). At the same time, they cooperate with these counterparts in developing and spreading technologies and institutions suited to the conditions in those countries as well as conducting awareness-raising activities
- **Acceptance of Training Participants**: JICA invites competent personnel in developing countries, who have significant responsibility in social and economic development, to Japan as training participants. They participate in training programs in Japan and obtain knowledge and technologies needed in their home countries.
- **Provision of Equipment**: Equipment needed by experts for implementing effective cooperation is provided to partner countries.

JICA program: Technical Cooperation Projects

- **Technical Cooperation Projects**: Technical Cooperation projects, which optimally combine the "Dispatch of Experts," "Acceptance of Training Participants" and/or "Provision of Equipment" are the core operations of JICA's Technical Cooperation. Even more reliable project outcomes can be obtained through systematic and comprehensive project operation and implementation from planning to implementation and evaluation.

JICA program: Technical Cooperation Projects

Technical Cooperation for Development Planning: While supporting developing countries' policymaking and public works plans, JICA transfers technologies, including survey/analysis methods and planning methods to counterparts in the partner country. The following four features are the main contents of cooperation.

Master plans (M/P) and policy support studies (fiscal reforms, establishment of legal systems, etc.) to support policymaking and the planning of public projects

Emergency support studies (rehabilitation and reconstruction of basic infrastructure that has been damaged by natural disasters, conflicts or other factors)

Feasibility studies (F/S) for projects which will be realized by the developing country governments or other donor

Other studies (topographic mapping, groundwater surveys, etc.)

JICA program: Countermeasures towards Global Issues through Science and Technology Research Partnership (SATREPS)

- JICA starts the projects in cooperation with Japan Science and Technology Agency (JST), after the conclusion of international agreements with governments of the partner countries
- This program aspires to acquire new knowledge which may become the key to tackle global issues, like environment/energy, bio resources, natural disaster prevention and infectious diseases control, and also aspires to encourage the future use of acquired knowledge in society. The program aims at the human resource development and capacity-building of researchers and research institutes in developing countries through science and technology joint research cooperation with research institutes in Japan based on social needs in developing countries.
- This is a joint program with JICA and JST. JICA will support project implementations in partner countries in cooperation with the research institutes in Japan. JST will support the research institutes for the project activities and expenses occurred in Japan.
- Project list
http://www.jst.go.jp/global/english/kadai/index.html#environment_energy

① Indonesia : Lumut Balai Geothermal Power Plant Project

Under this Climate Change ODA Loan project, a geothermal power plant will be constructed in South Sumatra Province and connected to the Sumatra power grid. This will improve the stability of power supply and the lives of residents, contributing to the promotion of economic development and the use of renewable energy in the Sumatra region. JICA also implements study for Indonesia' s policy reform to promote private enterprises to take part in developing abundant geothermal energy.

Loan

Photo : West Japan Engineering Consultants, Inc.

② Thailand : Mass Transit System Project in Bangkok

In Bangkok, traffic congestion and following air pollution have been serious problems. This project aims to shift traffic from road to railway by providing public rail transit network, easing traffic congestion and cutting greenhouse gas emissions. JICA also supports the capacity building on climate change adaptation and mitigation for implementation in the Bangkok Metropolis.

Loan

③ Algeria : Sahara Solar Energy Research Center (SSERC) (SATREPS)

It is essential to cope with the increasing energy demand in developing countries considering the exhausting fossil fuels and the climate change.

The targets in this project are as follows : exploration of technology to utilize the Sahara desert as a new energy resource of siliconand solar power , breeder construction of silicon and photovoltaic power plant and their effective utilization, feasibility studies on PV power transmission across the desert.

④ Tanzania : Iringa-Shinyanga Power Transmission Line Project ODA Loan

In recent years, the demand for power has rapidly increased in the northern part of Tanzania such as Shinyanga Region, while power comes mainly from hydroelectric sources in the south. This project improves transmission capacity there and Will decrease transmission losses to enable more efficient power use, which will help curb greenhouse gas emissions, enabling this project to qualify as a Climate Change ODA Loan* .

Loan

⑤Brazil：Belem Metropolitan Trunk Bus System Project

In Belem metropolitan area, there are about two hundred people, and the traffic congestion is serious problem. This project aims to ease such problem, while

also alleviating air pollution and curbing green house gas emissions , establishing bus transportation system which includes construction of byways such as trunk roads, exclusive bus lanes and bus terminals.

Loan

⑥ Basic Training for Introduction of Solar Power

Introducing new technologies to administrative officials and engineers from developing countries through training in Japan

Basic Training for Introduction of Solar Power (Feb 2010～)
Training through Pacific Resource Exchange Center (PREX) at firms in Japan including:
The Kansai Electric Power Co., Inc. / SHARP Corporation / SANYO Electric Co., Ltd. / Kaneka Corporation / KYOCERA Corporation / Osaka Gas Co., Ltd.

Laos: Example of installation of solar power panel

- Countries of participants to the training program (expected for Jan - Mar 2011 session)
  Africa: Ethiopia, Burkina Faso, Djibouti, Mali, Senegal, Botswana, Lesotho, Malawi, Namibia, Tanzania, Nigeria, Burundi
  Asia: Timor-Leste, Cambodia, Laos, Azerbaijan, Afghanistan
- Expected outcomes through this training program
  1) Promoting introduction of Japanese solar power / technologies through presentation during training
  2) Promoting formulation of solar power projects financed by grant and loan aid of JICA
  3) Promoting technical cooperation including dispatch of experts for establishing standards, institutions and policies related to solar power

Technical Assistance

Mitigation and Adaptation

⑦ Philippines：Forest Management Project

Forest area in the Philippines continues to decline at the rate of more than 2% a year in recent years, resulting in reduction of the carbon absorption capacity. Furthermore, the devastation of forests causes reduced runoff and water-holding capacity of soil, thereby increasing the risk of natural disasters such as droughts or floods. This project is aimed at strengthening forestland management through implementing

community based fore's management in Luzon and Panay, thereby improving forest conservation, which is expected to reduce greenhouse gas emission, and socio-economic conditions of residents, and contributing to disaster risk mitigation in vulnerable area.

REDD+

⑧ Cameroon：Establishment of Sustainable Livelihood Strategies and Natural Resource Management in Tropical Rain Forest and its Surrounding Areas : Integrating the Global Environmental Concerns with Local Livelihood Needs

The Congo Basin forest is an important storage place of carbon and biological diversity, and indigenous people rely upon the forest for fuel, food, medicine, and so on. In order to ensure forest conservation as well as a better life for indigenous

people, this project aims to introduce sustainable agricultural systems, ensure sustainable use of the forest, and establish ecological resource management, thus contributing to these people's capacity for forest conservation.

REDD+ SATREPS

⑨ Papua New Guinea：Capacity Development on Forest Resource Monitoring for Addressing Climate Change

Papua New Guinea (PNG) is a country with one of the largest rainforest in the world, but the deterioration and decline of forest resources due to unsustainable logging and land conversion have become major problems. This project is intended to preserve and manage forests in PNG sustainably as part of adaptation

and mitigation to climate change. The development of satellite images and GIS system along with capacity building is enforced so that the ability to implement monitoring of forest resources including carbon stocks enhances.

REDD+

Technical Training in Japan on Climate Change Mitigation Actions
under JICA Technical Cooperation Project
"Capacity Development Project on Nationally Appropriate Mitigation Actions (NAMAs)
in the Republic of Serbia"

Lecture at Agency for Natural Resources and Energy, Ministry of Economy, Trade and Industry

Agenda

- Date and time: 2:00pm - 4:00pm, Wednesday, 31 October, 2012
- Venue: 526 Conference Room, 5th floor of Annex Building of Ministry of Economy, Trade and Industry

*Consecutive Japanese-Serbian verbal interpretation is provided for each of following parts.

1. **Opening remarks**…… 5 minutes

   - Greeting and explanation on the objectives of the training
   - Introduction of trainees

2. **Lecture**…… 70 minutes

   "Japan's Policy on Energy Conservation and Renewable Energies"

   By Mr. Toshiaki Nagata
   International Affairs Office, Energy Conservation and Renewable Energy Department, Agency for Natural Resources and Energy

3. **Questions and answers, exchange of opinions**…… 45 minutes

Serbia
October 31, 2012

Japan's Policy on Energy Conservation and Renewable Energies

Toshiaki Nagata

International Affairs Office,
Energy Conservation and Renewable Energy Dept.
Agency for Natural Resources and Energy

Innovative Strategy for Energy and the Environment

- Issued on September 14, 2012

- Aimed at creating new energy society with collective efforts of every single nation in Japan

- Consists of three key elements:
  (a) Realization of a society not dependent on nuclear power with 3 guiding principles and 5 policies
  (b) Realization of green energy revolution
  (c) Ensuring stable supply of energy

-The three key elements to be backed up by the bold implementation of electricity system reform

-Global warming countermeasures to continue to be steadily implemented

Innovative Strategy for Energy and the Environment

Realization of green energy revolution

○Path to the electricity & energy saving in FY 2030

Electricity and energy saving	2010	2015	2020	2030
Power generation (TWh)	1,100	-25 (-2%)	-50 (-5%)	-110 (-10%)
Total final consumption (G Litter)	390	-16 (-4%)	-31 (-8%)	-72 (-19%)

% = compare to 2010

○Path to the renewable energy use in 2030

Renewable energy	2010	2015	2020	2030
Power generation (TWh)	110	140 (1.4 times)	180 (1.7 times)	300 (3 times)
Capacity (GW)	31	48	70	132
Power generation (TWh) (excluding hydro)	25	50 (2 times)	80 (3 times)	190 (8 times)

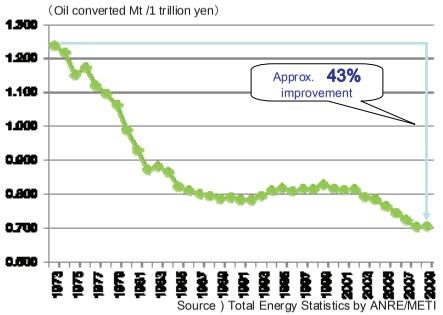
X times compared to 2010

Energy Efficiency

Energy Conservation Efforts of Japan after Oil Crises

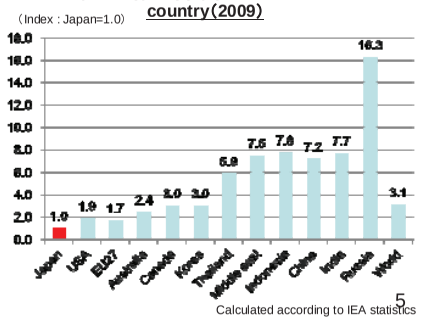
- Japan has been improved energy efficiency by about 40% after the oil crises since 1970s as a result of positive action by both public and private industrial sectors.
- Japan intensively introduced "Energy Management system based on Energy conservation law", then realized the lowest energy consumption per GDP.

Primary energy use per real GDP of Japan



Source) Total Energy Statistics by ANRE/METI

Primary energy supply per GDP unit of each country(2009)



Calculated according to IEA statistics

Japan's Energy Efficiency Policy

1. Regulation

Energy Conservation Law : Enacted in 1979

→ Upgraded and improved several times responding to social needs

2. Promotion

- Tax incentives
- Subsidies (including for R&D)
- Preferential interest rate

3. Voluntary action (by private sector)

Historical Development of Energy Conservation Law

Industry | **Residential Commercial** | **Transportation**

1947 Establishment of heat management

1979 Establishment
●Designated Energy Management Factories Guidance for Buildings and Appliances

Effective use of electric power and fuel in industrial sector

Promote energy efficiency of automobiles and household electrical appliances

1983 Amendment
●Licensed energy manager system

1993 Amendment
●Periodical reporting

1998 Amendment
●Expand coverage of factories

1998 Amendment
●**Top Runner Program** for automobiles and household electrical appliances

2002 Amendment
●Energy Management of Office Buildings

2005 Amendment
●Integration of Heat and Power Control

2005 Amendment
●Reporting System on Energy by Carriers

2008 Amendment
●Company based regulation include franchised chains

2012 Amendment
●Measures on demand side at peak demand hours
●Top Runner Program for Building Materials etc.

Japan's Energy Efficiency Policy

<Regulations>

A. Factories/Offices

- 1% continuous efficiency improvement on annual average
- Energy Management System
- Energy Managers energy-saving experts to be assigned.
- Reporting of Energy Consumption to the Gov.

Japan's Energy Efficiency Policy

<Regulations>

B. Transportation

- Carriers, Consigners
- Promoting higher fuel efficiency standard by "Top Runner" program

ex. Diesel Truck (km/l)

21.7% improvement
(FY1995→FY2005)

Japan's Energy Efficiency Policy

<Regulations>

C. Houses/Buildings

- Ensuring the energy efficiency through mandatory report by:
  - Constructions: measures on energy conservation for newly constructed houses/buildings
  - Owners: measures on preservation/maintenance

  (applied for houses/buildings with total floor space more than 300m²)
- Requiring 10% efficiency improvement to House Suppliers on total energy consumption of new residential houses (by 2013FY)

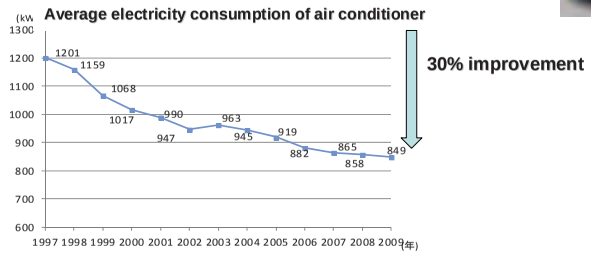
Japan's Energy Efficiency Policy

<Regulations>

D. Automobiles/Electronic Appliances

- "Top Runner" Program

  Target products : 23 products



SETSUDEN (power saving) Campaign, Summer 2011

(1) **Large users (contract electricity > 500 kW)**
- Every large user to map out and implement their own plan
- Mandatory demand restriction by the Electricity Business Act (Art 27)

(2) **Small users (contract electricity < 500 kW)**
- To map out specific targets and voluntary plans according to the business type
- The government conducted awareness campaigns and individual visits using "Standard Format for Action Plan of Electricity Saving"

(3) **Households and individuals**
- Government provided "Menu of Electricity Saving Measures by Households"
- "Electricity Saving Manifesto by Households" on the website prepared by the government
- Promote energy saving through education

(4) **Nation-wide activities**
- Providing electricity supply-demand forecast.
- "Tight Supply-Demand Alert" and announcement of the possibility of rolling blackout – announce to individual cell-phone

Ad on newspaper

Standard Format for Action Plan

Menu of Electricity Saving by Households

Electricity Saving Manifesto by Households

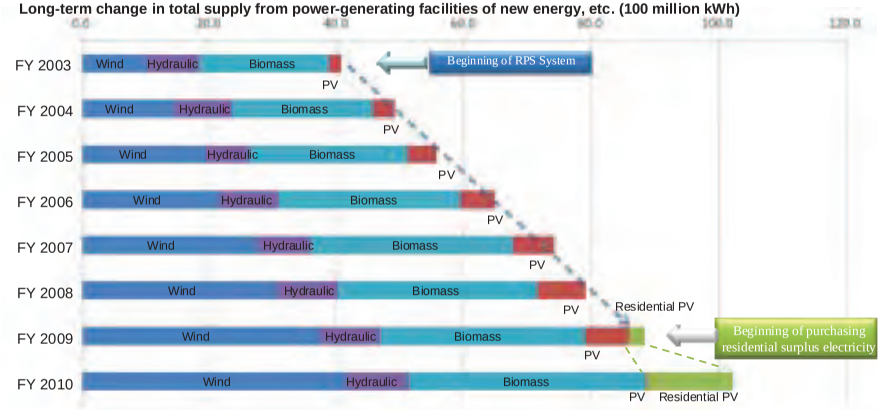
Electricity demand forecast

Renewable Energies

Changes in Electric Power Supply by Renewable Energy

- Since the introduction of the RPS system in 2003, electric power supply by renewable energy has doubled.
- Moreover, since the surplus electricity purchase system was introduced in 2009, the introduction of residential photovoltaic power generation has largely increased.

Long-term change in total supply from power-generating facilities of new energy, etc. (100 million kWh)

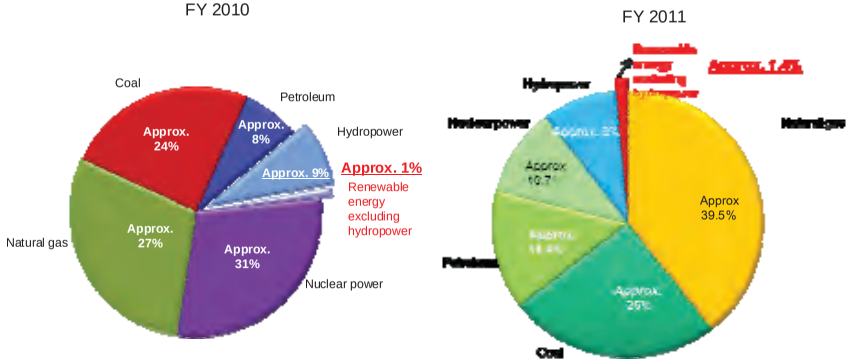


1) This data shows electricity supply from facilities accredited by the RPS Law. Electric energy before the RPS Law was enacted, electric energy generated by facilities that are not currently accredited by the RPS Law, and electric energy that is generated by facilities accredited by the RPS Law and consumed in-house are not included in this data.
2) Photovoltaic facilities that have been covered by the surplus electricity purchase system since November 2009 are calculated as specific PV.

Current Composition of Power Sources in Japan

- Among the total electricity generated in fiscal 2010, renewable energy, etc. accounted for approximately 10%; approximately 9% of which is hydraulic power generation.
- Other renewable energy is still cost prohibitive.

