

## **Annex 12 Presentation Materials for Technical Training in Japan**

## 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)

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## 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 Foresty Products Research Institute
- Ministry of Land, Infrastructure, Transport and Tourism

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## JICA's Assistance on Climate Change

October 30, 2012

Hiroshi ENOMOTO  
Deputy Director, Office for Climate Change,  
Japan International Cooperation Agency (JICA)

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Japan International Cooperation Agency

## 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.

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## 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

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◆**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.

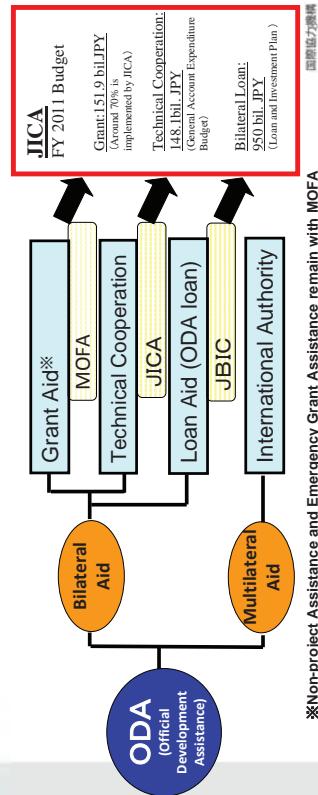


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### 1. About JICA

- 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.



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- New Mechanism(Bilateral Offset Credit Mechanism (BOCM) )

## 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) )

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## Framework of Adaptation Report



Chapter 3 Basic Concepts and Guidelines of GHG Emission Reduction (Sequestration)

- Basic Concept Evaluation
- Outlines the Baseline Sheet and Calculation Sheet
- Outlines the Methodology Sheet
- Outlines the Calculation Sheet

Chapter 4 Methodology Sheets and Calculation Sheets

Outline of Methodology and Calculation Sheets for Each Sub-sector

Methodology Sheet	Outline of Methodology and Calculation Sheets
1. Project outline	1. General concept
2. Baseline on emission reduction	2. Baseline on emission reduction
3. Methodology for GHG emissions reduction	3. Methodology for GHG emissions reduction
4. Data collection, emission estimation and monitoring	4. Data collection, emission estimation and monitoring
5. Data analysis methods	5. Data analysis methods
6. Other analysis methods	6. Other analysis methods
7. Project boundary	7. Project boundary
8. Baseline methodologies and major differences	8. Baseline methodologies and major differences
9. Baseline data sources	9. Baseline data sources
10. Energy saving	10. Energy saving
11. Thermal power generation	11. Thermal power generation
12. Electricity and heat supply	12. Electricity and heat supply
13. Thermal power with higher efficiency	13. Thermal power with higher efficiency
14. Power transmission with improved efficiency	14. Power transmission with improved efficiency
15. Renewable energy	15. Renewable energy
16. Rainwater harvesting	16. Rainwater harvesting
17. Hydro power	17. Hydro power
18. Wind power	18. Wind power
19. Proactive maintenance	19. Proactive maintenance
20. Water supply and drainage	20. Water supply and drainage
21. Landfill sanitation	21. Landfill sanitation
22. Landfill disposal of waste	22. Landfill disposal of waste
23. Intermediate treatment of waste	23. Intermediate treatment of waste
24. Orange treatment	24. Orange treatment

Calculation Sheet	Outline of Methodology and Calculation Sheets
1) Project Sheet	1) Project Sheet
2) Result Sheet	2) Result Sheet

Understanding future climate change

Baseline

Project

Future

Impact

Change

Impact

## 6. Example of Mitigation Impact Evaluation

(1) Transport, Energy, Waste Management

Greenhouse gas (GHG) Emission Reduction ( $ER_Y$ ) is the difference between without-project emission (Baseline Emission:  $BE_Y$ ) and without-project emission (Project Emission:  $PE_Y$ ).

$$ER_Y = BE_Y - PE_Y$$

Chapter 1 Selection of Target Sub-sectors
Target Sub-sectors
■ Past JICA ODA Loan Projects
■ Other ODA Donor
■ Vulnerability Assessment
■ Adaptation Project and Business-as-Usual Options
■ Monitoring and Evaluation
■ Renewable Data
■ Selection of Target Sub-sectors

- Chapter 2 Selection of Target Sub-sectors
- Categories of Technical Adaptation Measures
  - Past JICA ODA Loan Projects (Classification of projects from 1990 to 2010)
  - Integration of Sub-classifications into Targets by Other Donors
  - Selection of Target Sub-sectors

Chapter 3 Definitions and Steps in Adaptation Planning

- Baseline Concept
- Vulnerability Assessment and Business-as-Usual Options
- Monitoring and Evaluation
- Renewable Data
- Selection of Target Sub-sectors

Chapter 4 Selection of Target Sub-sectors

Category of Technical Adaptation Measures

- Past JICA ODA Loan Projects (Classification of projects from 1990 to 2010)
- Integration of Sub-classifications into Targets by Other Donors
- Selection of Target Sub-sectors

Chapter 5 Basic Concepts and Guidelines for Adaptation Measures

Structure of Sub-sector Profiles

Water Resources

Agriculture

Forests and Natural Resource Conservation

Disease Management

Urban-Regional Development

Transportation

Bridge, road and railway

Water Improvement

14. Sewerage and drainage

15. Medical facilities

16. Rural development

17. Irrigation

18. Wind power

19. Proactive maintenance

20. Landfill sanitation

21. Intermediate treatment of waste

22. Orange treatment

23. Sewage treatment

24. Rainwater harvesting

25. Thermal power with higher efficiency

26. Power transmission with improved efficiency

27. Thermal power generation

28. Electricity and heat supply

29. Thermal power with improved efficiency

30. Thermal power generation

31. BAU Development with Adaptation Options

Guideline

i) General concept

ii) Vulnerability

iii) Adaptation

iv) Necessary consideration for planning of adaptation measures

v) Required data

32. BAU Development with Adaptation Options

Guideline

i) General concept

ii) Planning adaptation options

iii) Necessary consideration for planning of adaptation measures

iv) Required data

33. BAU Development with Adaptation Options

Guideline

i) General concept

ii) Planning adaptation options

iii) Necessary consideration for planning of adaptation measures

iv) Required data

34. BAU Development with Adaptation Options

Guideline

i) General concept

ii) Planning adaptation options

iii) Necessary consideration for planning of adaptation measures

iv) Required data

35. BAU Development with Adaptation Options

Guideline

i) General concept

ii) Planning adaptation options

iii) Necessary consideration for planning of adaptation measures

iv) Required data

36. BAU Development with Adaptation Options

Guideline

i) General concept

ii) Planning adaptation options

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iv) Required data

37. BAU Development with Adaptation Options

Guideline

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iv) Required data

52. BAU Development with Adaptation Options

Guideline

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ii) Planning adaptation options

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iv) Required data

53. BAU Development with Adaptation Options

Guideline

i) General concept

ii) Planning adaptation options

iii) Necessary consideration for planning of adaptation measures

## JICA program: Highly Concessional Climate Change Japanese ODA Loan

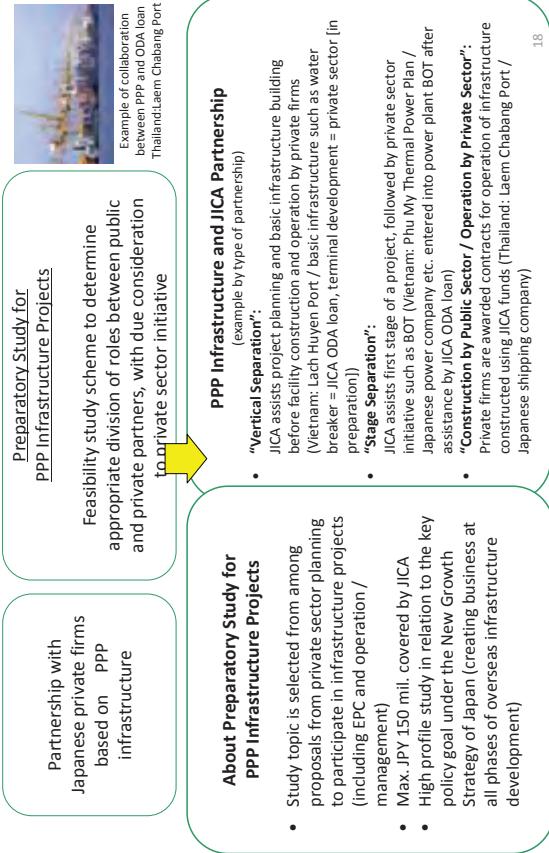
- Highly concessional compared to past preferential terms
- Candidate projects can be processed on a "Fast Track" basis (e.g., a loan request can be made at any time and is considered separately from ordinary projects).
- Provided to developing countries which make efforts to reduce GHG emissions and 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

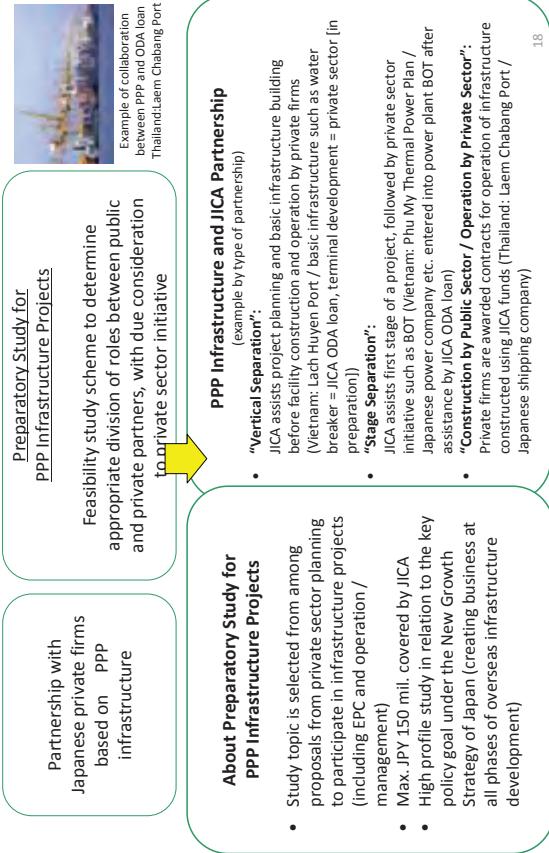
\* Option terms (interest rate and repayment/grace period) are available for each category (e.g. LDC may opt for 0.15% interest rate, 30(10) year repayment (grace) period.)

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## JICA program: Preparatory Study for PPP Infrastructure Projects



## JICA program: Preparatory Study for PPP Infrastructure Projects



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



## 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.



## 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.

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## 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.)

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## 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.



■ **Acceptance:** 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.

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## 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/kada/index.html#environment\\_energy](http://www.jst.go.jp/global/english/kada/index.html#environment_energy)

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## 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.



Photo : West Japan Engineering Consultants, Inc.

Loan

## 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 silicon and solar power , breeder construction of silicon and photovoltaic power plant and their effective utilization, feasibility studies on PV power transmission across the desert.



Loan

## 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

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## 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

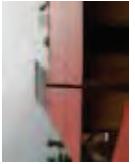


also alleviating air pollution and curbing green house gas emissions , establishing bus transportation system which includes construction of byways such as trunk roads, exclusive bus lanes and bus terminals.

Loan

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## ⑥ Basic Training for Introduction of Solar Power



Laos: Example of installation of solar power panel

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.

- 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
  - Promoting introduction of Japanese solar power / technologies through presentation during training
  - Promoting formulation of solar power projects financed by grant and loan aid of JICA
  - Promoting technical cooperation including dispatch of experts for establishing standards, institutions and policies related to solar power

Technical Assistance

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## 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

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## 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**

# 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

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## 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

2

## Innovative Strategy for Energy and the Environment

## Realization of green energy revolution

### OPath 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 Jitter)	390	-16 (-4%)	-31 (-8%)	-72 (-19%)

% = compare to 2010

### OPath 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)

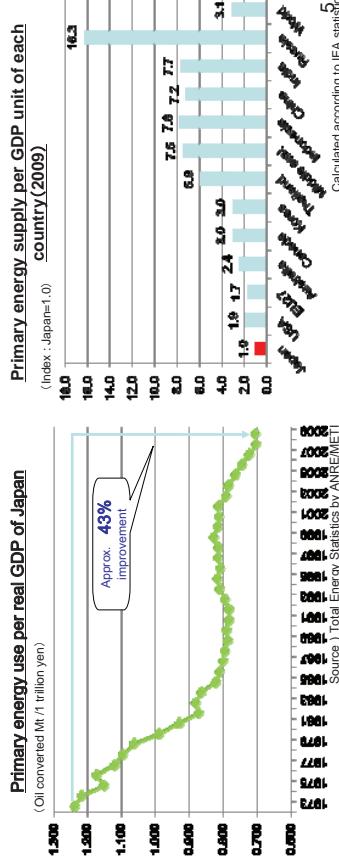
X times compared to 2010

## Energy Efficiency

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## 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.