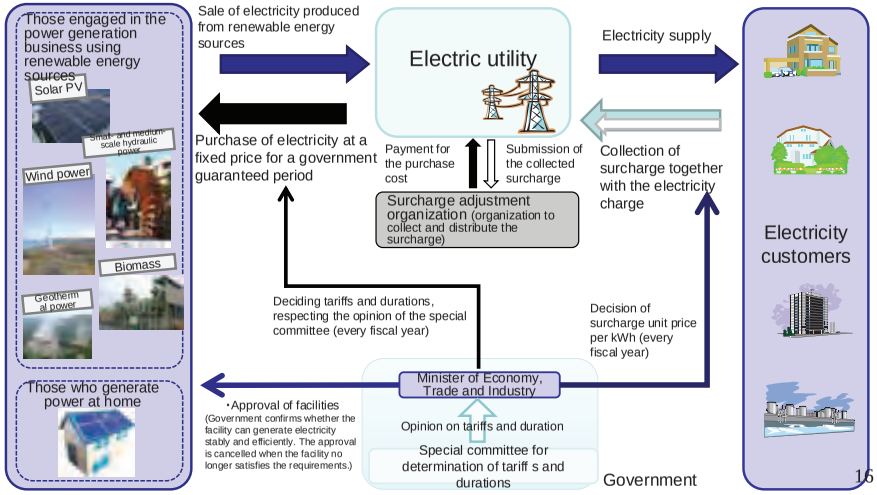
Composition of annual electricity generated in Japan



Note: "Etc." of "Renewable energy, etc." includes the recovery of energy derived from waste, refuse derived fuel (RDF) products, heat supply utilizing waste heat, industrial steam recovery, and industrial electricity recovery.
Source: Prepared based on the Agency for Natural Resources and Energy's "Outline of Electric Power Development in FY 2010"

Basic Mechanism of the Feed-in Tariff Scheme

- Under the feed-in tariff scheme, if a renewable energy producer requests an electric utility to sign a contract to purchase electricity at a fixed price and for a long-term period guaranteed by the government, the electric utility is obligated to accept this request.



Renewable Energy Forecast (FY2012)

■ Estimating based on officially announced projects and recent trend, approximately 2.5GW renewable energy facilities would be installed in this fiscal year.（Currently about 19.45GW renewable capacity expects to increase to about 22GW.)

＜Renewable energy installation forecast in FY 2012＞

	Already installed capacity by FY2011	Forecast of newly installed capacity in FY2012
Residential PV	Approx. 4GW	+ Approx 1.5GW (40% increase from new installation in 2011)
Non-Residential PV	Approx. 0.8GW	+Approx 0.5GW (Estimate by METI)
Wind	Approx. 2.5GW	+Approx 0.38GW (50 % increase from recent annual installation)
Small and Medium scaled hydro (1MW to 3MW)	Approx. 9.35GW	+Approx 0.02GW (Estimate by METI)
Small and Medium scaled hydro (Less than 1MW)	Approx. 0.2GW	+Approx 0.01GW (50 % increase from recent annual installation)
Biomass	Approx. 2.1GW	+Approx 0.09GW (50 % increase from recent annual installation)
Geothermal	Approx. 0.5GW	+0GW
Total	Approx. 19.45GW	+Approx 2.5GW

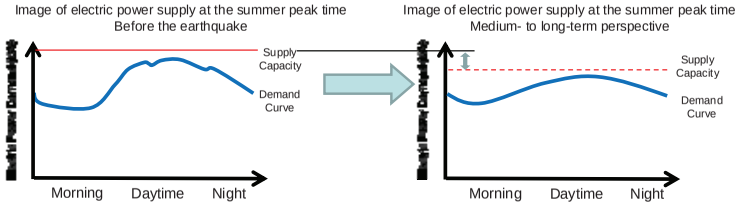
Smart Communities

Change after the Great earthquake

- In the wake of the Great East Japan Earthquake and the subsequent nuclear accident in March last year, electric power supply and demand has been tight with all the domestic nuclear power stations shut down.
- The government embarked last November on its study aimed at stepping up energy conservation measures.

Need for Measures against Peak Demand Reduction

◆Successful development of our economy will hinge on the energy supply and demand situation stabilizing as early as possible. All necessary steps should be taken to improve our energy supply system.
◆The demand side as well should take measures to facilitate peak demand reduction of electric power in ways that help to effectively use storage batteries and energy management systems that are becoming widespread.



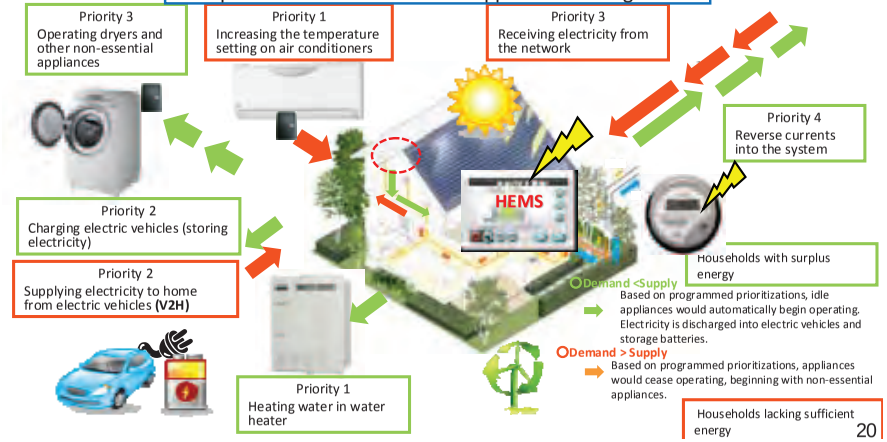
Enhanced Energy Conservation Measures in Consumer Sector

◆Necessary measures should be taken immediately in the consumer sector (houses and buildings) where energy consumption is growing at a rapid pace due to the increase in floor area and the number of households.
◆The measures to reduce electric energy consumption in the last summer relied much on forced energy saving on the business and household sides. It is important in the future to drive sustainable efforts in the consumer sector in reducing energy consumption by making use of high-efficiency houses, buildings and other equipment.

Smart Houses

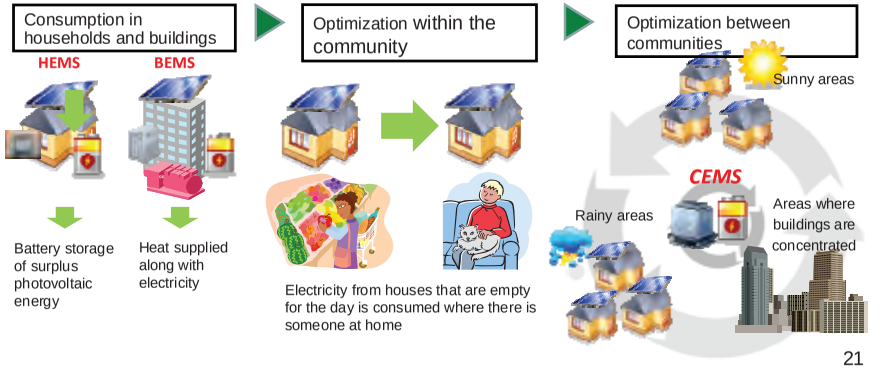
- In Japan, households account for a high percentage of solar power generation (82% as of 2010)
- Houses with solar panels are places where power is generated through renewable sources and used. These houses are potentially developable into smart houses—the smallest unit of smart communities which produce and consume their own energy.
  - Real time grasp of power usage and automatic control of appliances through smart meters and HEMS (home energy management systems).
  - Storage of electricity in household storage batteries and electric vehicles; discharge of such electricity (V2H).

Examples of automatic control of appliances through HEMS

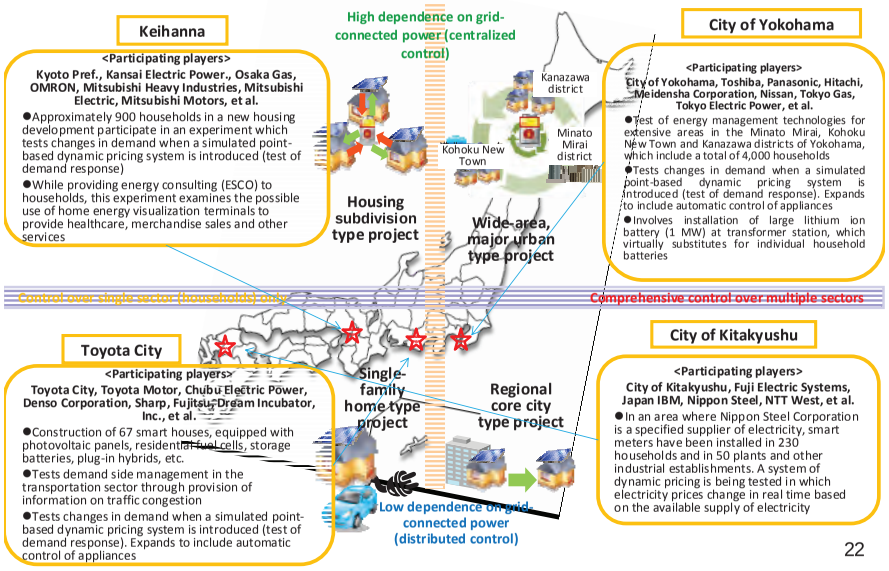


Managing a Community's Energy Use

- Energy management need not be limited to the level of individual households, through use of HEMS, or to the level of individual buildings, through use of BEMS ("building energy management systems"); energy consumption can also be managed more efficiently for multiple households and buildings through use of community energy management systems (CEMS).
- For example, on a clear day, when photovoltaic systems are generating electricity efficiently, a system could move surplus energy from houses where no one is in to other houses where there is someone home. If systems could be designed in this way, it would make it unnecessary for every house to have a storage battery and make it viable to operate with one battery per multiple households, thus lowering costs.
- Energy could also be used more efficiently by combining users with different patterns of consumption—typically households, which use large amounts of energy in the mornings and evenings, and buildings, whose energy demand is high during the day.



Test Projects for Next-generation Energy and Social Systems



International Cooperation

Cooperation on energy conservation

Purpose

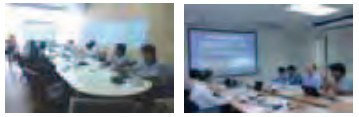
To share with other countries Japan's experience of overcoming the "oil-crises" with advanced energy efficiency (EE) policies and technologies, through:

1. **Cooperation on EE policies**
   To assist other countries in designing their EE policies and measures through such activities as capacity building and joint policy research, on the basis of Japanese policies and measures

2. **Cooperation on EE technologies**
   To assist other countries in developing and utilizing EE technologies through such activities as joint demonstration projects, on the basis of Japanese technologies

Example of policy cooperation:

Assistance for establishment of EE measures



Cooperation with Malaysia
- ✓EE measures being discussed with energy authority staff from Malaysia
- ✓Japanese legislation, regulations, measures, etc. being introduced and studied

Example of technology cooperation

Waste heat power generation at a cement plant

Demonstration at a cement plant in China
- ✓Waste heat power generation technology was demonstrated in 1995 - 1997
- ✓The technology has been wide spread in the country after the completion of the demonstration

Cooperation on renewable energies

Purpose

To assist introduction of renewable energies (RE) worldwide, taking advantage of Japan's strength on the energy demand-supply management, through:

1. Cooperation on RE policies
To establish environments to facilitate introduction of RE worldwide through such activities as capacity building

2. Cooperation on RE technologies
To assist other countries in developing and utilizing RE technologies through such activities as joint demonstration projects, on the basis of Japanese technologies on, *inter alia*, PV and energy management

Example of policy cooperation

Assistance for establishment of RE measures


Cooperation with the Philippines
✓RE measures being discussed with energy authority staff from the Philippines
✓Japanese measures to promote RE being introduced and studies

Example of technology cooperation

Large scale PV system


Demonstration at an industrial park in India
✓A stable power supply system using PVs is being demonstrated for the period 2012 – 2014
✓The agreement to start the project was signed in front of ministers from India and Japan, which highlighted commitments of the two Gov'ts.

Multilateral cooperation（IPEEC及びIRENA）

Purpose

To promote energy efficiency improvements and use of renewable energies at a global scale through active contribution to multilateral initiatives, such as IPEEC (International Partnership for Energy Efficiency Cooperation) and IRENA (International Renewable Energy Agency)

Multilateral initiative for energy efficiency

IPEEC (International Partnership for Energy Efficiency Cooperation)

✓To facilitate participating countries' voluntary efforts on energy efficiency improvements through information sharing
✓Established in 2009, with participation of Japan, the US, China, India and others, headquatered in Paris
✓8 WGs are established and in active operation

Multilateral initiative for renewable energies

IRENA (International Renewable Energy Agency)

✓To facilitate the use of renewable energies through policy analysis, establishment of research network, etc.
✓Established in 2011 with participation of 98 countries, headquatered in Abu Dhabi
✓Japan has been acting as one of the Executive Members

Thank you very much!
ありがとうございます！

Questions?

Technical Training in Japan on Climate Change Mitigation Actions
under JICA Technical Cooperation Project
"Capacity Development Project on Nationally Appropriate Mitigation Actions (NAMAs)
in the Republic of Serbia"

Lecture by Energy Conservation Center Japan

Agenda

- Date and time: 10:00am - 12:00am, Thursday, 1 November, 2012
- Venue: Seminar Room No. 19, JICA Tokyo International Center

*Consecutive Japanese-Serbian verbal interpretation is provided for each of following parts.

1. **Opening remarks**…… 5 minutes

- Greeting
- Introduction of trainees (by facilitator)

2. **Lecture**…….. 90 minutes

"Promotion Activities of Energy Conservation in Japan"

By Mr. Hiroshi Kawamura
Training Cooperation Department, International Cooperation Division,
The Energy Conservation Center, Japan

3. **Questions and answers**…….. 25 minutes

Technical Training in Japan on Climate Change Mitigation Actions
under JICA Technical Cooperation Project
"Capacity Development Project on Nationally Appropriate Mitigation Actions (NAMAs)
in the Republic of Serbia"

Lecture by Ministry of Land, Infrastructure, Transport and Tourism

Agenda

- Date and time: 2:00pm - 5:30pm , Thursday, 1 November, 2012
- Venue: Seminar Room No. 19, JICA Tokyo International Center

* Consecutive Japanese-Serbian verbal interpretation is provided for each of following parts.

1. Opening remarks…… 5 minutes

- Greeting
- Introduction of trainees (by facilitator)

2. Lecture I…… 90 minutes

"Efforts of the Ministry of Land, Infrastructure, Transport and Tourism to Reduce Greenhouse Gas Emissions in the Transport Sector"
By. Mr. Taro Tokai
Chief, Environmental Policy Division, Policy Bureau,
Ministry of Land, Infrastructure, Transport and Tourism

"Initiatives for Development of Low Carbon City in Japan"
By. Mr. Yuji Tsutsui
Senior Deputy Director, City Planning Division, City Bureau,
Ministry of Land, Infrastructure, Transport and Tourism

*Around 45 minutes for each topic.

3. Questions and answers on Lecture I…….. 20 minutes

4. Break…… 10 minutes

5. Lecture II…….. 45 minutes

"Environmental Measures for Housing and Buildings"
By. Kenji Kimura
Chief, Housing Bureau, Ministry of Land, Infrastructure, Transport and Tourism

6. Questions and answers on Lecture II, and exchange of opinions…….. 40 minutes

- Questions and answers on the contents of Lecture II
- Exchange of opinions

Efforts of the Ministry of Land, Infrastructure, Transport and Tourism to Reduce Greenhouse Gas Emissions in the Transport Sector

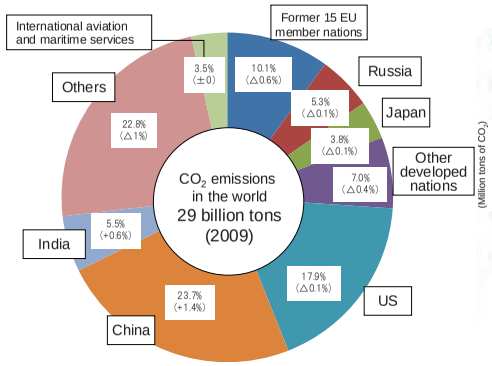
Environmental Policy Division,
Policy Bureau,
Ministry of Land, Infrastructure, Transport and Tourism
November 1, 2012

国土交通省
Ministry of Land, Infrastructure, Transport and Tourism

Contents of the presentation

CO_2 emissions in the world

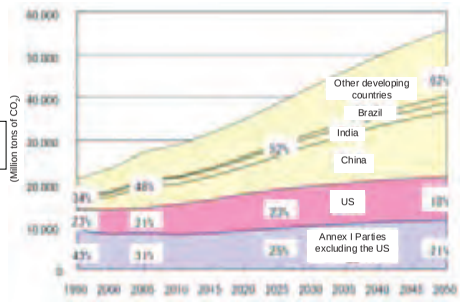
Share of energy-derived CO_2 emissions by country (2009)



*The values shown in parentheses indicate increment/decrement expressed in percentage from the year 2008.

*15 EU countries are member countries of EU at the time of COP3 held in Kyoto.
Source: Prepared by the Ministry of the Environment based on the "KEY WORLD ENERGY STATISTICS" (IEA 2011)

Prospects of CO_2 emissions in the world

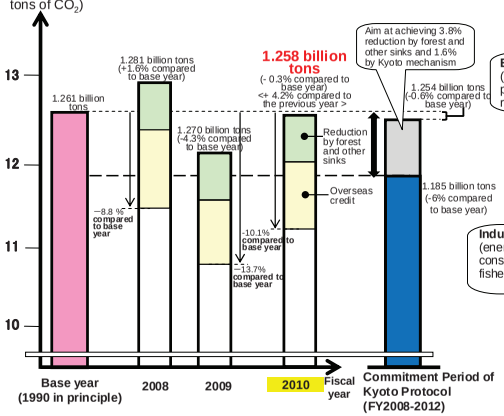


Source: Research Institute of Innovative Technology for the Earth (RITE)

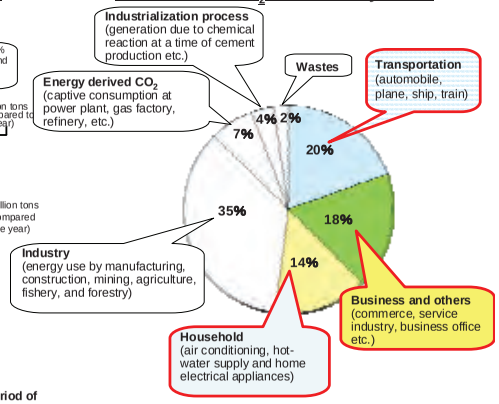
Status of greenhouse gas emissions in Japan (definite value in 2010)

GHG emission in Japan in 2010 was: 4.2% higher than the previous year; 0.3% lower than the base year; and 10.1% lower than the base year when the reduction by forest and other sinks*1 and by earning overseas credits*2 were both taken into account.