- 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)

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## Historical Development of Energy Conservation Law



- 1947 Establishment of heat management
- 1979 Establishment of Energy Management Factories Guidance for Buildings and Appliances
- 1983 Amendment
  - Licensed energy manager system
- 1993 Amendment
  - Periodical reporting
- 1998 Amendment
  - Expand coverage of factories
- 2002 Amendment of Office Buildings
  - Energy Management of Office Buildings
- 2005 Amendment
  - Reporting System on Energy by Carriers
- 2008 Amendment
  - Company based regulation include franchised chains
- 2012 Amendment
  - Measure on demand-side peak demand load
  - Top Runner Program for Building Materials etc.

Promote energy efficiency of automobiles and household electrical appliances

- 1998 Amendment
  - Top Runner Program for automobiles and household electrical appliances
- 2005 Amendment
  - Amendment on Energy by Carriers

- **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.**



- Measure on demand-side peak demand load
- Top Runner Program for Building Materials etc.

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## Japan's Energy Efficiency Policy

## 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)

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## Japan's Energy Efficiency Policy

### <Regulations>

#### C. Houses/Buildings

##### 'Ensuring the energy efficiency through mandatory report by:

- **Constructors:** measures on energy conservation for newly constructed houses/buildings
- **Owners:** measures on preservation/maintenance (applied for houses/buildings with total floor space more than 300m<sup>2</sup>)
- Requiring 10% efficiency improvement to House Suppliers** on total energy consumption of new residential houses (by 2013FY)

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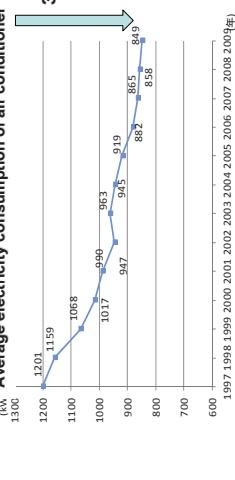
## Japan's Energy Efficiency Policy

### <Regulations>

#### D. Automobiles/Electronic Appliances

##### - **"Top Runner" Program**

Target products : **23** products



## Ministry of Economy, Trade and Industry

### SETSUDEN (power saving) Campaign, Summer 2011

Standard Format for Action Plan



Menu of Electricity Saving by Households



### SETSUDEN (power saving) Campaign, Summer 2011

AC on newspaper



Menu of Electricity Saving by Households



### SETSUDEN (power saving) Campaign, Summer 2011

Standard Format for Action Plan

Menu of Electricity Saving by Households



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### SETSUDEN (power saving) Campaign, Summer 2011

Standard Format for Action Plan

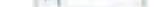
Menu of Electricity Saving by Households



### SETSUDEN (power saving) Campaign, Summer 2011

Standard Format for Action Plan

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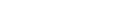
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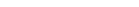
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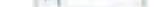
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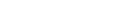
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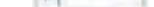
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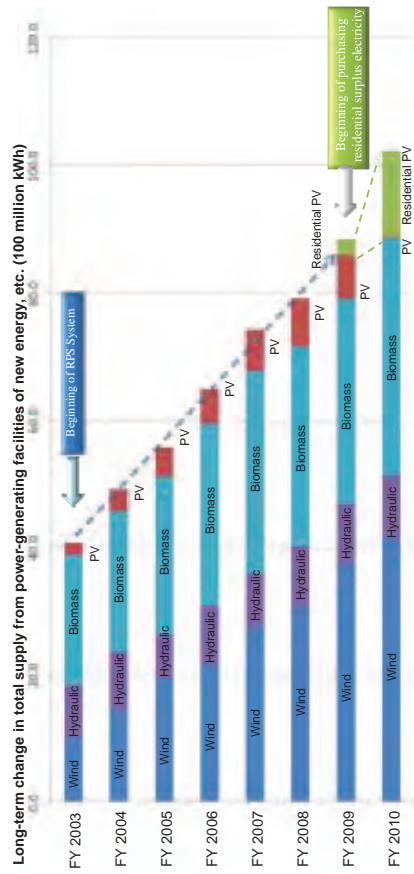
Standard Format for Action Plan

Menu of Electricity Saving

# 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.

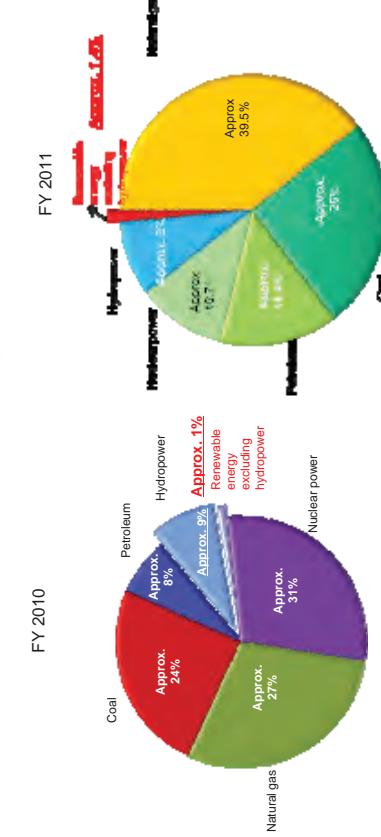


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## Current Composition of Power Sources in Japan

- 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.

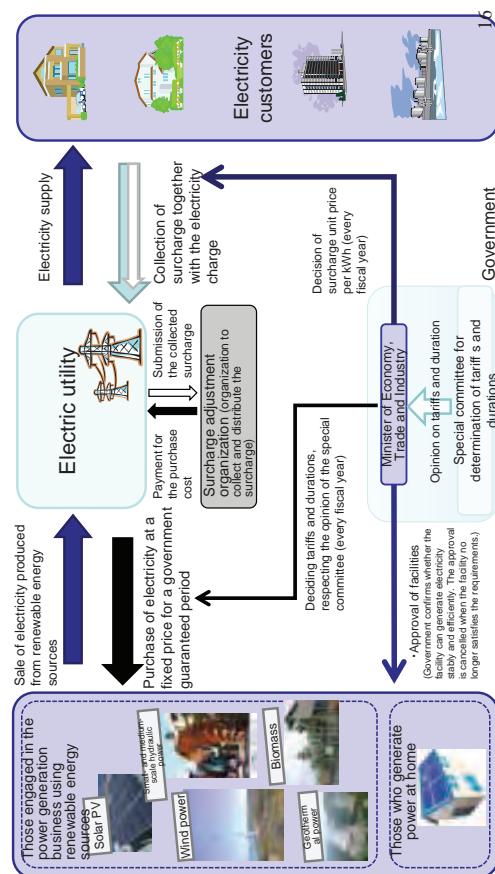
Composition of annual electricity generated in Japan



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 economy, 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.