Status of greenhouse gas emissions in Japan



Breakdown of CO_2 emissions by sector

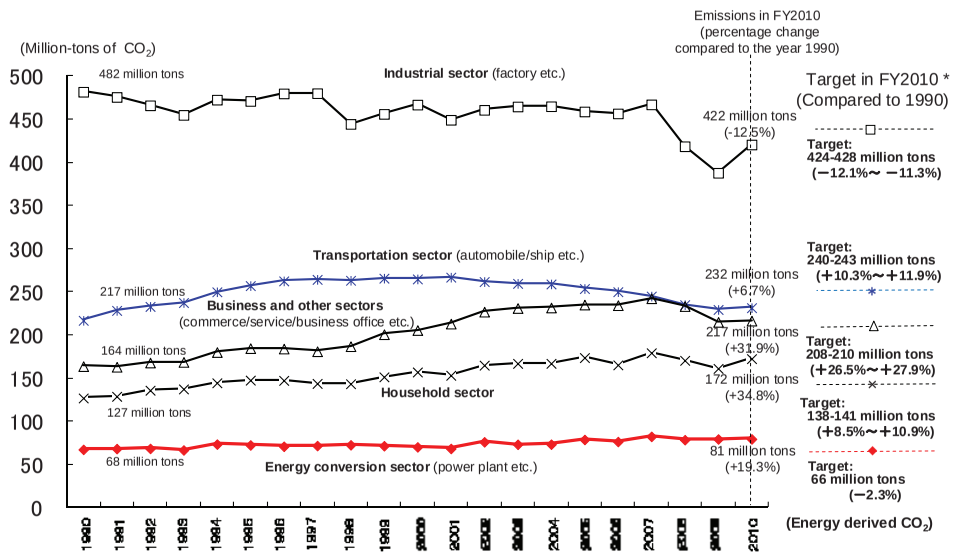


1.192 billion tons in total (CO_2)

(includes both energy- and non-energy-derived CO2 emissions)

*1 Set at 3.8% which is the level of reduction aimed to be achieved by using forest and other sinks.
*2 Have taken into account: the credits that the government had acquired; and those transferred to the government account from the private sector.

Trend and target of greenhouse gas emissions by sector

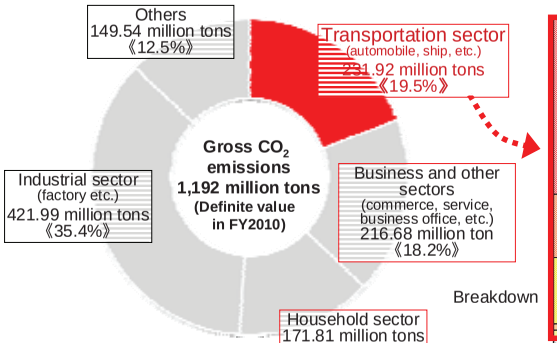


*Target values in FY2010 are derived from the upper case of the Kyoto Protocol Target Achievement Plan (cabinet decision on March 28, 2008)

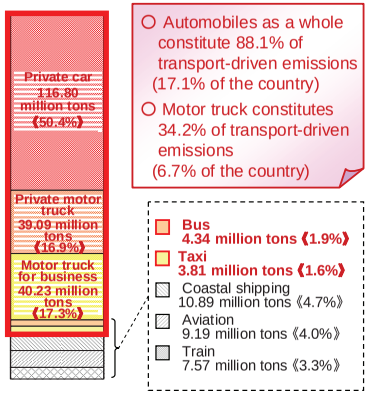
CO_2 emissions from the transportation sector in Japan

- CO_2 emissions from the **transportation sector constitute 20%** of the total emissions in Japan.
- **Automobiles** and **motor trucks** account for **88.1% (17.1%)** and **34.2% (6.7%)** of **transport-driven CO2 emissions (total CO2 emissions)** in the country, respectively.

CO_2 emissions in Japan by sector



CO_2 emissions from the transportation sector

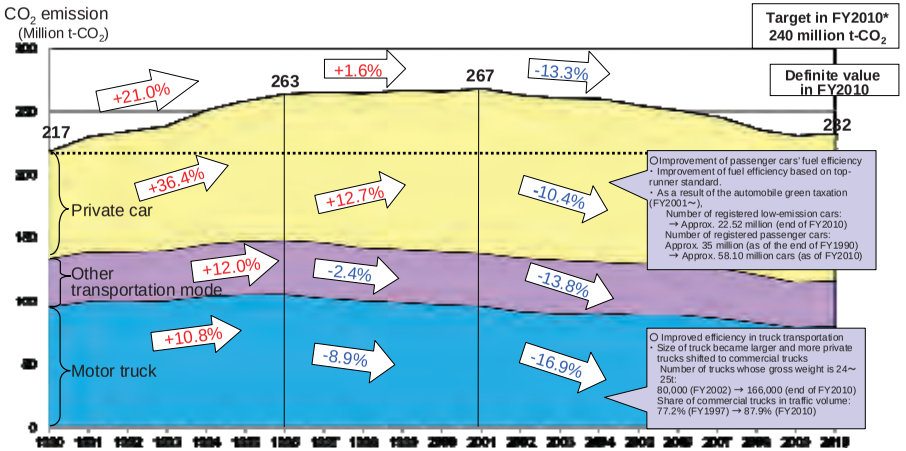


- Automobiles as a whole constitute 88.1% of transport-driven emissions (17.1% of the country)
- Motor truck constitutes 34.2% of transport-driven emissions (6.7% of the country)

*Emissions that derive from power companies' electricity generation and heat suppliers' heat generation are allocated to the final demand based on their level of consumption.
*Prepared by the Environmental Policy Division of MLIT based on the "National Greenhouse Gas Inventory Report of Japan" of the Greenhouse Gas Inventory Office of Japan

CO_2 emissions in the transportation sector

- After reaching its peak in FY2001, emissions from the transportation sector have shown a decline
- Emissions from motor trucks and private cars have started to decline since FY1996 and FY2001, respectively



Other transportation facilities: bus, taxi, train, ship and aviation

*Target values in FY2010 are derived from the upper case of the Kyoto Protocol Target Achievement Plan (cabinet decision on March 28, 2008)

Promotion of measures against global warming

Background of considering post-2013 measures against global warming

Before the Earthquake

✓Based on the Kyoto Protocol Target Achievement Plan (established in 2005 and revised in 2008), promote measures against global warming to achieve the commitment made in the Kyoto Protocol (i.e. greenhouse gas reduction by 6% on average from the 1990 level between 2008 and 2012)
✓The Kyoto Protocol Target Achievement Plan expired in 2012

International trends

Trends of international negotiations (COP) towards the establishment of an international framework and agreement after 2013

✓In COP 17 (held in South Africa in 2011), we have made it clear not to take part in the second commitment period of the Kyoto Protocol. We intend to proceed with voluntary reduction efforts.
✓Concerning the "Future Legislative Framework applicable to All Countries", our target to achieve, we have agreed to the roadmap of completing the discussions as soon as possible during 2015 at the latest, and of making the framework effective and implementing it from 2020.

Domestic trends

Diet bill of the Basic Law on Measures against Global Warming, which establishes the medium- to long-term targets (25% reduction by 2020 and 80% reduction by 2050) and measures against global warming (under deliberation)*

Great East Japan Earthquake and nuclear accident

Movement towards drastic review of energy and environmental policies

*The Basic Law on Measures to Tackle Global Warming was approved by the cabinet, put before the 176th extraordinary session of the Diet, and is currently under deliberation.

Review of energy and environmental policies Review system within the government as a whole

National Strategic Council
Dec. 22 2011 Formulated "Strategy for Rebirth of Japan"
July 31 2012 Formulated "Comprehensive Strategy for the Rebirth of Japan"

Energy and Environmental Council

On the basis of this policy, the Atomic Energy Commission, Advisory Committee on Energy and Natural Resources, and Central Environment Council will develop drafts for the options of nuclear power policy, energy mix, and measures against global warming.

June 29 2012: Presentation of options for energy and the environment
July: Development of nationwide discussions
Sept. 14: Establishment of the "Innovative Strategy for Energy and the Environment"
As soon as possible: Development of the Energy Basic Plan
Within this year: Development of measures against global warming, outline of nuclear power policies, and outline of green policies

Advisory Committee on Energy and Natural Resources	Central Environment Council	Atomic Energy Commission
- Draft development for options of energy mix - New Energy Basic Plan	- Draft development for options of measures against global warming - New measures against global warming	- Draft development for options of nuclear power policies - New outline of nuclear power policies

Interim compilation of discussion points for the mid-term measures against global warming, MLIT (outline)

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Efficient and effective promotion of the measures against global warming while making the best of the collective strength and integrating force, the superior features of MLIT; the aim being establishment of the low-carbon circulation type system and creation of the sustainable active land and regions

Three viewpoints of the measures against mid-term global warming by MLIT

Creating low-carbon urban area appropriate to the local/regional characteristics

- Efforts will be made to present the roadmap and measures for carbon reduction, with the aim at their nationwide development by approaching creation, change, and energy conservation of urban areas and transport as a whole via the model project and support means. This is to ensure development of measures against global warming appropriate to regional characteristics and the uniqueness of the area in terms of socio-economic structures and living styles.

Response to energy restrictions and establishment of an appropriate energy system for Japan after the Great East Japan Earthquake

- In the case of impending energy demand/supply, realization of the low-carbon society was highly anticipated.
- Priority-based approach to three fields: energy conservation, renewable energy, and energy・environment industries; medium- to long-term target is establishment of the desirable energy system.

Measures against global warming taking into account changes in life- and work-style

- With the aim at conversion from the mass consumption type society to the resource saving society, environment-oriented selection in the course of consumption behavior of the people and enterprises' production activities will be promoted.
- In this event, efforts will be made to enable coexistence of the amenity, convenience, and intellectual productivity with the environment.

* Environment Group, Traffic System Subcommittee of Traffic Policy Council, Social Capital Development Council, Ministry of Land, Infrastructure, Transport and Tourism (HP: http://www.mlit.go.jp/policy/shingikai/s303_kankyo01.html)

Interim compilation of discussion points for the mid-term measures against global warming, MLIT (measures and policies)

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MLIT, not only dealing with measures and policies individually, but also demonstrating comprehensive and integrating forces to develop policies combined by crossing over boundaries of sectors and divisions

1. **Promoting the development and dissemination of environmentally-friendly vehicles**
   Development of ambitious fuel efficiency standards, promotion of the development and practical application of next-generation large vehicles, and further dissemination of environmentally-friendly vehicles
2. **Promoting optimum utilization of vehicles**
   Use of vehicles with less impact on the environment, promotion of mechanisms that enhance carriers' environmental efforts, city planning based on environmentally-friendly vehicles, integrated energy management for vehicles and households
3. **Ensuring smooth traffic flow**
4. **Heightening efficiency in logistical distribution**
   Modal shift, utilization of the Conference on Green Physical Distribution Partnership, promotion of zero-emission port policies, use of green management certification system, improvement in truck transport efficiency
5. **Promoting the use of public transportation**
   Greater convenience in railway and bus transportation, eco-conscious commutation
6. **Improving energy use efficiency in railway, shipping, and aviation**
7. **Energy conservation measures for housing and building**
   Promotion of zero energy use in schools and houses, technical support for medium to small contractors, better evaluation and marking of energy conservation performance, promotion of energy conservation measures for existing stocks
8. **Promoting low-carbon urban planning**
   Intensified urban structuring, promotion of non-point use of energy
9. **Measures concerning the sewage system**
   Utilization of sewage sludge biogas for fuel, utilization of sewage heat, energy conservation measures in sewage system, greenhouse gas reduction from sewage sludge incineration facilities
10. **Efforts of public facilities**
    Advanced zero energy measures in public facilities and introduction of photovoltaic power generation facilities
11. **Development, dissemination and promotion of new energies and technologies**
    Promotion of wind power generation on the ocean
12. **Measures concerning greenhouse gas sink**
    Promotion of urban planting
13. **Other measures to reduce greenhouse gas emissions**
    Dissemination of low-fuel efficiency and low-carbon construction machineries in the construction industry, low-carbon land formation targeting a wide area, promotion of researches on climate change, reinforcement of observation and monitoring systems, promotion of international cooperation, etc.

Environment Group, Traffic System Subcommittee of Traffic Policy Council, Social Capital Development Council, Ministry of Land, Infrastructure, Transport and Tourism (HP: http://www.mlit.go.jp/policy/shingikai/s303_kankyo01.html)

Promotion of development and dissemination of environmentally-friendly vehicles

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The principal measure in the automobile sector, which accounts for approx. 20% of the total CO_2 emissions in Japan, is to improve environmental performance of new vehicles.
- Setting future development targets through development of ambitious fuel efficiency standards
- Tax incentives and subsidies based on their environmental performance

⇒ Promotion of development and dissemination of environmentally-friendly vehicles

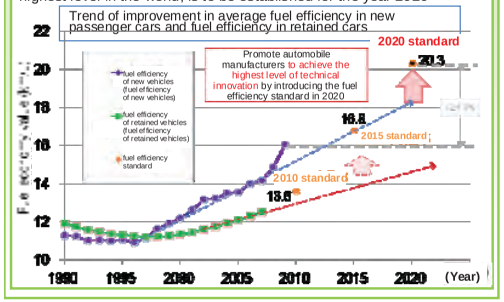
Development of fuel efficiency standards

■Development of ambitious standards

Setting future development targets, which will be reviewed as necessary.

○Fuel efficiency standard for heavy vehicles established for the first time in the world in 2006

○ Fuel efficiency standard for passenger cars, considered to be the highest level in the world, is to be established for the year 2020



Tax incentives and installation support

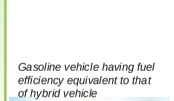
■Tax incentives (tax breaks for eco-cars)

○Reduction and exemption of vehicle taxes for electric vehicles and other next-generation vehicles

○Induction of technical innovation by, based on the level of fuel efficiency, reducing and exempting tax for gasoline vehicles

■Installation support of environmentally-friendly vehicles

○A certain amount of financially support will be given when purchasing vehicles with superior environmental performance


Gasoline vehicle having fuel efficiency equivalent to that of hybrid vehicle


Electric vehicle


Compressed natural gas (CNG) vehicles

Promotion of optimum utilization of vehicles

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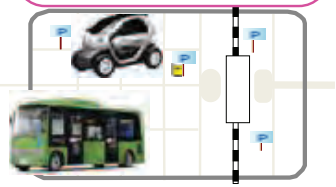
In addition to measures for new vehicles, it is important to create an environment that promotes optimum use of vehicles and dissemination of environmentally-friendly vehicles
- Promotion of energy saving driving of vehicles by promoting eco-drive
- Development of an urban space with environmentally-friendly vehicles such as extra small mobility and electric buses
- Designing of future lifestyle that makes the best of functions within electric vehicles

Promoting eco-drive

The way of using vehicles with less impact on environment (eco-drive, etc.) has penetrated widely into the society, making it possible to reduce CO_2 of not only new vehicles, but also retained vehicles.
Awareness raising and promotion of eco-drive by means of "10 recommendations for eco-drive" and EMS (eco-drive support equipment).

Urban development using environmentally-friendly vehicles

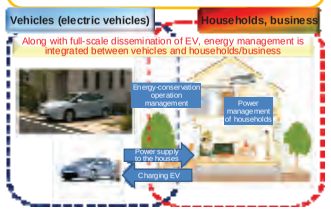
Promotion of development and dissemination of extra-small mobility through inter-sector cooperation between urban development and vehicles. Extra-small mobility, highly convenient and low in environmental impact, is appropriate for traveling within regions that are difficult to be covered by public transportations and bicycles.
Also promote dissemination of zero-emission EV with low noise and vibration by encouraging the introduction or development of electric charge system and linking it with urban development



○Benefits from introducing and disseminating extra-small mobility
- CO_2 reduction
- New transport means in the city and region (supplementary to public transportation)
- Tourism and regional development
- Support movements of the aged and families with small children

Integrated energy management of vehicles and households

Integrated implementation of the vehicle energy management and household/business energy management will induce energy conservation activities, leading to further energy conservation.