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## 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. 0.35GW	+ 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

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## Smart Communities

<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. 0.35GW	+ Approx. 0.02GW (Estimate by METI)
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Geothermal	Approx. 0.5GW	+ 0GW
Total	Approx. 19.45GW	+ Approx. 2.5GW

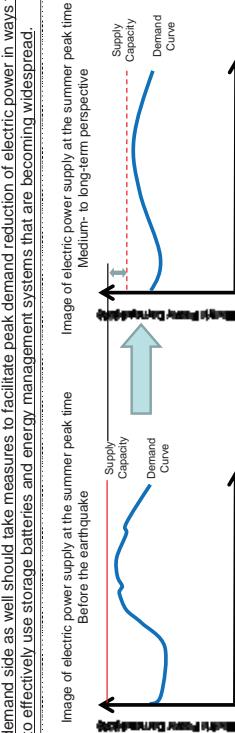
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### Changes after the Great earthquake

- 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 light 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.

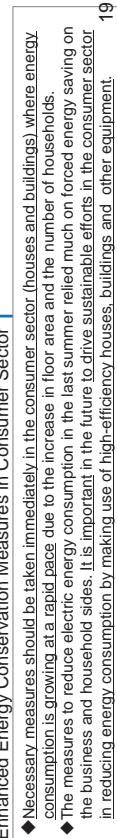


### Smart Houses

- 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).

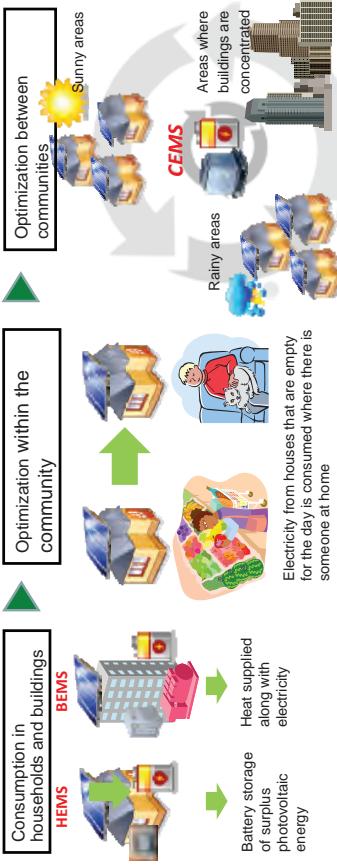
- Storage of electricity in household storage batteries and electric vehicles; discharge of such electricity (24h).



20

## 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.



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## 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  
Example of technology cooperation:  
Waste heat power generation at a cement plant

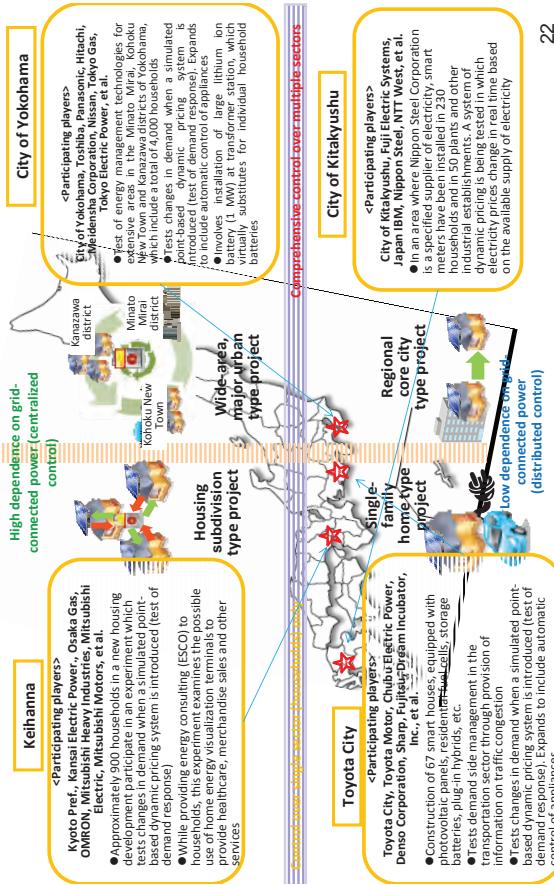


Cooperation with Malaysia  
✓EE measures being discussed with energy authority staff from Malaysia  
✓Japanese legislation, regulations, measures, etc. being introduced and studied

Demonstration at a cement plant in China  
✓Waste heat power generation technology was demonstrated in 1995 - 1997

✓The technology has been widely spread in the country after the completion of the demonstration

### Test Projects for Next-generation Energy and Social Systems



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### 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:

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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 technology cooperation



Demonstration at a cement plant in China  
✓Waste heat power generation technology was demonstrated in 1995 - 1997  
✓The technology has been widely 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

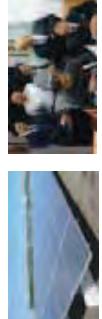


Cooperation with the Philippines  
 ✓RE measures being discussed with energy authority staff from the Philippines  
 ✓Japanese measures to promote RE being introduced and studies

25

- ✓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.