○Dissemination of EV by linking it with households
- Easy energy conservation management at the household (eco-drive), improvement of convenience
- Integrated management of vehicles types and numbers
- Mutual utilization among manufacturers

○ Effective utilization of batteries
- Effective utilization of unused power of car-mounted batteries in the households
- Minimization of power loss and securing of durability of batteries

Measures to ensure traffic flow

- Smooth traffic flow will raise traveling speed, which in turn improves fuel efficiency and reduces CO_2 emission from vehicles
- In order to meet the target set under the Kyoto Protocol, loop and other trunk road network should be developed. In addition, bicycle-friendly environment should be developed, ITS should be promoted, and bottleneck crossing should be eliminated to further reduce CO_2 emissions

Principal countermeasures

Development of a bicycle-friendly environment

Mitaka City, Tokyo (bicycle road)

Amagasaki City, Hyogo (bicycle lane)

Promotion of the Intelligent Transport System (ITS)

Elimination of bottleneck crossings and others

Before elevation of railway

After elevation of railway

Continuous grade separation project of the Keihin Kyuko Line and Keihin Kyuko Airport Line (Tokyo)

■Development of bicycle roads by reorganizing the road space

■Promotion and dissemination of VICS, which offers information on congestion to the drivers, allowing them to take optimum routes

■Less congestion brought by higher traveling speed

Promotion of the use of public transportation

- Promotion of the use of public transportation with less environmental impact by increasing their convenience

Development of new railway lines, promotion of the use of existing railway and bus services

Development of new railway line

To regenerate the urban functions and create attractive urban spaces, new subway lines are to be developed that enable quicker transportation and increased convenience

- Tozai Line, Sendai (scheduled to open in 2015)
- Sotetsu – JR through line (scheduled to open in 2015)
- Sotetsu – Tokyu through line (scheduled to open in 2019)

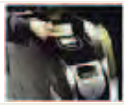
Example of developing the subway
:Tokyo Metro – Fukutoshin Line

Introduction of LRT and BRT in the urban area

Efforts are made to promote LRT systems that are linked with urban space development to establish a user-oriented transport system with less environmental impact

Promotion of computerization such as introduction of the IC card

Efforts are made to promote computerization by introducing IC cards that offer more convenience to passengers



Better traveling space for buses and trams

Development of bus lanes on the road, provision of traveling space for road transport system, and development of stops

Promote introduction of non-step buses

To provide higher comfort to the elders, disabled, and so on, highly convenient non-step buses should be more actively introduced.

13,822 buses already purchased all over the country (as of the end of March, 2009)

Promotion of barrier-free environment in railway station

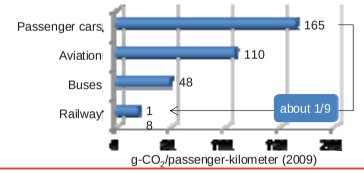
Efforts are made to promote barrier-free equipment such as elevator installation to eliminate trouble with steps, and/or installation of toilet equipment more easily accessible to the disabled in the existing railway stations.

Heightened energy use efficiency of railway

■ Railway is a traffic means with less environmental impact than other transportation. Nevertheless, further technical development and introduction of cars and facilities with higher energy efficiency are pursued such as by using regenerative electric power to enhance further energy use efficiency. The aim here is to contribute to reducing emissions from the transportation sector

Railway with less environmental load

CO_2 emission per transport amount (passengers)



Advanced type of energy conservation type cars

Hybrid car*

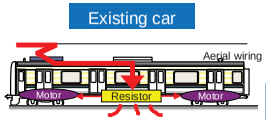
- Under commercial operation on the Koumi Line, JR Higashi Nihon

RV without aerial wiring

Tax support for promotion of introduction of energy conservation type cars

[Applicable car (example)]

Existing car

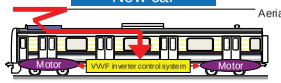


The resistor is used to control the motor, which generates unused energy.

Improvement of CO_2 emission

Renewal

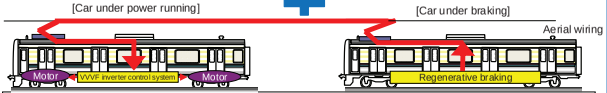
New car



VVVF inverter control system: Mechanism for highly efficient control of motor speed without using the resistor

[Car under power running]

[Car under braking]



Regenerative braking: Electric power generated by cars during braking returns to the aerial wiring and will be used by other cars in operation

* Electric cars are to be renewed to the type equipped with both the VVVF inverter control and regenerative brake. (Renewal of the cars already equipped with the VVVF inverter control is not dealt with here.)
* Railway motor cars are to be renewed to the type with high-efficiency internal combustion engine. (Renewal of the cars already equipped with high-efficiency internal combustion engine is not deal with here.)

Improvement of energy use efficiency of ships

Sea-transport, ship building, ship machinery, universities, research institutes are all focusing on projects for developing energy saving technologies

Improvement of heat efficiency through recovery of exhaust heat
Energy to convert exhaust heat into inboard electric power, enhancing energy efficiency

Exhaust heat recovery system

Engine system (machine, electronic technology)

Navigation system (electronic, information technology)

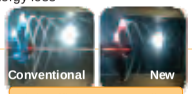
Next-generation operation control system
Advanced navigation control system developed using IT. Propellers and motor are controlled according to weather and hydrographic conditions.

Weather routing system

Propulsion system (material, machine engineering)

Hull system (ship building, material engineering)

Efficiency improved by new type of propellers
High-efficiency propellers with high efficiency developed by eliminating factors contributing to energy loss



High-efficiency propellers

Reduction of frictional resistance
As a means to reduce frictional resistance of the hull, the air lubrication method has been developed, achieving the epoch-making energy conservation.

Air lubrication method

Reduction of CO_2 emissions from ships

Improvement of energy use efficiency of aviation

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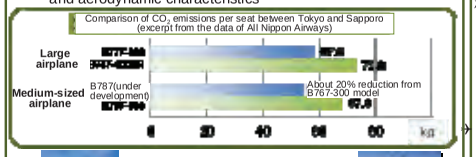
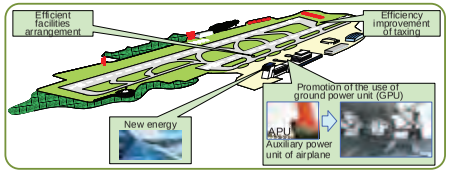
Measures through introduction of new technology (example)

✈Reduction of emissions by renewal to new types of airplane with better fuel efficiency
✈Lighter equipment, employment of high-efficiency engines, and aerodynamic characteristics



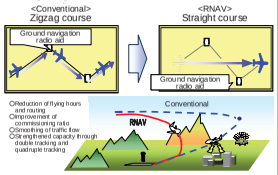
Measures through improvement of airport facilities (example)

✈Promotion of the use of ground power unit (GPU)
Suppression of CO_2 emissions from airplanes by shifting the power source necessary for parking airplanes from auxiliary power unit of the airplane itself to the ground power unit

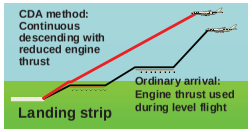


Measures through improvement of navigation (example)

✈ Highly efficient navigation method
➢ Introduction of area navigation (RNAV)
RNAV* will reduce flight hours and routing.
*RNAV (aRea NAVigation)

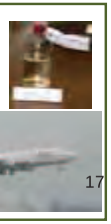


✈ High-efficiency arrival method
○Introduction of continuous descending approach (CDA)



Measures through utilization of alternative fuel (example)

✈ Development of alternative fuel applicable without the need to modify airframe
✈ Technological Development for refining jet fuel from nonfood plants
✈ Various tests including flight tests for their practical implementation
➢ Flight test conducted by Japan Airlines in 2009



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Promotion of dissemination of environmentally-friendly vehicles

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Approximate amount for 2012: ¥774 million

Promote environmental measures against global warming and air pollution in the vehicle sector such as: encouraging road haulage operators to replace existing vehicles with environmentally-friendly types; and/or to purchase such vehicles

Subsidized vehicles	Level of subsidization
CNG trucks and buses	**- For purchasing new vehicles and abandoning aged ones** 1/2 or less of the difference in price with a normal vehicle or 1/4 or less of the vehicle's main body price
Hybrid trucks and buses	**- For purchasing new vehicle only** 1/3 or less of the difference in price with a normal vehicle or 1/4 or less of the vehicle's main body price
Modification of vehicles in use to CNG vehicles	1/3 or less of the modification costs

CNG (Compressed natural gas) truck and bus
➢PM not discharged and NOx reduced by 50% or more
➢CNG station necessary

Hybrid truck and bus
➢Two power supplies; internal combustion engine and motor
➢New infrastructure development not necessary

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Integrated approach to promote CO_2 emissions reduction and energy conservation between vehicles and the household/business sectors

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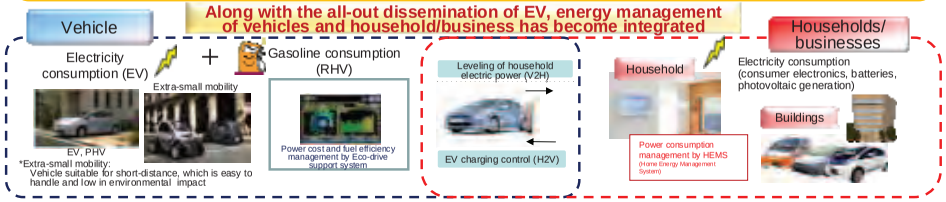
2012 budget amount: ¥4.2 million

By developing an ICT-based energy conservation system for integrated management of energy consumption of vehicles and the household/business sectors, promote, in an integrated manner, dissemination of EV (electric vehicles, plug-in-hybrid vehicles, extra-small mobility) and measures for optimum CO2 emission reduction and energy conservation in the household/business sector.

Along with the all-out dissemination of EV, energy management of vehicles and household/business has become integrated



Effective and efficient utilization of car-mounted batteries necessary

Enables energy conservation from a new point of view

In the field of vehicle energy management that has a linkage with household and business sectors, those development and verification projects with particularly high feasibility, effectiveness, and pioneering features are evaluated and selected to receive funding.

≪Principal issues necessary for selection of the project≫

Linkage with houses

Effective and efficient utilization of car-mounted batteries

○Effective use of EV's battery for purposes other than running (Utilization of unused power for household purposes, utilization of nighttime power)
○Minimization of power loss and securing durability of batteries (Charge/discharge control appropriate to the actual daily utilization state)

Promoting dissemination of EV through linkage with households

○Easy energy conservation management (Eco-drive) in households
○Integrated energy conservation management covering multiple vehicle types and numbers
○Enhanced EV usability (confirmation of cruising distance)
○Realization of mutual utilization among manufacturers

*Implemented in conjunction with the "Advance Project of Housing and Buildings CO_2 Reduction", Housing Bureau

Fields subject to regulation under the Energy Use Law

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➢ The Energy Use Law (Act on the Rational Use of Energy) was established in 1979 at the time of the oil crisis
➢ Provisions related to the transportation sector (transport operators and owner) were added in 2005

(1) Plant and business establishment

Operators with energy consumption level of 1,500 KL (as converted to crude oil) or more per year

Modified from plant and business establishment to individual operators when revised in 2008

(2) Transport

◆Transport operators with the transport capacity above a certain set level such as 200 trucks, 300 railway cars (currently 599 operators)

◆Owners ordering cargo transport of 30 million ton-kilometers per year (currently 861 owners)

(3) Houses and buildings

Large buildings with a total floor area of 2000 m^2 or more

Medium buildings with the total floor area of 300 m^2 or more

Operators building and selling residential buildings (supplying 150 houses or more per year)

Covered by the Law as a result of the revision in 2008

(4) Machinery and equipment

23 items including passenger cars, air conditioners, TV sets, etc. (accounting for about 80% of power consumption in households)

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Regulations in the Energy Use Law (transportation sector)

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- Transport operators with a capacity above a certain level (not only the so-called transport operators but also those conducting private physical flow) are obliged to prepare an energy conservation plan and to report regularly on their energy consumption.
- Owners above a certain level of scale are also obliged to prepare an energy conservation plan and to report regularly on their energy consumption in order to promote modal shift and conversion to independent transport.
- Individual operators are obliged to make efforts to reduce specific energy consumption by an annual average of 1% or more for a long-term and medium-term span.

[Measures related to all operators]

Criteria for transport operators | Criteria for owners

○Numerical target: Specific energy consumption reduced by an annual average of 1% or more

○Energy conservation measures
・Introduction of good-mileage vehicles
・Promotion of eco-drive
・Enhancing loading efficiency
・Reduction of transport by air

○Energy conservation measures
・Designation of a person responsible for energy conservation
・Modal shift
・Approach to the joint ordering
・Implementation of in-house training

[Measures related to specific transport operators and owners]

Transport operators with the capacity of a certain level or more (*1)

*1) 300 railway cars, 200 trucks, 20,000 gross tons or larger ships

Owners ordering load transport exceeding a certain level (*2)

*2) Annual ordering amount of 30 million ton-km or more

Report to the Minister of Land, Infrastructure, Transport and Tourism (once a year by the end of June)

Report to the competent minister (Once a year by the end of June) (Minister of Economy, Trade and Industry, Minister having jurisdiction over the business)

○Operators are obliged to report on the transition of their set unit of energy consumption and on the state of its efforts for energy conservation every year.

Adjuration, disclosure, order or fine in case there is excessive inadequacy in operators' approach towards energy conservation

Criteria for transport operators

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Criteria: Notification of items to be dealt with by transport operators for rationalization of their energy use as stipulated by the government in Articles 52 and 66 of the Law

●Criteria for cargo transport operators concerning rationalization of energy use related to cargo transport (2006 Ministerial Announcement No.7 of the Ministry of Economy, Trade and Industry and Ministry of Land, Infrastructure, transport and Tourism)

●Criteria for passenger transport operators concerning rationalization of energy use related to passenger transport (2006 Ministerial Announcement No.6 of Ministry of Economy, Trade and Industry and Ministry of Land, Infrastructure, transport and Tourism)

・Targeting at reducing by an annual average rate of 1% specific energy consumption in the medium to long term

・Development of an in-house system for energy conservation

・Introduction of efficient transport machinery and equipment

・Promotion of efficient operation (eco-drive)

・Efficient use of transport machinery and equipment for securing of back-haul cargo

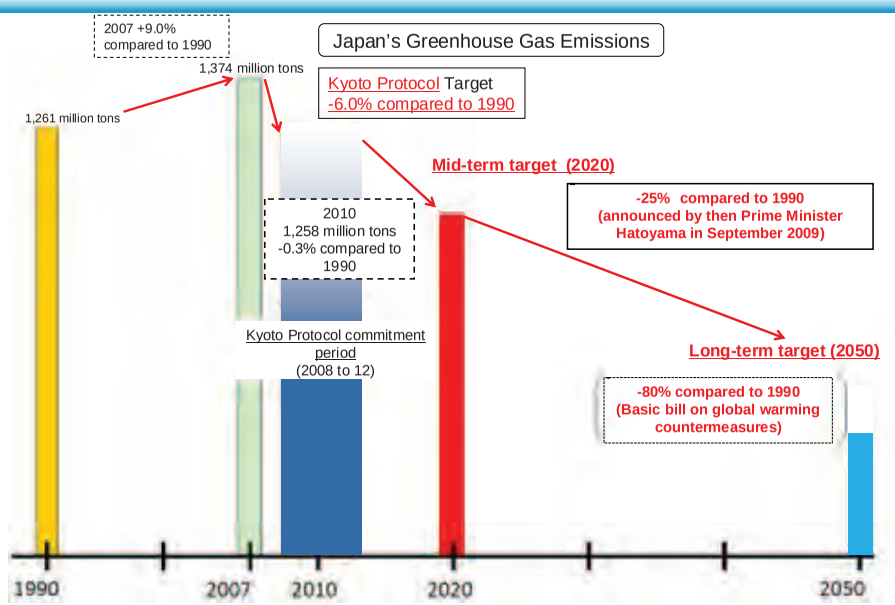
(* Equation to calculate the specific energy consumption for each transportation sector
・Cargo: [Energy consumption (kL)] / [transport ton-km (10,000 ton-km)]
・Passenger: [Energy consumption (kL)] / [Transport km (km)]
・Aviation: [Energy consumption (kL)] /[available ton-km (ton-km)])

Environmental Measures for Housing and Buildings

Housing Bureau,
Ministry of Land, Infrastructure, Transport and Tourism

国土交通省
Ministry of Land, Infrastructure, Transport and Tourism

GHG Emissions Trend and Mid- to Long-Term Target in Japan



Review of Energy and Environmental Policies in Response to Great East Japan Earthquake and Nuclear Power Plant Accident and the Future Options

<Presentation of options>
■ In response to the Great East Japan Earthquake on March 11, 2011, and the following accident of Tokyo Electric Power Company's Fukushima No. 1 nuclear power plant, the government established the Energy and Environment Council and began review of energy and environmental strategies from scratch.
■ It proposed three options related to energy and environmental issues targeting 2030 (based on nuclear power dependence, 1) zero scenario, 2) 15% scenario, and 3) 20% to 25% scenario).
■ The three options are to promote renewable energies and energy savings to the utmost limit to reduce dependence on nuclear power and fossil fuel, improve energy security and reduce greenhouse gas emissions.

Occurrence of Great East Japan Earthquake and nuclear power plant accident

Drastic review of energy and environmental strategies at the Energy and Environment Council, subcommittee of the Council on National Strategy and Policy
・December 21, 2011: decision of basic policy for presenting options
・June 29, 2012: presentation of options related to energy and environmental issues

● **3 options related to energy and environmental issues**

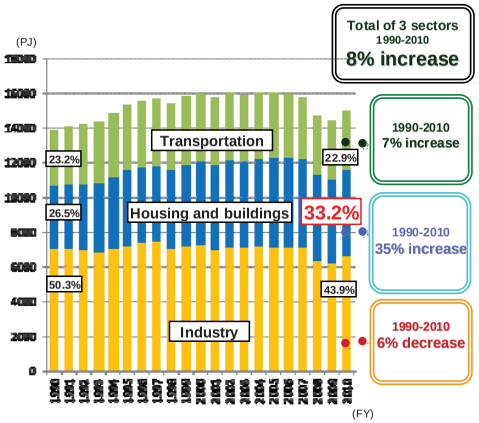
	2010	Zero scenario		15% scenario	20% to 25% scenario
		Before promoting measures	After promoting measures		
Nuclear power ratio	26%	0% (▲25)	0% (▲25)	15% (▲10)	20~25% (▲5~▲1)
Fossil fuel ratio	63%	70% (+7%)	65% (similar to current level)	55% (▲10)	50% (▲15)
Renewable energy ratio	10%	30% (+20%)	35% (+25%)	30% (+20%)	25~30% (+15~20%)
Ratio of non-fossil power source	37%	30% (▲7%)	35% (similar to current level)	45% (+10%)	50% (+15%)
Power generation	1.1 trillion kWh	Approx. 1 trillion kWh (▲10%)	Approx. 1 trillion kWh (▲10%)	Approx. 1 trillion kWh (▲10%)	Approx. 1 trillion kWh (▲10%)
Final energy consumption	390 million kl	310 million kl (▲19%)	300 million kl (▲21%)	310 million kl (▲19%)	310 million kl (▲19%)
Greenhouse gas emissions (compared to 1990)	▲0.3%	▲16%	▲23%	▲23%	▲25%

※ Compiled based on materials of 21st joint meeting of Environment Subcommittee Panel on Infrastructure Development, working group on environment of Transportation System Subcommittee of Council of Transport Policy (July 19, 2012)

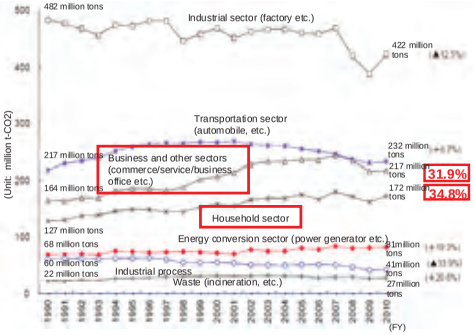
Trend of Energy Consumption and CO2 Emissions in Housing and Buildings

- **Housing and buildings account for more than 30 percent of total energy consumption in Japan. With significant increase in the last two decades compared to industrial and transportation sectors. Against the backdrop, measures to improve energy efficiency have been called for.**
- **CO2 emissions of the housing and buildings sector have also increased significantly than other sectors.**

【Trend of Final Energy Consumption】



【Trend of CO2 Emissions】

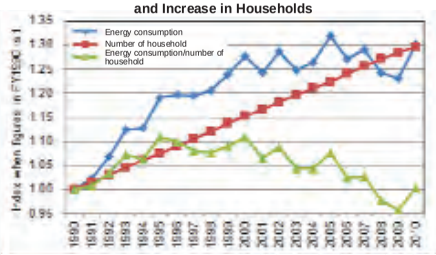


Main Causes of the Increase in Energy Consumption in Housing and Buildings

☐ Housing

- Changes in lifestyle including increase in the number of households and use of electric device are believed to have large impact on the growth of energy consumption in the housing sector.