Large scale PV system



### Example of technology cooperation

#### 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

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- ✓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, headquartered in Paris
- ✓8 WGs are established and in active operation

25

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



Ministry of Land, Infrastructure, Transport and Tourism

## Contents of the presentation

1. Current state of GHG emissions in Japan
2. Trends of energy and environmental measures in Japan
3. Measures against global warming in the areas of land and transport



2

## CO<sub>2</sub> emissions in the world

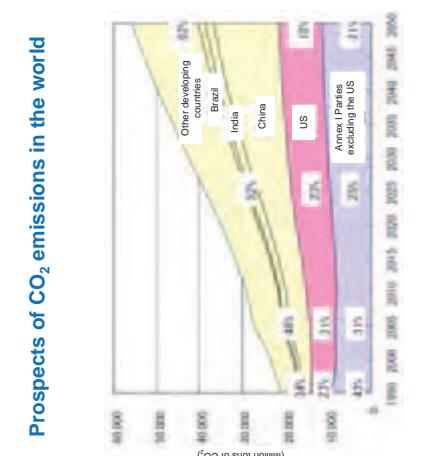
### Share of energy-derived CO<sub>2</sub> emissions by country (2009)

Prospects of CO<sub>2</sub> emissions in the world

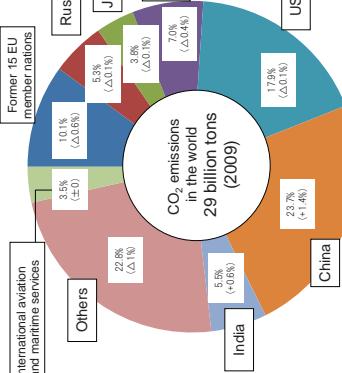
Ministry of Land, Infrastructure, Transport and Tourism  
November 1, 2012



Ministry of Land, Infrastructure, Transport and Tourism



CO<sub>2</sub> emissions in the world  
29 billion tons (2009)



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

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

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

Commitment Period of Kyoto Protocol (Fiscal year (1990 in principle) to 2010)

Fiscal year (2008 to 2012)

Base year (1990 in principle)

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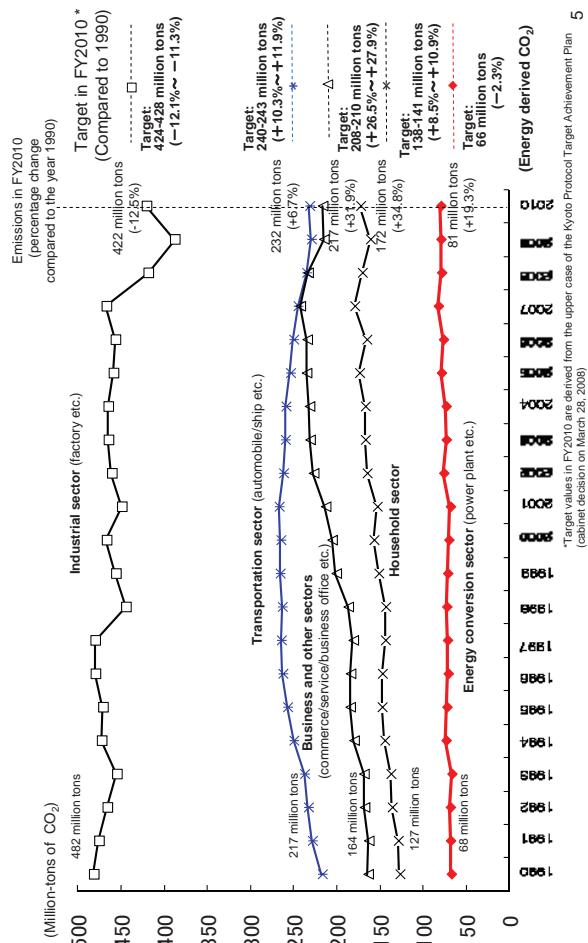
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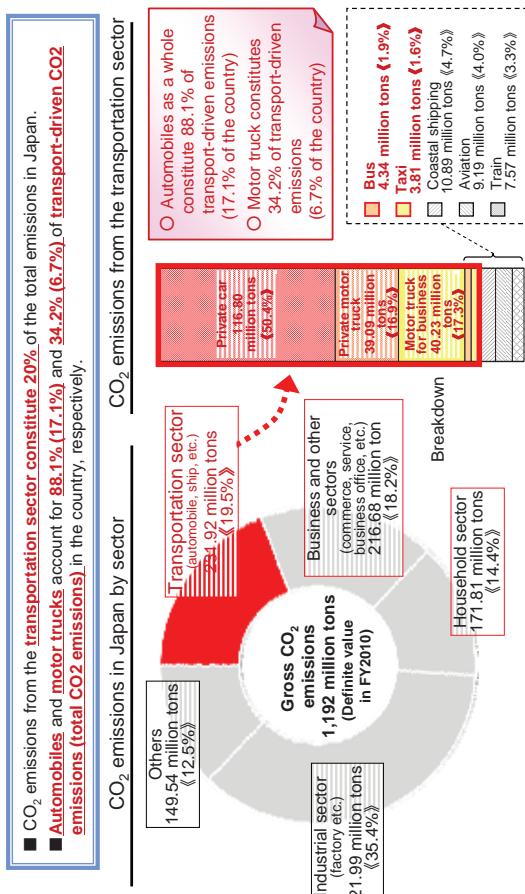
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## Trend and target of greenhouse gas emissions by sector



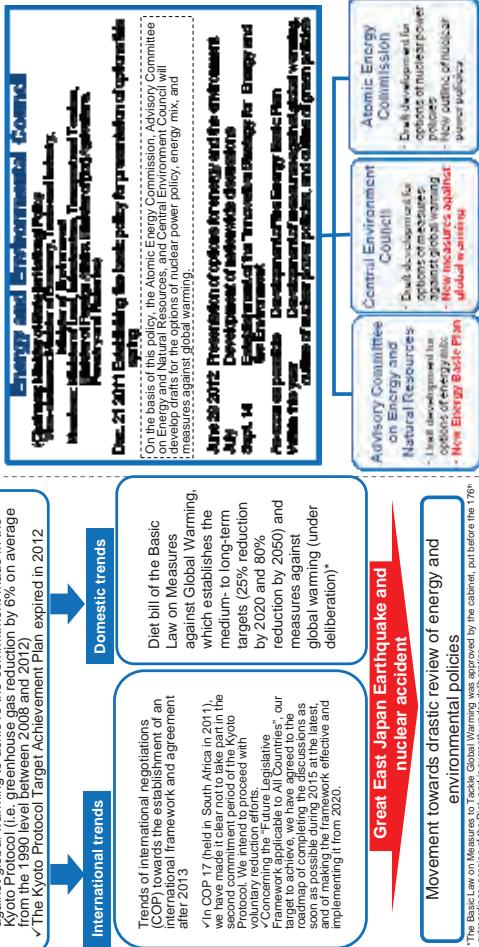
CO<sub>2</sub> emissions from the transportation sector in Japan

CO<sub>2</sub>-emissions from the transportation sector in Japan



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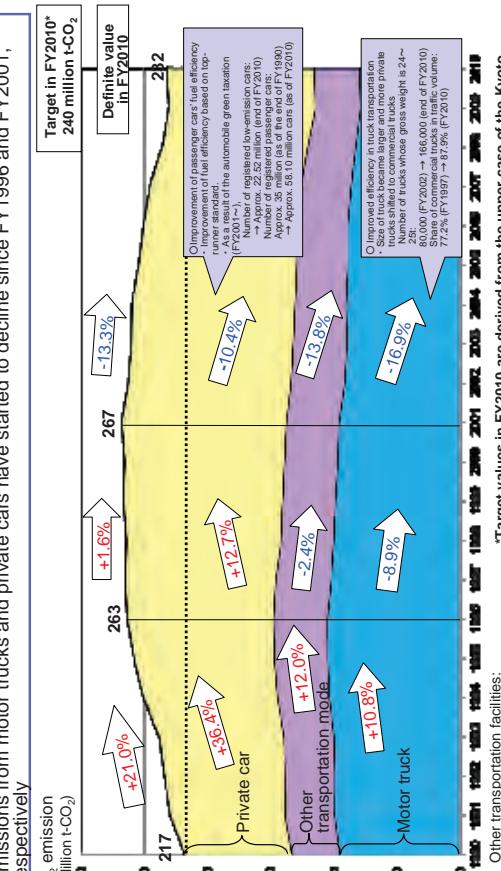
国土资源遥感监测



<sup>a</sup>Emissions that derive from 'power companies' electricity generation and 'heat supplies' heat generation are allocated to the final demand based on their level of consumption.  
<sup>b</sup>Prepared by the Environment Policy Division of MLIT based on the "National Greenhouse Gas Inventory Report of Japan" of the Greenhouse Gas Inventory Office of Japan.

## CO<sub>2</sub> emissions in the transportation sector

- reaching its peak in FY2001, emissions from the transportation sector have shown a decline



\*Target values in EVOM0 are derived from the upper case of the Kyoto rotation facilities:

**Movement towards drastic review of environmental policies**

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

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

**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 basic urban characteristics and condition of the sustainable urban 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
- In the case of immediate energy demand-supply, realization of the low-carbon society needs highly integrated development by approaching smart, strategic, and energy-saving urban areas and transport as a whole in 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.**
- In this case, efforts will be made to make each form of the community, convenience, and industrial productivity with the environment.**

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

**In the case of immediate energy demand-supply, realization of the low-carbon society needs highly integrated development by approaching smart, strategic, and energy-saving urban areas and transport as a whole in 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.**

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

**With the aim of conservation from the mass consumption type society to the resource saving society, environmental management in the course of consumption behavior of the people and enterprises production activities will be promoted.**

**In this case, efforts will be made to make each form of the community, convenience, and industrial productivity with the environment.**

\* Environment Group, Traffic System Subcommittee of Traffic Policy Council, Social Capital Development Council, Ministry of Land, Infrastructure, Transport and Tourism ([http://www.mlit.go.jp/policy/shingikai/sos\\_kankyo/c01.html](http://www.mlit.go.jp/policy/shingikai/sos_kankyo/c01.html))

## Promotion of development and dissemination of environmentally-friendly vehicles

**Promotion of development and dissemination of environmentally-friendly vehicles**

The principal measure in the automobile sector, which accounts for approx. 20% of the total CO<sub>2</sub> 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

## Development of fuel efficiency standards

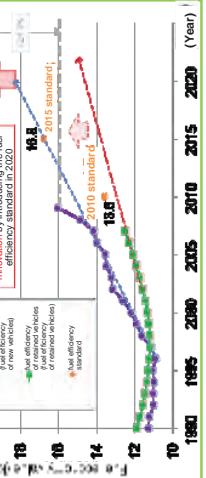
### ■ Development of ambitious standards

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

Oil fuel efficiency standard for heavy vehicles established for the first time in the world in 2006

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

Trend of improvement in average fuel efficiency in new passenger cars and oil efficiency in related cars



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

## Promotion of optimum utilization of vehicles

**Promotion of optimum utilization of vehicles**

In addition to measures for new vehicles, it is important to create an environment that promotes optimum use of vehicles and dissemination of environmental characteristics

- 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

**Promotion of development using environmentally-friendly vehicles**

The way of driving vehicles with less impact on the environment has been making possible to reduce CO<sub>2</sub> not only new vehicles, but also rearname vehicles. Awareness raising and promotion of eco-drive by means of EVs (electric vehicle) and EVS (electric vehicle support equipment).

- Along with full-scale dissemination of EVs, energy management is integrated between vehicles and households/businesses
- Charging EVs
- Power supply system
- Power generation system
- Power generation system

**Promotion of eco-drive**

Promotion of development and dissemination of extra-small mobility through inter-sector cooperation between urban development and vehicles in extra-small mobility, highly convenient vehicles in public transportation and bicycles.

- Promotion of energy saving driving of vehicles by promoting eco-drive
- 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<sub>2</sub> 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

**Dissemination of EV by linking it with households/businesses**

- Easy energy conservation management at the household/businesses
- 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

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

**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.

## Measures to ensure traffic flow

### 国土交通省

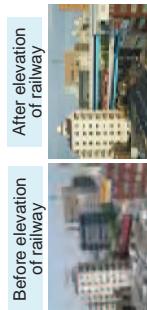
## Promotion of the use of public transportation

- Smooth traffic flow will raise traveling speed, which in turn improves fuel efficiency and reduces CO<sub>2</sub> 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 promoted, and bottleneck crossing should be eliminated to further reduce CO<sub>2</sub> emissions

### Principal countermeasures

#### Development of a bicycle-friendly environment

#### Elimination of bottleneck crossings and others



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

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## Heightened energy use efficiency of railway

### 国土交通省

## Improvement of energy use efficiency of ships

### 国土交通省

- 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

### Advanced



### Railway with less environmental load

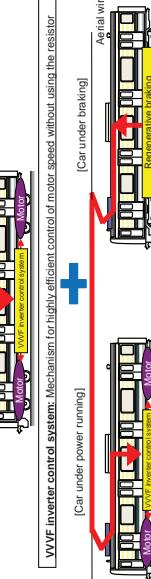


### Tax support for promotion of introduction of energy conservation type cars

[Applicable car (example)]

#### Existing car

#### New car



- \* 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 high-efficiency internal combustion engine 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 dealt with here.)