Trend of Energy Consumption in Housing Sector and Increase in Households



Source: FY2010 Energy Supply Demand Result (Resources and Energy Agency)

Trend of Number of Device Owned per Household

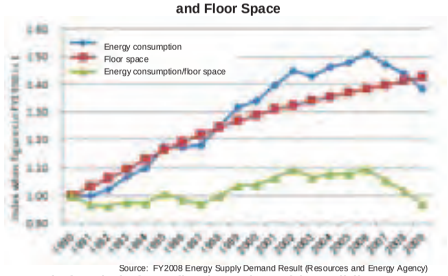
Color TV	2.0 (FY1990)→2.4(FY2009)
Air conditioner	1.3 (FY1990)→2.6 (FY2009)
Refrigerator	1.2 (FY1990)→1.3 (FY2003)
Computer	0.1 (FY1990)→1.2(FY2009)
Toilet seat with warm washer	0.0 (FY1990)→1.0(FY2009)
DVD player	0.0 (FY1990)→1.2(FY2009)

Source: Directory of energy and economic statistics (2011)

☐ Buildings

- The main reason for the growth in energy consumption in buildings is believed to be changes in usage including the increase in floor space and period of use (business hours).

Trend of Energy Consumption related to Buildings and Floor Space



Source: FY2008 Energy Supply Demand Result (Resources and Energy Agency)

Trend of Period of Use (business hours) by Building Usage

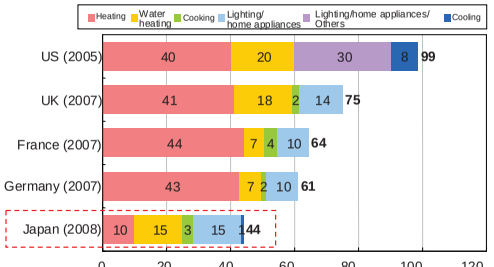
		1990	2005	Growth Rate	Unit
Department store		8.7	9.8	12.6%	Business hours per day
Convenience store		22.1	23.6	7%	Business hours per day
Supermarket	Large	10.2	12.6	23.5%	Business hours per day
	Medium-sized	10.4	11.4	9.6%	Business hours per day
Office	Self owned	10.6	11	3.8%	Hours of buildings used per day
	Rent	11.2	11.8	5.4%	Hours of buildings used per day

Date released by Association of Department Stores and Japan Chain Stores Association and report on building energy consumption in Kansai region-survey on energy consumption by large business establishments in Tokyo

Comparison of Energy Consumption per Household in the World

- Energy consumption for heating is much smaller in Japan than European and north American countries where the ratio is very high, whereas energy consumption for water heating and lighting and home appliances in energy consumption is higher in Japan.
- Climate and lifestyle differ greatly by country or region and, as a result, the structure of energy consumption differs. Thus, energy saving measures that suit their own country or region are needed.

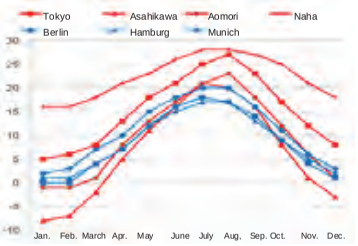
Energy Consumption per Household (GJ/household, year)



* Source: Jyukankyo Research Institute Inc. (compiled based on statistical data of each country Sep. 2010)
* Note: Figures in parentheses are years of latest data of each county.
Cooking of the US is included in lighting, home appliances and others.
Households of two or more people excluding one-person households in case of Japan. Cooking of Japan is for gas and LPG excluding heating and water heating, excluding power for cooking.
Data of European countries does not include cooling.

For example, when compared with Germany,
•energy consumption for heating is one-fourth,
•energy consumption for heating water and lighting and home appliances is 50 percent to 100 percent greater.

Average Monthly Temperature in Japan and Germany



Source: Weatherbase

- **Asahikawa (northern most region)**

Thick insulation

- **Naha (southernmost region)**

Long eaves to keep the sun out

Past Energy Saving Efforts in Housing and Buildings

Category	1970 ~	1980 ~	1990 ~	2000 ~	2010 ~
① Regulations based on Energy Saving Act		• 1979 ~ Energy Saving Act (obligation to make best efforts)		• 2003 ~ (notification required) [non-housing buildings with floor space of 2000m² or more]	
				• 2006 ~ (notification requirement extended) [housing with floor space of 2,000m² or more] [major renovation etc. of housing and buildings with floor space of 2,000m² or more]	
		• 1980 ~ Energy-saving standard (1980 standard)		• 2009 ~ (housing top runner scheme introduced) [detached housing built by builders (150 or more houses/year)]	
			• 1992 ~ (1992 standard) (enhanced) • 1993 ~ (1993 standard) (enhanced)	• 2010 ~ (notification requirement extended) [construction of houses and buildings with floor space of 300m² or more]	
				• 1999 ~ (1999 standard) (enhanced)	• 2012 ~ Energy-saving standard (to be revised: primary energy consumption standard)
② Labeling and information offering on energy saving				• 2000 ~ <law on promotion of housing quality assurance> housing performance labeling program	
				• 2001 ~ Comprehensive Assessment System for Built Environment Efficiency (CASBEE)	
				• 2009 ~ <Energy Saving Act> Housing energy saving label	
③ Incentives				Loan • 2007 ~ Flat 35S (preferential housing loan interest rate)	
				Budget • 2008 ~ Program on advanced CO2-saving housing and buildings	
				• 2008 ~ Renovation promotion program for energy saving	
				• 2010 ~ Housing eco-point	
					• 2012 ~ Program to promote zero-energy in housing
				Taxation • 2008 ~ Taxation system to promote renovation for energy saving	
				• 2009 ~ <Law on the promotion of long-lasting good housing> Long-lasting good housing certification program (tax reduction for housing loan, fixed assets tax reduction, etc.)	
					• 2012 ~ <Low Carbon City Promotion Act > Low-carbon building certification program (tax reduction for housing loan, easing of floor-area ratio, etc.)

Overview of Regulations on Housing and Buildings under Energy Saving Act

- **Efforts are requested to be made to meet the standard for insulation of exterior wall and windows and air-conditioners (energy saving standard) when housing and buildings of a certain size are newly constructed and notification to prefectural governments are required (instruction, announcement, order, penalty are issued or imposed when they are considered significantly insufficient)**
- Law revision in 2008 extended the target of the notification requirement (housing and buildings with floor space of 2,000 m² or more → 300 m² or more).
- Energy saving standard is planned to be reviewed to use easy-to-understand indicators of energy consumption instead of standard using insulation specifications.

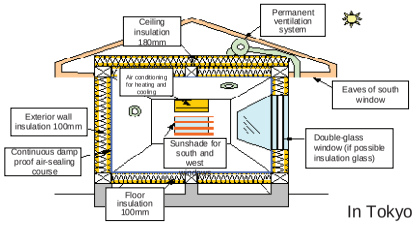
☐ Regulations on new construction under Energy Saving Act (*)

Target Structure	Requirements	Security Measures when Energy Saving Efforts are Significantly Insufficient
Large buildings (2000m² or more)	Notification required	Instruction, announcement, order, penalty (fines of 1 million or less)
Mid-sized buildings (300m² to 2000m²)	Notification required	Recommendation (no penalty)
Small buildings (less than 300m²)	Efforts required	No
Builders that build 150 or more ready-built detached houses per year	Efforts required	Recommendation, announcement, order, penalty (fines of 1 million or less)

* In addition to regulations for new construction, notification at major renovation and periodical report of every three years after the notification are required.

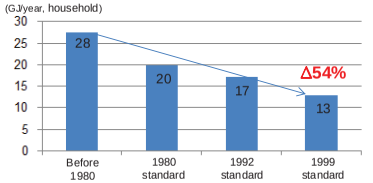
☐ Energy Saving Standard (Housing)

◇Assessed based on insulation specifications of exterior wall and window



In Tokyo

◇Established in 1980 and enhanced in 1992 and 1999



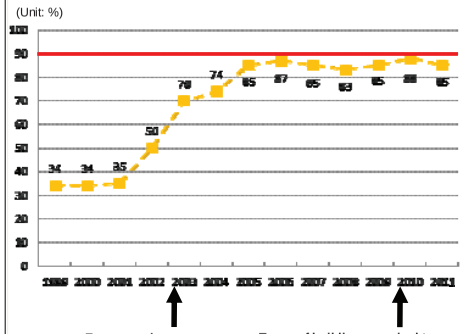
Comparison of Annual Energy Consumption for Heating and Cooling*

(* Estimated based on certain assumptions by MLIT)

Trend of Energy Saving Standard Compliance Rate

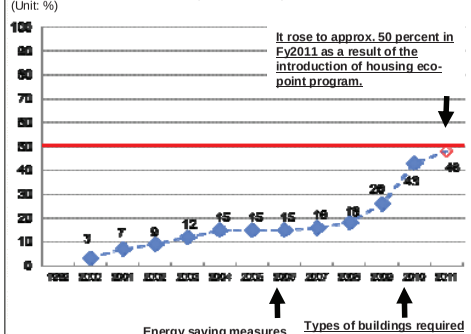
- As a result of making the regulations more strict, the compliance rate of non-residential buildings has reached approx. 90%.
- As for housing, the standard compliance rate, which used to be less than 20%, increased to approx. 50% as a result of the introduction of housing eco-point program.

Trend of Energy Saving Standard Compliance Rate of Newly Constructed Buildings* **(1999 standard)**



* Ratio of floor space of buildings that comply with energy saving standard (1999 standard) out of all buildings with a floor space of 2,000㎡ or more whose construction was certified in the applicable year

Trend of Energy Saving Standard Compliance Rate of Newly Constructed Housing* (1999 standard)



* Estimate until FY2010 is based on a survey on distribution of the number of households complying with housing insulation standard, and estimate for FY2011 (provisional figure) is based on the number of households for which eco points are issued (detached house) as well as notification survey of energy saving act (condominium, etc.)

Development and Promotion of Comprehensive Assessment System for Built Environment Efficiency (CASBEE)

- **Development and promotion of Comprehensive Assessment System for Built Environment Efficiency (CASBEE), an integrated system to assess improvement of environmental quality and performance (interior environment and consideration of landscape of housing, building and city development and reduction of load on global environment as comprehensive environmental performance and present the result in an easy-to-understand indicator (from 2001)**

Image of CASBEE

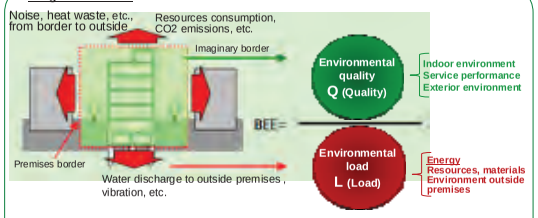
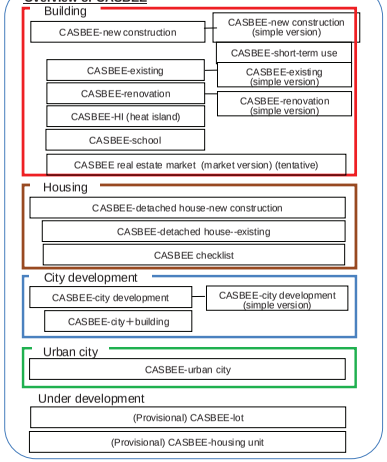


Image of Assessment Result

Notification programs by local governments

- In 24 prefectures and government-decreed cities, notification and announcement of CASBEE building assessment results was introduced for a certain scale of buildings.
  2011 result: 1,991 cases (result of notification programs by local governments)

Overview of CASBEE



Assistance Measures related to Energy-Efficient Housing and Buildings

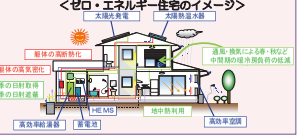
- **Fiscal, financial and taxation measures to assist construction and renovation of energy-efficient housing and buildings, which include assistance for construction of zero-energy housing by small and medium-sized builders, reduction in interest rate of housing loans for energy-efficient houses, and special taxation measure for energy-efficient renovation.**
- **Based on the bill on the promotion of low-carbon city development (currently under submission to the Diet), assistance in the form of special taxation measures for certified new houses is planned.**

Budget

Program to promote zero-energy housing

Assist construction of zero-energy housing by small and medium-sized builders.

<ゼロ・エネルギー住宅のイメージ>

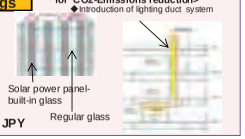


2012 budget: 2.3 billion JPY

Program on advanced CO2-saving housing and buildings

Assist advanced housing and building project that introduces CO2-emmissint-efficient technology.

<Image of introduction of technology for CO2-Emissions reduction>
◆Introduction of lighting duct system



2012 budget: figure in parenthesis of 17.3 billion JPY

Housing eco-point program

Issue points exchangeable with certain goods for construction or renovation into energy-efficient houses

<Housing eco-point: renovation examples>

2011 third supplementary budget: 144.6 billion JPY

* Reservation acceptance ended on July 4, except damaged area

Project to promote energy-efficient building renovation

Assist renovation into energy-efficient buildings with more than 10 percent reduction of energy consumption

<Image of energy-efficient renovation>

Renovation into energy-efficient building: examples
•Energy-efficient framework (roof, exterior wall insulation, etc.)
•Renovation into high efficiently facility (air conditioning, ventilation, etc.)

2012 budget: figure in parenthesis of 17.3 billion JPY

Loan

Flat 35S

Lower housing loan interest rate for energy-efficient housing

2011 third supplementary budget: 15.9 billion JPY
2012 initial budget: 10.3 billion JPY

Taxation

Taxation system to promote energy-efficient renovation

Deduction and reduction of income tax and fixed assets tax for certain energy-efficient renovation

Low-carbon emissions building certification program (scheduled)

Based on the Low Carbon City Promotion Act (bill submitted to the current Diet), expansion of the upper limit for housing loan tax reduction and registration license tax rate reduction are planned for certified energy-efficient new housing.

Program to Promote Energy-Efficient Building Renovation

2012 budget: part of 17.3 billion JPY

Invite applications for energy-efficient renovation projects that include improvement of energy efficiency of exterior wall and windows, etc., of buildings and renovation into energy efficient air conditioning and water heating facilities and assist part of the renovation cost, thereby promoting improvement of energy efficiency of existing buildings.
***For promotion of further energy efficiency improvement, measure energy consumption from renovation work for continuous energy management and energy-saving efforts.**

[Requirements]
- Requirements
•Renovation into energy-efficient framework (exterior wall, window, roof, etc.)
•Renovation is expected to improve energy efficiency by more than 10 percent.
•Measure energy consumption, etc., to find out the actual situation so that energy consumption is managed and energy-saving efforts are made continuously, etc.
- Target of assistance
  Renovation cost, facility cost, cost related to energy measurement.
- Assistance ratio/limit
  1/3 50 million JPY (25 million JPY for facility cost)

[Results of Application and Approval]

	Number of Application	Number of Approval
FY2008 (Dec. 26, 2008-Jan. 29, 2009)	Approx. 1,810	Approx. 480
FY2009 Phase 1 (May 25, 2009-June 25, 2009)	Approx. 120	Approx. 110
FY2009 Phase 2 (Aug. 11, 2009-Sep. 25, 2009)	Approx. 220	Approx. 200
FY2010 Phase 1 (March 5, 2010-Apr. 16, 2010)	Approx. 520	Approx. 480
FY2010 Phase 2 (Aug. 16, 2010-Sep. 15, 2010)	Approx. 840	Approx. 230
FY2010 Phase 3 (Dec. 1, 2010-Dec. 22, 2010)	Approx. 590	Approx. 370
FY2011 (June 6, 2011-Aug. 1, 2011)	Approx. 460	Approx. 300
FY2012 (Apr. 20, 2012-May 25, 2012)	Approx. 370	Approx. 290

Application approved if contents meet requirements and within the budget

Financial assistance for energy-efficient renovation

<Examples of energy-efficient renovation>

☐ **Renovation into energy-efficient framework (exterior wall)**
- Roof, exterior wall, etc. (insulation)
- Opening (double glass, etc.)
- Sunlight block (eaves, louver, etc.), etc.