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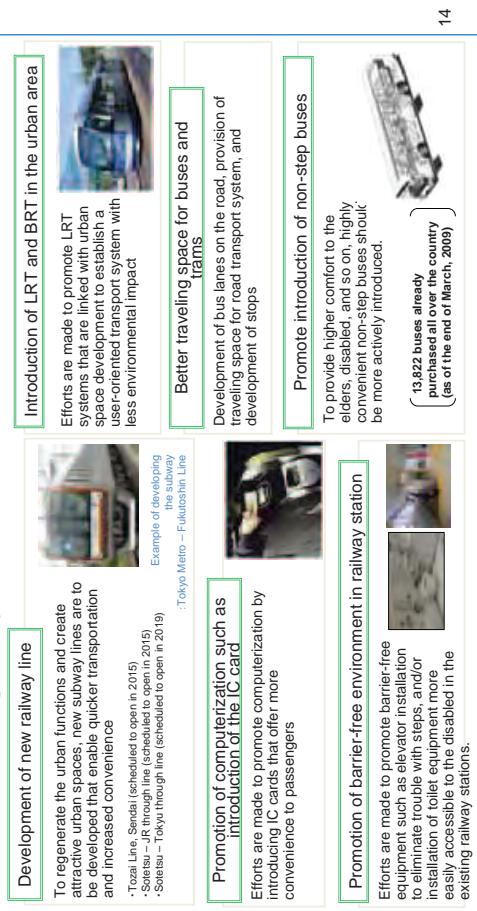
## Reduction of CO<sub>2</sub> emissions from ships

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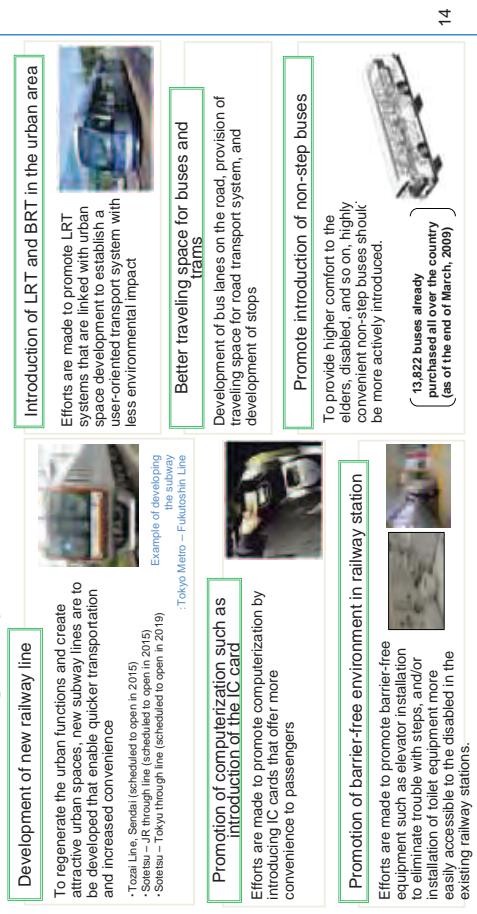
- Promotion of the use of public transportation with less environmental impact by increasing their convenience

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



- 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



## Improvement of energy use efficiency of aviation

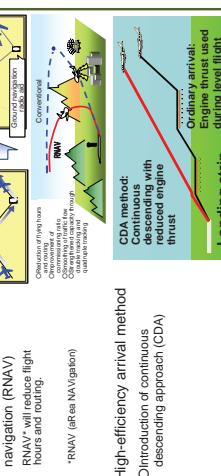


### Promotion of dissemination of environmentally-friendly vehicles

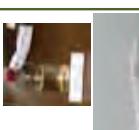
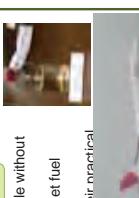


#### Measures through introduction of new technology (example)

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

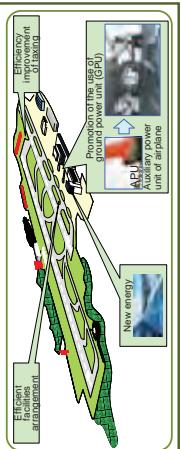


#### Measures through utilization of alternative fuel (example)

- Highly efficient navigation method
- Introduction of area navigation (RNAV) <RNAV> will reduce flight hours and fueling.
- RNAV (Green NAV/green)
- High-efficiency arrival method
- Introduction of continuous descending approach (CDA) 
- Various tests including flight tests for their practical implementation
- Flight test conducted by Japan Airlines in 2009 

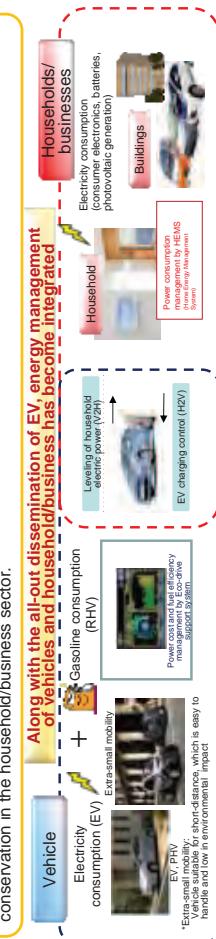
#### Measures through improvement of airport facilities (example)

- Promotion of the use of ground power unit (GPU)
- Suppression of CO<sub>2</sub> 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



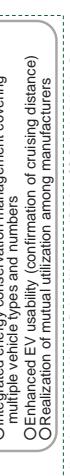
### Integrated approach to promote CO<sub>2</sub> emissions reduction and energy conservation between vehicles and the household/business sectors

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 CO<sub>2</sub> emission reduction and energy conservation in the household/business sector.