＋

☐ **Renovation into energy efficient facilities**
- Air conditioning, ventilation, water heating, lighting, elevator, etc.

<Examples of energy-efficient renovation>

Before

After

Measurement and report of energy consumption
Continuous energy management and energy-saving efforts

Program on Advanced CO2-Saving Housing and Buildings

2012 budget: part of 17.3 billion JPY

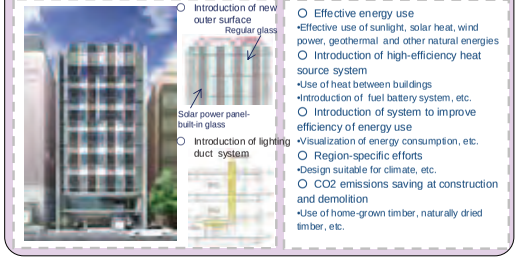
Invite suggestions on leading housing and building projects with excellent CO2-saving capacity from the public sector and assist them to proactively promote CO2-saving of housing and buildings.

National government invites suggestions from the public sector. (assessed by experts)

Implementation of leading projects

New construction | **Renovation of existing structure** | **Management system development, etc.**

<Project Image>



<Possible Suggestions>

○ Effective energy use
- Effective use of sunlight, solar heat, wind power, geothermal and other natural energies

○ Introduction of high-efficiency heat source system
- Use of heat between buildings
- Introduction of fuel battery system, etc.

○ Introduction of system to improve efficiency of energy use
- Visualization of energy consumption, etc.

○ Region-specific efforts
- Design suitable for climate, etc.

○ CO2 emissions saving at construction and demolition
- Use of home-grown timber, naturally dried timber, etc.

Publicize project results
→ Contribute to spread of efforts and awareness raising

[Application and Approval Results]

FY of Approval		Number of Application	Number of Approval
FY2008	Phase 1 (Apr. 11-May 12, 2008)	120	10
	Phase 2 (Aug. 1-Sep. 12, 2008)	35	10
FY2009	Phase 1 (Feb. 6-Mar. 31, 2009)	46	16
	Phase 2 (July 15-Aug. 25, 2009)	52	20
FY2010	Phase 1 (Mar. 5-Apr. 9, 2010)	49	13
	Phase 2 (Ag. 16-Sep. 24, 2010)	42	14
FY2011	Phase 1 (May 12-June 30, 2011)	39	12
	Phase 2 (Sep. 9-Oct. 31, 2011)	35	12
	Phase 3 (Nov. 30, 2011-Jan. 20, 2012)	29	21
FY2012	Phase 1 (Apr. 13-May 31, 2012)	60	15
Total		507	143

[Breakdown of Approved Projects]

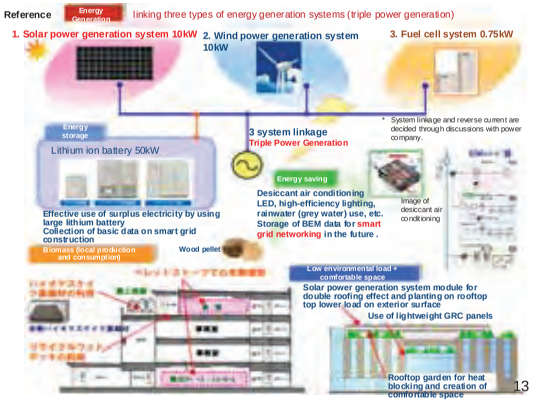
Program on Advanced CO2-saving Housing and Buildings: Example of Approved Project

Project to promote CO2 emissions reduction from Mitani Sangyo Group's new company building
~ We want to play a leading role (abbr.: WSA Project) ~

Mitani Sangyo Co., Ltd. (approved in 2010 Phase 2)

Outline of Proposal	Active introduction of energy generation (solar power and wind power generation), energy saving (desiccant air conditioning, high-efficiency lighting, etc.), energy storage (large lithium battery), technology to reduce environmental load, and use of biomass of local production and consumption, which are more likely to spread in local areas and provide the building for local environmental education, thereby promoting understanding of CO2-emissions saving technologies and contributing to vitalization of local industry.			
Project Outline	Address	Ishikawa-gun, Ishikawa Prefecture	Use	Office
	Project period	FY2010-2011	Floor space	3,563 m^2

Program on advanced CO2-saving housing and buildings
Source: Building Research Institute Advanced website on program on CO2-saving housing and buildings

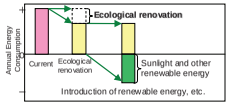


To Realize Zero Energy School ~report from panel on promotion of zero energy school (summary)~ (May 2012)

School facilities are ・・・
- public facilities close to community (serving as base for environmental education for students and shelter in case of disasters)
- annual primary energy consumption is smaller than facilities for other purposes

It is a type of structure that is important to, as well as securing good educational environment, make efforts to transform into zero energy buildings

Transformation into zero energy buildings in the report is to make annual energy consumption virtually zero through energy saving efforts to reduce energy consumption combined with the technology for energy generation using solar power, etc.



Contribution to disaster prevention

Technologies for zero energy schools also contribute to maintaining building functions and indoor environment in case of outbreak of disasters.

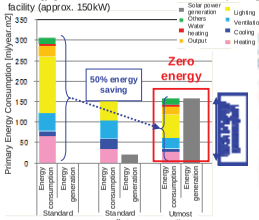
<Power supply> solar and wind power generation
<Heat supply> Air-based solar heating system
<Improvement of indoor environment> high insulation property, sun blocking, daylight use
<Others> Rainwater and grey water utilization facility

Feasibility of zero energy schools (simulation result)

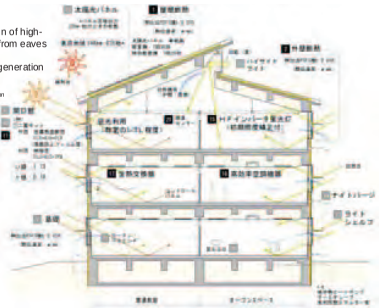
If utmost efforts are made to large-scale solar power generation (+50%), in addition to thorough energy saving (▲50%), energy zero schools are feasible.

Example of utmost efforts

<<Energy saving>> High insulation property, introduction of high-efficiency air conditioning and light shelf (use of daylight from eaves and opening), etc.
<<Energy generation>> solar power generation facility (approx. 150kW)



*Estimated based on scenario of 9,000m^2 RC building in Tokyo



Use for environmental education

Use school facilities for environmental education to deepen understanding and improve environmental awareness among local communities.

<Example of visualization>

Energy saving navigation


Displayed on surrounding fence

<Example of ways to feel the effect>

Small window to feel insulation


Enlarged small window (under installation)

* Photos are from the collection of examples of school development for environmental education (Published by Ministry of Education, Culture, Sports, Science and Technology in September 2011)

Methods for Promotion

Provision of information, etc.	Produce pamphlet, explain in various meetings, etc.
Financial assistance	Eco-school pilot project Use program on Advanced CO2-saving housing and buildings, etc.
Demonstration	Use super eco-school demonstration

Zero Energy Government Buildings (model project)
【Request for Focused Measure for Revitalization of Japan】

Combining active utilization of renewable energy and new technologies with complete application of energy saving and power saving technologies when constructing new government buildings to realize zero energy buildings as a model project

2012 requested amount 431 million JPY (completely new)

"Toward Strategy for Revitalization of Japan" (Aug. 5, 2011, cabinet meeting decision)

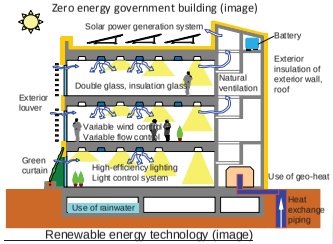
- Renewable energy
- Energy saving
- Fuel, resources
- 6 major issues
- Nuclear power
- Electric power system
- Energy and environment-related industry

→ Reform for low-carbon, recycle-based, sustainable structure

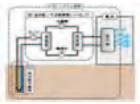
Based on "Toward Strategy for Revitalization of Japan" (cabinet meeting decision)
zero energy government buildings (model project)

Provision of good practice and technical assistance
Promotion of energy efficiency improvement in public buildings

Zero energy government building (image)



Renewable energy technology (image)


Geothermal heat pump


Solar power generation system

Active introduction of renewable energy and new technologies

Use of renewable energy	• Installation of solar power generation system • Introduction of heat source using renewable energy

Complete utilization of energy and power saving technologies

Improvement of insulation	• Improvement of insulation of doors and windows (double and insulation glass) • Improvement of insulation of exterior wall and roof (exterior insulation)
Reduction of heat load	• Installation of exterior louver • Installation of green curtain planters
Improvement of facility efficiency	【Lighting】 ・Introduction of LED lights ・Introduction of light control system 【Air conditioning】 ・Reduction of conveying power (Variable wind control, variable flow control) 【Power source】 ・Installation of battery

Study implementation of model project for zero energy government buildings

(Zero energy)
Annual energy consumption of building < Annual energy production using renewable energy

Council for Promoting Housing and Living for Low-Carbon Society (Outline)

(jointly established by METI, MLIT and MOE)

Purpose

In order to reduce greenhouse gas emissions in Japan, it is necessary to further extend and enhance efforts in the civil sector (household and business) whose emissions have increased more than other sectors compared to the 1990 level.

To this end, concerned members shall discuss on housing, buildings and living to decide the course to be taken towards formulation of specific measures to attain a low-carbon society in 2020.

Members

Chair: Yoichi Kaya, Director, Research Institute of Innovative Technology for the Earth

Members: Hiroyuki Aoki, former chair, Zenkenren
Takao Kashiwagi, professor, Tokyo Institute of Technology
Keiji Kimura, Director, Real Estate Companies Association of Japan
Representative director/chair, Mitsubishi Estate Co., Ltd.
Yuzo Sakamoto, Director, Building Research Institute
Yuko Sakita, journalist, environmental counselor
Director, NPO Genki Net for Creating a Sustainable Society
Representative, NPO Shinjuku Environmental Information Network
Keiko Sakurai, professor, Faculty of Law, Gakushuin University
Go Tamura, advisor, National Federation of Construction Workers' Unions
Hidetoshi Nakagami, professor, Integrated Research Institute, Tokyo Institute of Technology, Managing director, Jyukankyo Research Institute Inc.
Ben Nakamura, professor, Faculty of Engineering, Kogakuin Univ.
Takeo Higuchi, Chair, Japan Federation of Housing Organizations
Representative chair and CEO, Daiwa House Industry
Katsuji Fujimoto, Chair, Japan Construction Material and Housing Equipment Industries Federation, Chair, Nippon Sheet Glass Co., Ltd.
Shuzo Murakami, Director, Institute for Building Environment and Energy Conservation

(in Japanese alphabetical order, honorifics omitted)

Meeting History

1st session (June 2010)	launch of promotion council/ sorting out current situation (Member interview, etc.)
2nd session (November 2010)	Sorting out points of discussions
3rd session (October 2011)	Discussions based on Great East Japan Earthquake
4th session (April 2012)	Interim report (draft)

Interim report (released on July 10, 2012)

I. Policy to promote "good" living

1. Basic idea

- Improvement of energy-saving property of housing and buildings
- Enhancement of measures related to existing stock
- Promotion of effective energy use of housing and buildings
- Promotion of CO2 emissions reduction through overall lifecycle
- Realization of benefit of comfort, etc., through CO2 emissions cut
- Vitalization of housing and construction market

2. Course of measures to be taken

- Promotion of assessment and labeling of energy saving property of housing and buildings
- Preparation of environment for requiring compliance with energy saving standard of new housing and buildings
- Promotion of renovation for energy saving of existing stocks
- Development of model projects in disaster-affected areas, etc.

II. Policy to promote "good" living style"

1. Basic idea

- Introduction of system to promote changes of lifestyle including working style
- Introduction of system to promote effective use of sustainable energy

2. Course of measures to be taken

- Promotion of efforts for low-carbon action through visualization of living and life style
- Promotion of proper selection based on labeling of housing and buildings and facility performance
- Efforts for energy saving and electric power based on living style through experiences of power saving after the earthquake

III.Roles of the people, business operators and government

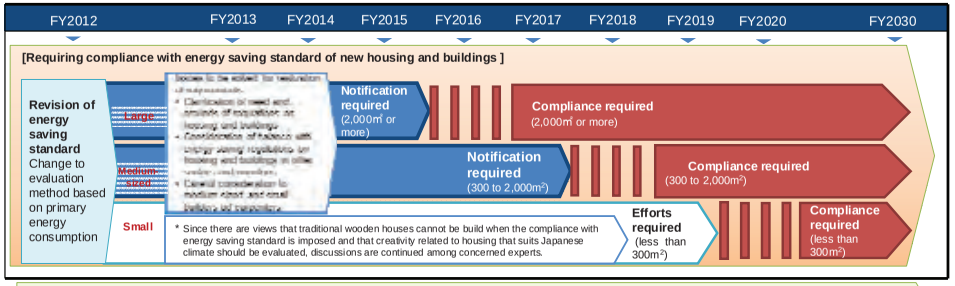
IV. Schedule

Schedule towards Compliance with Energy Saving Standard of New Housing and Buildings

- The Ministry of Economy, Trade and Industry, Ministry of Environment, and Ministry of Land, Infrastructure, Transport and Tourism, jointly established the Council for promoting Housing and Living for Low-Carbon Society to study compliance with energy saving standard of new housing and buildings by 2020 and released an interim report and schedule on July 10.
- Based on the issues below, requirements are imposed gradually in the order of large buildings, medium-sized buildings and small buildings.

[Issues to be solved for meeting the requirements]
- Clarification of need and grounds of regulations on housing and buildings
- Consideration of balance with energy saving regulations on housing and buildings in other sectors and countries
- Careful consideration to medium-sized and small builders ad carpenters
- Study based on opinions that traditional wooden houses would not be built if the compliance with energy saving standard is imposed

- Promotion of improvement of measures related to new construction, enhancement of existing stock and future human resources development to realize low-carbon society



[Improvement of measures related to new construction]	Support for zero energy housing/support for model CO2 saving housing and buildings/certification and support of low-carbon housing and buildings, etc.
[Enhancement of existing stock]	Support for renovation into energy-efficient housing and buildings/promotion of performance of building materials and equipment based on advanced building materials and equipment program, etc.
[Future human resources development]	Support for medium-sized and small builders and carpenters to acquire techniques for energy-saving construction (5 years from 2012 to 2016)/study of evaluation method of traditional wooden houses, etc.

* Excerpt ad summary of Schedule for Promoting Housing and Living for Low-Carbon Society in interim report on Policy to Promote Housing and Living for Low-Carbon Society (July 10, 2012)

Low Carbon City Promotion Act (Outline)

Background

The Great East Japan Earthquake triggered changes in energy supply/demand and raised awareness about energy and global warming issues among the people. It is important to accumulate successful examples of low-carbon cities development and transportation system as well as to rationalize energy use in urban areas by promoting private sector investment, thereby vitalizing housing market and local economy.

Outline of Law

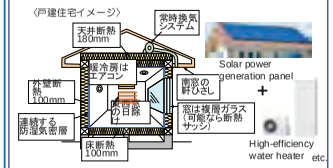
- Formulation of basic policy (ministers of land, infrastructure, transport and tourism, environment and economy, trade and industry)
- Certification of private low-carbon buildings, etc.

【Income and Other Tax Reduction for Low-Carbon Housing】

Year of Residence	Increase in maximum amount of income tax reduction (10 years)		Lowering of registration license tax rate
2012	4 million JPY (3 million JPY general)	Storage registration	0.1% (0.15% general)
2013	300 million JPY (2 million JPY general)	Transfer registration	0.1% (0.3% general)

[Not included in calculation of floor-area ratio]
Floor space exceeding regular building floor space related to facility for low-carbon building (battery, heat storage tank, etc.)

[Image of Certification]



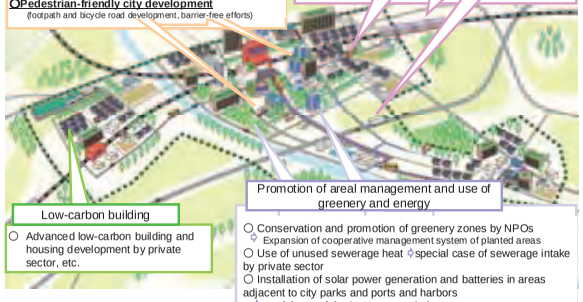
- Formulation of low-carbon community development plan (municipalities)

Concentration of urban functions

- **Concentration of hospital and welfare facility, condominiums, etc.**
  - Creation of private-sector certification program
- Development of integrated parking lots by private sector
  - Special case of obligation to build parking lot in new construction
- **Pedestrian-friendly city development**
  (footpath and bicycle road development, barrier-free efforts)

Promotion of use of public transportation

- Bus line and LRT development, etc, communal transportation system
  - Special case of process for various business acts including bus and railway services
- Automobile CO2 emissions control



Low-carbon building

- Advanced low-carbon building and housing development by private sector, etc.

Promotion of areal management and use of greenery and energy

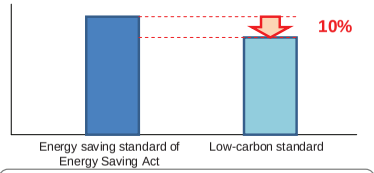
- Conservation and promotion of greenery zones by NPOs
  - Expansion of cooperative management system of planted areas
- Use of unused sewerage heat
  - special case of sewerage intake by private sector
- Installation of solar power generation and batteries in areas adjacent to city parks and ports and harbors
  - special case of dominant use permission

Criteria for Certification of Low-Carbon Building: principle

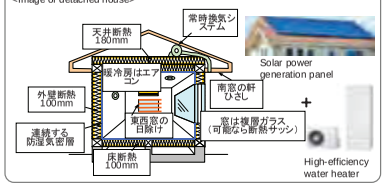
- Primary energy consumption will become more than 10 percent below the energy saving standard of Energy Saving Act.
- Other measures for low carbon emissions will be in place.

Criteria of energy-saving property

○ Primary energy consumption (excluding consumption by home appliances, etc.) is more than 10 percent below the energy saving standard of Energy Saving Act.(*)



<Image of detached house>



* It is required to secure insulation property equivalent to, or higher than, energy saving standard of Energy Saving Act.

Criteria of other measures for low carbon emissions

Certain measures as shown below are in place that are not taken into consideration in standard of energy-saving property and yet contribute to reducing carbon emissions.

○Introduction of HEMS

Visualization of energy consumption and thereby promote residents to take action for low carbon emissions .

○Water saving measure

Measures are taken to contribute to water saving, which include use of water-saving equipment and reusing rainwater.

○Use of timber

Such materials as timber that contributes to low carbon emissions are used.

○ Measures against heat island

Measures to curb heat island are taken, which include planting on premises, rooftop and wall.

Need for Review of Energy Saving Standard

- Under the current energy saving standards, it is difficult to objectively compare energy saving performances of buildings as a whole. It is therefore necessary to revise it and introduce new standards that allow an overall assessment based on primary energy consumption.

Problems of current energy saving standard

- Under the current standard, total assessment of outside insulation and/or facilities cannot be made and thus it is difficult for owners and purchasers to compare their energy saving properties in an objective manner.
- Indicators to assess energy saving property and area classification differ between housing and buildings.
- It is necessary to promote assessing self consumption of energy from solar power generation in addition to energy saving property.

<Problems specific to building standard>

- Outside insulation property and individual facility performance are assessed separately and thus it is impossible to properly assess energy saving efforts of the entire building.
- Because different standards are applied to different buildings such as office and hotel, it is impossible to properly assess energy saving property of multiple purpose buildings.

<Problems specific to housing standard>

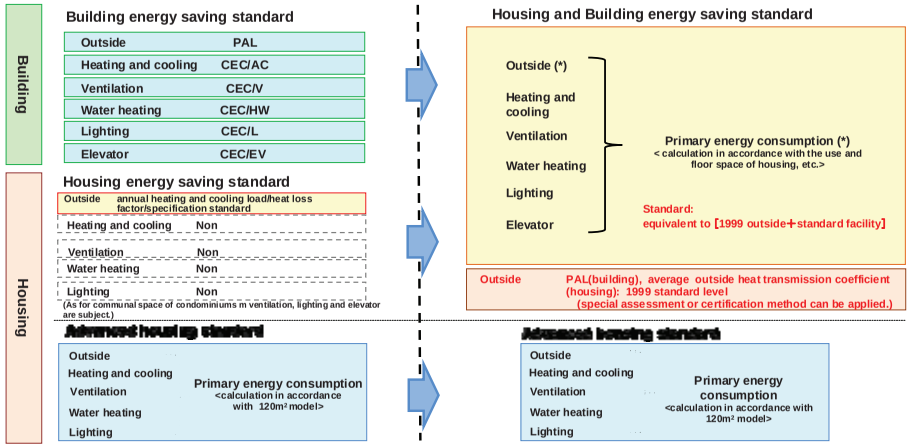
- Since the standard is to assess outside insulation property only, it is impossible to assess the property of heating and cooling, water heating and lighting that all have significant energy saving effects.
- Only energy saving property of 120m² model housing can be assessed with the advanced housing standard for assessing primary energy consumption.

Course of review of energy saving standard

- Use primary energy consumption as an indicator, as is used internationally, for housing and buildings to comprehensively assess facility performance in addition to their insulation property.
- In doing so, use a calculation method that allows assessment of energy saving property in accordance with the use and floor space. Promote assessment of self consumption by installation of solar power generators.

Overview of Reviewing Energy Saving Standard

- The current assessment system of energy saving standard for housing and buildings in which outside insulation property and performance of individual facility are assessed separately is revised to use integrated assessment standard of the entire building, using primary energy consumption as the indicator.
- Set up a calculation method that allows proper assessment of energy saving property in accordance with the use and floor space.
- Outside standard (1999 level) of housing and buildings is required to be met in principle.
- Because the target year of the advanced housing standard is FY2013, current standard is maintained in principle.



* In integrating the indicators, different area classification and calculation of energy saving performance including material value of concrete and other building materials are unified into those of housing.

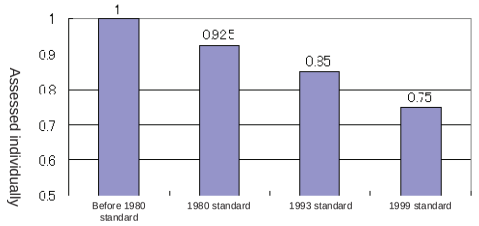
Review of Energy Saving Standard of Buildings (housing excluded) (draft)

Current energy saving standard

○ Insulation property of exterior wall and windows and efficiency of air conditioning, lighting, ventilation, water heating, elevator facilities are assessed individually.

- ◇ Exterior wall and windows, etc.
  - •Enhancement of exterior wall insulation property using insulator, etc.
- ◇ Air -conditioner
  - •Improvement of efficiency of air-conditioner and heat source equipment, etc.
- ◇ Lighting
  - •Introduction of high-efficiency lighting, etc.
- ◇ Ventilation
  - •Wind control using inverter, etc.
- ◇ Water heater
  - •Use of high-efficiency water, etc.
- ◇ Elevator
  - •Introduction of speed control system, etc.

○ Established in 1980 and enhanced gradually in 1993 and 1999.



* Energy consumption needed to have similar indoor environment as that in 1980 (energy consumption index), when the energy consumption of buildings before 1980 standard (conventional type) is regarded as 1.

Energy saving standard after review

○Standard on primary energy consumption

•Comprehensive assessment of insulation property of exterior wall and windows, efficiency of air conditioning, lighting, ventilation, water heating, elevator facilities, and efforts for energy generation including solar power generation

[Image of index of primary energy consumption]
<E.g.> ○○ Gigajoule/m²

＋

○Standard on outside thermal performance

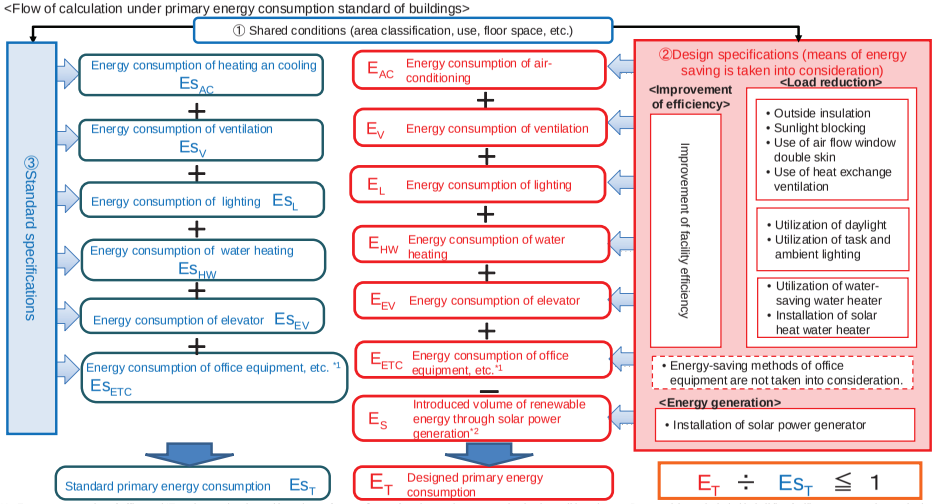
- Request for insulation property of current energy saving standard level (1999) in view of the importance of outside performance and of securing heat environment

○ To be implemented in FY2012

Idea of Primary Energy Consumption Standard of Buildings

- Basic conditions of buildings subject to assessment are: ①under the same conditions, ②calculated values based on the design specifications (designed means of energy saving is taken into consideration) (designed primary energy consumption) are ③ below 1 when divided by calculated values based on standard specifications (standard primary energy consumption).

<Flow of calculation under primary energy consumption standard of buildings>



*1 Energy consumption of office and IT equipment (estimated based on reference figure of equipment heat generation in air-conditioned room. Because it is not included in building facility, energy saving methods are not taken into consideration and identical standard value in accordance with floor space is used for both designed primary energy consumption and standard primary energy consumption.

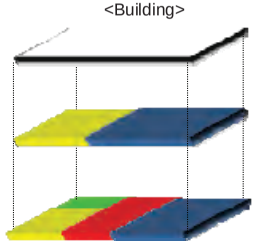
*2 Energy generated by cogeneration facility is included.

Setting Standard Primary Energy Consumption in accordance with Floor Space per Use

- Standard of primary energy consumption for the entire building is calculated based on consumption level set in accordance with the purpose of the building's usage and facility.

① Classify by use and calculate floor space.

<Building>



Office

Meeting room

Lobby

Locker room

② Use standard primary energy consumption per use to calculate it per facility. [E.g.: air conditioning]

Use	Standard Value of Air Conditioning (GJ/m²·year)	Floor Space	Total of Each Use (GJ/year) (standard value x floor space)
Office	1.0	2,000	2,000
Meeting room	0.8	1,000	800
Lobby	0.9	500	450
Locker room	1.0	200	200
Total		3,700	3,450

Standard primary energy consumption per facility (GJ/year) = All use Σ [Standard primary energy consumption by each facility by each use (GJ/m2·year) × Floor space per room (m2)]

③ Add up standard primary energy consumption of each facility to calculate that of the entire building.

Standard primary energy consumption of entire building (GJ/year) = All facility Σ Standard primary energy consumption per facility (GJ/year)

How to Set Standard Primary Energy Consumption based on Floor Space per Use

- Set different standard primary energy consumption level for approx. 200 types of usage in order to take into consideration the difference of energy consumption per use (Standard value of each building use is set in the current PAL/CEC)

8 building use
Office, etc.
Hotel, etc.
Hospital, etc.
Store, etc.
School, etc.
Eatery, etc.
Hall, etc.
Factory, etc.

Further categorized by use

Office, etc. [Unit: MJ/m2·year]

Use	Facility			
	Air conditioning	Ventilation	Lighting	Water heating
Office	872	0	488	16
Meeting room	912	0	231	39
Locker room	780	138	202	768

Central monitoring room	2,677	0	1,171	36

Approx. 200 types of use

○ Energy load is calculated based on each facility's fact survey on their operation time.

Facility	Item
Air conditioning	Length of air conditioning being used, lighting heat generation, number of people in room, device heat generation, etc. per year
Ventilation	Length of ventilation being used, frequency of ventilation, ventilation type, total pressure loss, etc., per year
Lighting	Length of lighting being on, set lighting intensity, device type, maintenance rate, etc, per year
Water heating	Number of days of water heater being used, volume of water being used, etc., per year

○ Based on the energy saving plan submitted in 2010 and 2011, specifications of the structure and facility are set based on which value of the standard primary energy consumption is calculated.

Assessment of Electric Power Generated by Energy Efficiency Improvement Facilities in the Designed Primary Energy Consumption Calculation

- In order to take into account efforts for efficient energy use in housing and buildings, energy generated for self consumption is subtracted from the amount of primary energy consumption when the electricity was generated by energy use efficiency improvement facilities (e.g. solar power generator, etc.).

<Assessment of electric power generated by solar power generator>

①Total of primary energy consumption when solar power generation is not taken into consideration

② Power generated by solar power

③ Self consumption* → **Electric power for selling**

* counted as power generation of building

④Primary energy consumption

①Calculate total primary energy consumption of building equipment and home appliances, etc.

Primary energy consumption of building equipment (heating and cooling, ventilation, lighting, water heating, elevator) + Primary energy consumption of other equipment (home appliances, OA equipment, etc.)

Calculation based on assessment of outside insulation property and facility performance

Automatic calculation based on floor space and use

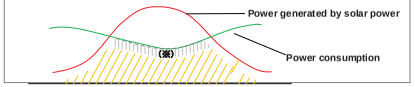
②Calculation of electric power generated by solar power

Calculation of power generation based on amount of solar radiation in the area, panel angle, and power generation efficiency, etc.

③Calculation of self consumption

<Non-housing structure>
Self consumption is considered zero when selling electricity while self consumption is considered 100% when not selling electricity.

<Housing>
Calculate power generation and consumption by hours per house to calculate the amount of self consumption.



(*) Examine the matter to have the following in the future as the assessment method: when battery is installed, calculate as addition for the increase of self consumption.

④subtract ③ from ① to calculate primary energy consumption.

Overview of Housing Performance Labeling Program

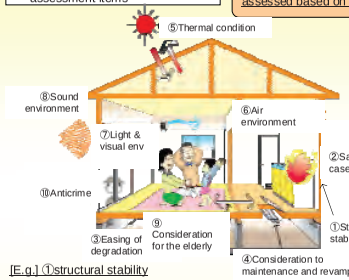
Housing performance labeling program is related to basic housing performance which is:

- Based on **common rules** (performance assessment items, performance assessment criteria set by the national government),
- **impartial and neutral third-party organizations** (registered housing performance assessment organization)
- assess the performance based on grade, etc., through **design document screening** and **inspection of construction site**, and
- **houses to which assessment sheet(*) is issued** are eligible for quick professional **dispute settlement**.

(*1 limited to construction housing performance assessment sheet)

- Image of performance assessment items

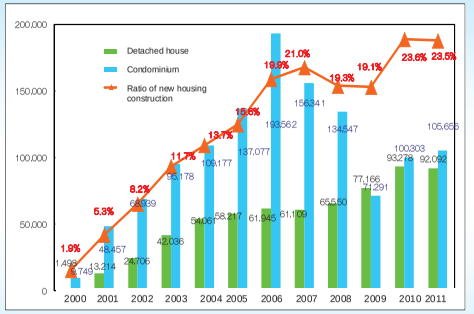
32 items in 10 categories are assessed based on grade, etc.



[E.g.] ①structural stability

Item	Grade	Specific Performance
1-1 quake-resistance grade (prevention of structural framework collapse, etc.) [resistance against collapse by earthquake, etc.]	Grade3	Building does not collapse by 1.5 times as much force as an earthquake that extremely rarely occurs (once every several hundred years)
	Grade2	Building does not collapse by 1.25 times as much force as an earthquake that extremely rarely occurs (once every several hundred years)
	Grade1	Building does not collapse by the force of an earthquake that extremely rarely occurs (1 every several hundred years) ■minimum standard of ball buildings required by Building Standards Act

- Housing performance labeling program result (new houses/2000-2011)



(In addition, housing performance labeling program was implemented for existing houses in FY2002)

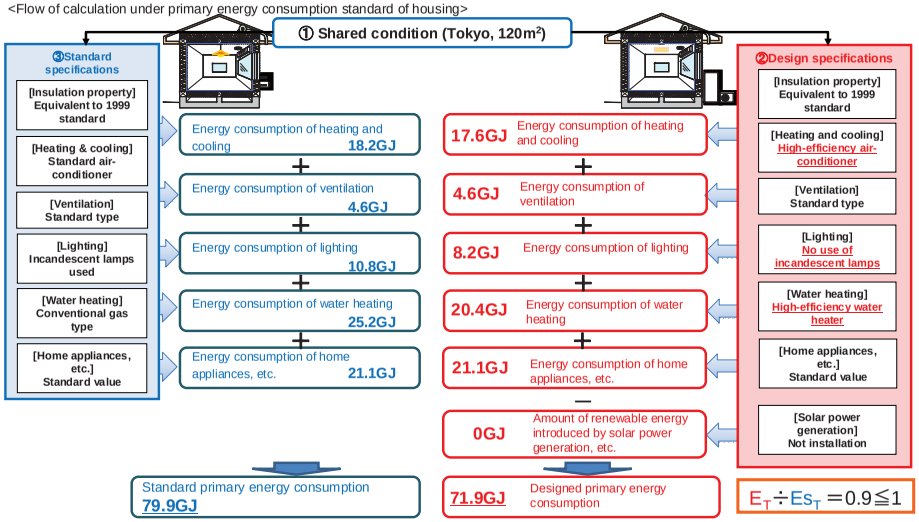
- More than 190,000 houses used the program in FY2011.(*3)
- More than 20 percent of new houses use the program.

(*3) calculated based on the issuance of designed housing performance assessment sheet.

Calculation based on Primary Energy Consumption Standard: An Example

- For example, a detached house with floor space of 120㎡ in Tokyo can achieve the standard by taking such energy saving measures as installation of high-efficiency air-conditioner and water heater:
  71.9GJ (designed primary energy consumption) ≦ 79.9GJ (standard primary energy consumption).
- Reduction of designed primary energy consumption by enhancing insulation property also enables meeting the standard.

<Flow of calculation under primary energy consumption standard of housing>



Heat Performance Standard that should be Satisfied by Exterior in Addition to Primary Energy Consumption Assessment

- Standard of exterior heat performance is set based on the view point of maintaining appropriate indoor temperature distribution that is not included in the assessment based on energy consumption such as heat shock and prevention of condensation. The current standard based on heat loss factor (Q value) is revised to a standard based on average outside heat transmission coefficient.
- Since the ratio of houses meeting the energy saving standard is just about 50 to 60 percent as a result of hosing eco-point program and since that of small and medium-sized builders that supply approx. 40 percent of detached houses is estimated to be still less than 50%, the standard used will be equivalent to that in 1999.

Conventional heat performance standard (standard based on Q value)

- Use standard based on Q value (heat loss per floor space) from the perspective of reduction of heat load (energy load)
- Present standard specifications that satisfy Q value (design, construction and maintenance policy)

$$\text{Q value} = \frac{\text{Total heat loss}}{\text{Floor space}}$$

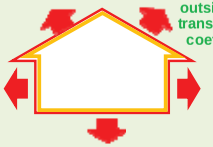
- Index to assess necessary energy due to heat loss

Problem

- Because the ratio of outside surface area to floor space is big in the case of small houses and houses of complicated shapes, more than 30cm insulator is sometimes needed to satisfy the Q value. (Current standard uses standard for small houses.)

Heat performance standard after revision (standard based on average outside heat transmission coefficient)

- Since reduction of energy consumption that is due to heat load (energy load) reduction is assessed in the calculation process of primary energy consumption, standard based on average outside heat transmission coefficient is used as the standard of outside heat performance.



$$\text{Average outside heat transmission coefficient} = \frac{\text{Total heat loss*}}{\text{Outside surface area}}$$

- Index to assess outside insulation property

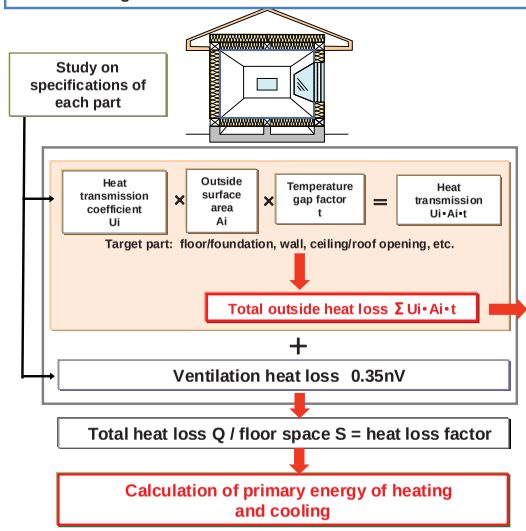
Response

- Use same standard value (average outside heat transmission coefficient) regardless of the size and shape of housing.
- When it is difficult to install insulators to satisfy the Q value since for example the houses are small, standard can be met by installing energy-saving equipment.

* Heat lost by ventilation and air leakage is not included.

Use of U Value and η Value Gained in Calculation of Primary Energy Consumption

- Primary energy consumption of heating and cooling is calculated using heat loss factor.
- Average outside heat transmission coefficient is calculated using the total outside heat loss used in calculating the heat loss factor.



	Conventional Index (Q, μ values)	New Index (Ue, ηe)
Small Houses	Excessive measures are called for (scale correction essential)	Scale correction not needed
Houses of Complicated Shape	Excessive measures are called for	Within proper extent
Big Houses	Achievable even with low-level performance	Certain level of insulation needed

[Standard value (new assessment index)]

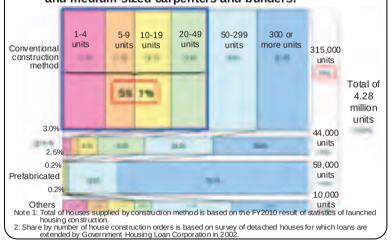
$$\frac{\text{Total outside heat loss } \Sigma Ui \cdot Ai \cdot t}{\text{Total outside area } \Sigma Ai} = \text{Average outside heat transmission coefficient } U_A$$

* Compared with conventional Q value, outside performance (insulation, heat blocking performance) is changed to be assessed with new index (average outside heat transmission coefficient) that is less affected by housing characteristics (scale, structure, shape, etc.).

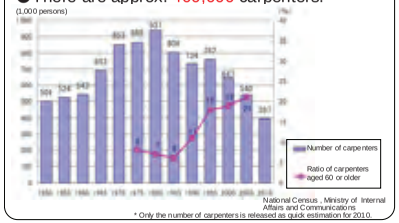
Training for Small and Medium-sized Builders to Improve Skills for Energy-Saving Design and Construction

- Carpenters and private builders are main suppliers of detached houses and yet are believed not to be fully familiar with energy-saving techniques.
- Training for 200,000 of 400,000 carpenters across the nation is provided to improve their skills for energy saving design and construction in the five years following the current fiscal year.

- Approx. 40 percent of detached houses are built by small and medium-sized carpenters and builders.



●There are approx. 400,000 carpenters.

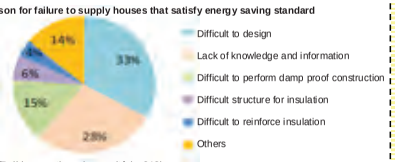


●Training for small and medium-sized builders and carpenters

<Problem>

It is believed that small and medium-sized carpenters and builders are not fully familiar with energy saving techniques due to difficulties and lack of knowledge and information on design and construction.

Technical reason for failure to supply houses that satisfy energy saving standard



[Builder questionnaire result] (n=218)

<Response>

Training is provided to 200,000 carpenters in the next five years to improve their skills in energy saving design and construction.

Regional council consisting of society of architects & building engineers, etc., is planned to provide the training at prefectural level from September.

[FY2012 Budget]

Program to Promote Zero-Energy Housing

FY2012 budget (Focused Measure for Revitalization of Japan) 2.31 billion JPY

In response to global warming and energy consumption growth in the civil sector, further extend and enhance efforts in the sector for energy saving by promoting zero-energy housings, introducing housing systems that contribute to zero-energy housing (i.e. combination of high-performance equipment and control mechanism) and assisting small and medium-sized builders' efforts for zero-energy housing.
(Joint program of Ministry of land, Infrastructure, Transport and Tourism and Ministry of Economy, Trade and Industry)

[Following is what the MLIT is responsible for]

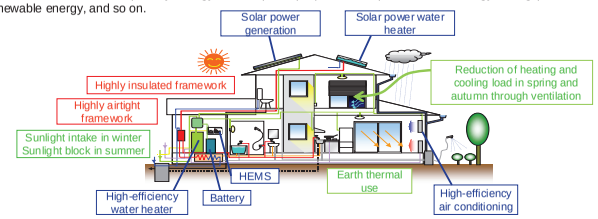
The national government invites suggestions from small and medium-sized builders. (evaluated by experts)

Efforts for zero-energy housing

(Main target of assistance: amount of additional cost occurred due to transformation into zero-energy housing, etc.
Assistance ratio: 1/2 (limit: JPY1.65 million/house))

Image of Zero-Energy House

Houses with zero or almost zero annual primary energy consumption (net) due to improvement in energy-saving performance of housing structures and facilities, use of renewable energy, and so on.



After the program, specifications of zero-energy houses, energy consumption during the course of occupancy and others will be monitored and made public.

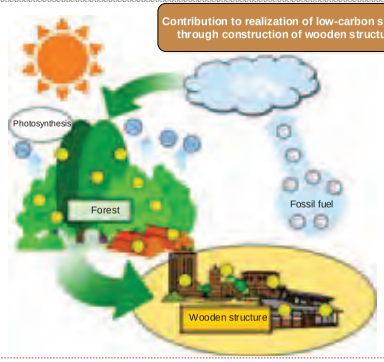
Program on Advanced Wooden Construction Technologies

FY2012 budget: part of 9 billion JPY

<<Purpose>>

Provide financial assistance for the construction of structures that use a large quantity of timber, a renewable resource, that use advanced design and construction techniques thereby contributing to realization of a low-carbon society.

Contribution to realization of low-carbon society through construction of wooden structures



◆FY2012 Phase 1 application acceptance
Period of acceptance of suggestions: May 18 (Fri.) to June 22 (Fri.), 2012 (acceptance closed)
⇒ **10 applications**
◆ FY2012 Phase 2 application acceptance
Applications will be accepted in summer to autumn. Details are announced on MLIT website after decided.
Inquiries: Evaluation and implementation office of program on advanced wooden construction technologies (within council for promoting wooden construction) (Website: http://www.sendo-shien.jp/24/)

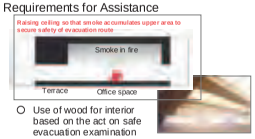
Applications for plans on the construction of wooden structure that satisfy the following requirements are invited and selected. Financial assistance will be provided for part of the construction cost or cost of the survey, design and planning for making the wooden structure.

<<Requirement to Receive Subsidy (advanced wooden structure) >>

- Introduction of advanced design and construction techniques for structure and fire prevention
- Leading building production system for using wood, including construction cost reduction by using original materials and unique construction method
- Structure of a certain scale that requires special legal measures, including Building Standards Act
- Facility with many users or public release of design and construction techniques, etc.

◆ Image of Structure that Satisfy Requirements for Assistance

○ Fire-resistant structure that uses wooden hybrid structural members



○ Use of wood for interior based on the act on safe evacuation examination

<<Amount of assistance>>

[Survey, design and planning cost]
Out of the survey, design and planning cost of the structure, 2/3 of cost related to making advanced wooden structure

[Construction cost]
2/3 of the amount of construction cost increased for making wooden structure (However, when it is difficult to calculate the increased construction cost, it can be 20 percent of the construction cost when it is wooden structure and 5% of the construction cost if it is lignification.

Technical Training in Japan on Climate Change Mitigation Actions
under JICA Technical Cooperation Project
"Capacity Development Project on Nationally Appropriate Mitigation Actions (NAMAs)
in the Republic of Serbia"

Visit to Panasonic Corporation

Agenda

- Date and time: 9:45am - 12:30pm, Friday, 2 November, 2012
- Venue: Main building and annex building (*Eco Idea House*), Panasonic Center Tokyo

* Consecutive Japanese-Serbian verbal interpretation is provided for each of following parts.

1. **Commemorative photo** (on the 1st floor of main building)…….…. 5 minutes

2. **Opening remarks** (on the 4th floor of main building)…..…..…….... 25 minutes

   - Greeting from JICA Expert Team
   - Explanation on the aim of trainees' visit to Panasonic Center Tokyo and introduction of trainees by JICA Expert Team
   - Greeting from Panasonic Corporation
   - Movie on corporate activities by Panasonic Corporation (in English. With supplementary explanation by Serbian)

3. **Tour of Panasonic Center Tokyo**.....…….…….…… 90 minutes

   - Part I: Section on smart city on the 4th Floor of main building (Concept of smart city, introduction of technologies by subject)
   - Part II: Annex building (Eco Idea House) (Introduction of the abstract, introduction of technologies by subject)

   *Around 45 minutes for each part.

4. **Exchange of opinions, etc** (on the 4th floor of main building).…….... 45 minutes

   - Introduction on corporate activities and factories of Panasonic Corporation in Europe
   - Questions and answers

Technical Training in Japan on Climate Change Mitigation Actions
under JICA Technical Cooperation Project
"Capacity Development Project on Nationally Appropriate Mitigation Actions (NAMAs)
in the Republic of Serbia"

Visit to Sony Corporation

Agenda

- Date and time: 2:00am - 4:00pm, Friday, 2 November, 2012
- Venue: Sony City Osaki

* Consecutive Japanese-Serbian verbal interpretation is provided for each of following parts.
* Photographs of equipment are allowed.

1. **Greeting from JICA Expert Team, introduction of trainees**
   (at conference room, 3rd floor) …….. 5 minutes

   - Greeting, explanation on the aim of visit to Sony Corporation and introduction of trainees by JICA Expert Team

2. **Greeting from Sony Corporation, introduction on activities by Sony Corporation**..... 35 minutes

   "Sony Group's Environmental Targets and Environmental Considerations for Office Buildings"

   By Takushi Tamura
   Corporate Workplace Solutions, Sony Corporation

3. **Tour of Sony City Osaki**…….. 60 minutes

   - Roof: Rooftop greening, solar power generation panels, and equipment of EcoCute
   - 7th floor (Balcony area on the south side): Solar power generation panels, and BIOSKIN on the outer wall
   - Disaster control center on 1st floor: Control system of BIOSKIN and air conditioning
   - 2nd basement: Heat sources management room (Turbo refrigerators, heat exchangers, etc.)
   - 2nd floor, and exterior of Sony City Osaki: Greening in the building site
   - Section of seismically isolated structure

4. **Questions and answers** (at conference room on the 3rd floor)…….... 20 minutes

Technical Training in Japan on Climate Change Mitigation Actions
under JICA Technical Cooperation Project
"Capacity Development Project on Nationally Appropriate Mitigation Actions (NAMAs)
in the Republic of Serbia"

Lecture by Yokohama City Government and visit to Minato Mirai 21 District Heating and Cooling Co., Ltd.

Agenda

- Date and time: 9:30am - 12:15pm, Monday, 5 November, 2012
- Venue: 5th floor and Center Plant of Minato Mirai 21 District Heating and Cooling Co., Ltd. (hereinafter mentioned as "MM21 DHC")

* Consecutive Japanese-Serbian verbal interpretation is provided for each of following parts.

1. **Opening remarks** (on the 4th floor of main building)…..…….... 5 minutes

   - Greeting, explanation on the objectives of the training
   - Introduction of trainees

2. **Lectures by Yokohama City Government**…….…….. 40 minutes

   "Yokohama Smart City Project"
   (*_Introduction of measures and actions by Climate Change Policy Headquarters, Yokohama City_)

   By Mr. Toshinori Mishima
   Climate Change Policy Headquarters, Yokohama City

3. **Greeting from MM21 DHC**…… 5 minutes

4. **Movie on corporate activities by MM21 DHC**……..... 25 minutes

5. **Tour of Center Plant of MM21 DHC**.....…….…….…… 60 minutes

6. **Questions and answers** (on the 4th floor of main building).……..... 30 minutes

Technical Training in Japan on Climate Change Mitigation Actions
under JICA Technical Cooperation Project
"Capacity Development Project on Nationally Appropriate Mitigation Actions (NAMAs)
in the Republic of Serbia"

Visit to Fuchu Factory, Toshiba Corporation

Agenda

- Date and time: 9:30am - 12:45pm, Tuesday, 5 November, 2012
- Venue: Fuchu Factory, Toshiba Corporation

* **PHOTOGRAPHS ON FUCHU FACTORY PROPERTY ARE NOT ALLOWED.**

1. **Opening remarks** (at conference room of Fuchu Factory)..... 5 minutes

   - Greeting, explanation on the aim of visit to Fuchu Factory of Toshiba Corporation by JICA Expert Team
   - Introduction of trainees by JICA Expert Team

   * Consecutive Japanese-Serbian verbal interpretation is provided for this part.

2. **Lecture by Toshiba Corporation** (with questions and answers)…….. 45 minutes

   - Movie on measures and actions by Fuchu Factory (in English)
   - Lecture on corporate measures and actions on smart community by Toshiba Corporation

   * Consecutive English-Serbian verbal interpretation is provided for lecture by Toshiba Corporation.

3. **Tour of Fuchu Factory**…… 60 minutes

   - Facilities for solar power generation (#11-5F)
   - Exhibition room on micro energy management system (μEMS) and advanced metering infrastructure (AMI)

   * Consecutive Japanese-Serbian verbal interpretation is provided for this part.

4. **Closing Remarks**…….. 10 minutes

   * Consecutive English-Serbian verbal interpretation is provided for this part.

5. **Lunch and rest** (scheduled at conference room of Fuchu Factory)..... 45 minutes

Technical Training in Japan on Climate Change Mitigation Actions
under JICA Technical Cooperation Project
"Capacity Development Project on Nationally Appropriate Mitigation Actions (NAMAs)
in the Republic of Serbia"

Lecture at Ministry of the Environment, Japan

Agenda

- Date and time: 10:00am - 12:00pm, Wednesday, 7 November, 2012
- Venue: Conference Room of Global Environment Bureau, Ministry of the Environment, Japan (17th floor of Daido Seimei Kasumigseki Building)

*Consecutive Japanese-Serbian verbal interpretation is provided for each of following parts.

1. **Opening remarks**…… 5 minutes

- Greeting and explanation on the aim of visit to Ministry of the Environment, Japan
- Introduction of trainees (by JICA Expert Team)

2. **Lectures**…… 80 minutes

- "Japan's Climate Change Policies"

  by Shuichiro Niihara

  Low-carbon Society Promotion Office, Global Environment Bureau, Ministry of the Environment, Japan

- "Voluntary Action Plan"
- "FY2011 Evaluation and Verification of the Voluntary Action Plan on the Environment: Results and Future Issues (provisional translation)"
- "Japan's policy on renewable energy deployment to mitigate climate change"

  by Takayuki Shigematsu

  Climate Change Policy Division, Global Environment Bureau, Ministry of the Environment, Japan

- "Outline of the Bilateral Offset Credit Mechanism (tentative name)"

  by Tappei Tsutsumi

  Deputy Director of Office of Market Mechanisms, Global Environment Bureau, Ministry of the Environment, Japan

3. **Questions and answers, exchange of opinions**…… 35 minutes

Voluntary Action Plan

- Each industry sets its own target and make an effort to achieve the target. The government evaluates/verifies the plans strictly through advisory councils, etc. in order to secure the achievement.
- Industries choose their targets based on either 1) CO2 intensity, 2) absolute CO2 reduction amount, 3) energy intensity, or 4) total energy consumption.
- Voluntary action plans are considered the main countermeasure in the Kyoto Protocol target achievement plan in industrial and energy-conversion sectors.

(Note) 114 industry sectors established (53 industry sectors, 42 business sectors, 17transportation sectors, 4 energy conversion sector) *as of June 2012

◆Outline of Progress(FY2011)

	Target Index	Base Year	Target Level	Performance in FY2008 (Compared to base year) ( ): Performance in FY2007 (Compared to base year)	CO_2 Emissions (10,000 tons-CO_2) (FY2008)	CO_2 Emissions (Compared to previous year)	CO_2 Emissions (Compared to base year)
Federation of Electric Power Companies of Japan	CO_2 emission intensity	FY1990	▲20%	▲16.1%(▲15.8%)	31,700 (3,100) Not integrated	+3.5%	+15.3%
Japan Iron and Steel Federation	Energy consumption	FY1990	▲10%	▲6.7% (▲17.2%)	18,602	+12.4%	▲7.3%
Japan Chemical Industry Association	Energy intensity	FY1990	▲20%	▲17% (▲15%)	5,980	+3%	▲3%
Petroleum Association of Japan	Energy intensity	FY1990	▲13%	▲16%(▲16%)	3,963	+1%	+28.1%
Japan Paper Association	CO_2 emission intensity Energy intensity	FY1990	▲16% ▲20%	▲24.0% (▲19.7%) ▲25.4% (▲22.1%)	1,840	▲3.9%	▲27.5%

◆ Amount of depreciation of Kyoto Mechanism Credits etc

Industry	Actual results in FY2010	Actual results in FY2009	Actual results in FY2008	Total
Federation of Electric Power Companies of Japan	57 million t-CO_2	52 million t-CO_2	64 million t-CO_2	173 million t-CO_2
Power Producers and Suppliers	137 thousand t-CO_2	238 thousand t-CO_2	85 thousand t-CO_2	460 thousand t-CO_2