#### Effective and efficient utilization of car-mounted batteries

- Effective use of EV's battery for purposes other than running with particularly high feasibility, effectiveness, and pioneering features which is easy to handle and low environmental impact
- Principal issues necessary for selection of the project

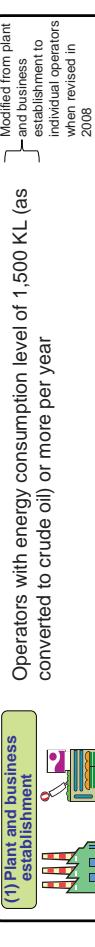


Implemented in conjunction with the Advance Project of Housing and Buildings CO<sub>2</sub> Reduction - Housing Bureau

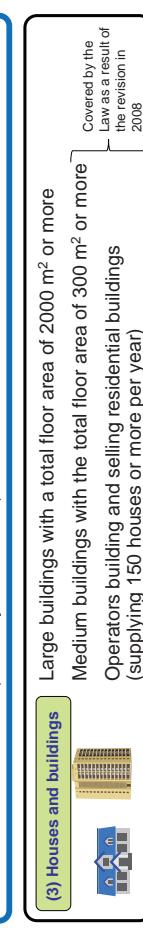


### Fields subject to regulation under the Energy Use Law

- 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



- Modified from plant and business to individual operators when revised in 2008
- Operators with energy consumption level of 1,500 kL (as converted to crude oil) or more per year
- ◆ 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)



- Covered by the Law as a result of the revision in 2008
- Large buildings with a total floor area of 2000 m<sup>2</sup> or more
- Medium buildings with the total floor area of 300 m<sup>2</sup> or more
- Operators building and selling residential buildings (supplying 150 houses or more per year)
- 23 items including passenger cars, air conditioners, TV sets, etc. (accounting for about 80% of power consumption in households)

## Regulations in the Energy Use Law (transportation sector)

### Criteria for transport operators

#### 国土交通省

- 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

##### On 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
- 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 1,300 railway cars, 200 trucks,  
20,000 gross tons or larger ships.
- 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)

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

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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**

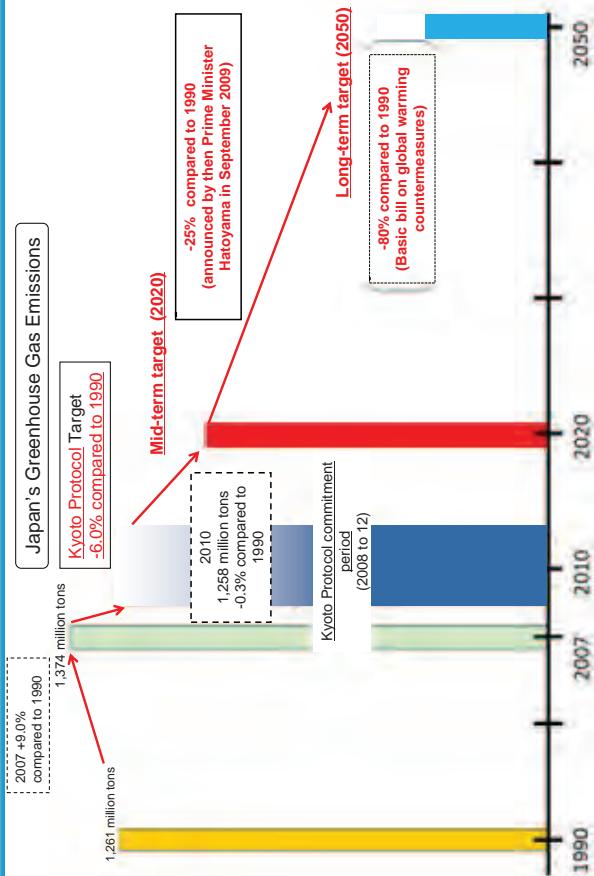
• Development of an in-house system for energy conservation

- 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)]

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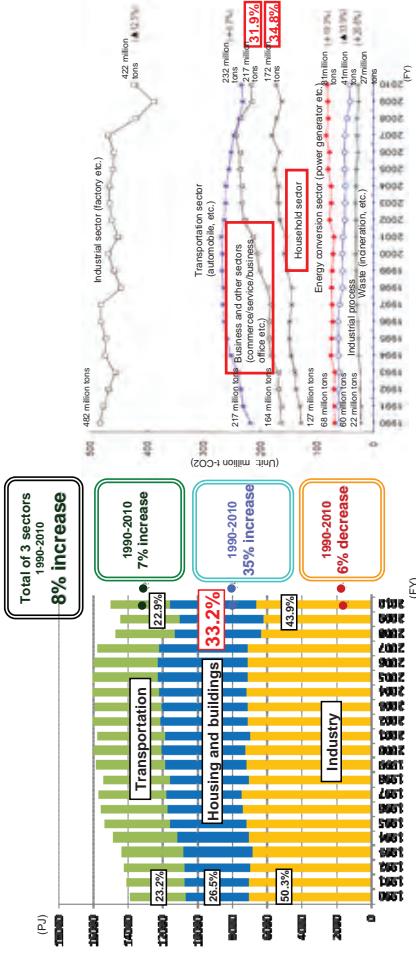
## GHG Emissions Trend and Mid- to Long-Term Target in Japan



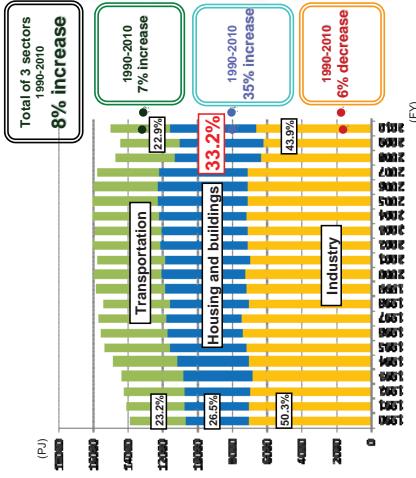
## Trend of Energy Consumption and CO<sub>2</sub> Emissions in Housing and Buildings

- 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.
- CO<sub>2</sub> emissions of the housing and buildings sector have also increased significantly than other sectors.

### [Trend of CO<sub>2</sub> Emissions]



### [Trend of Final Energy Consumption]



## Environmental Measures for Housing and Buildings

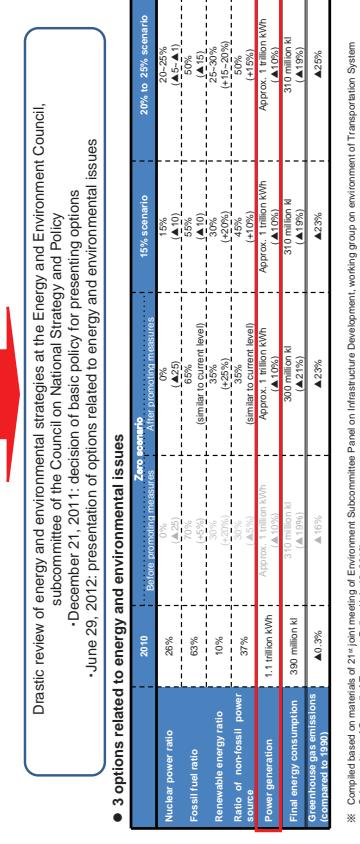
Housing Bureau,  
Ministry of Land, Infrastructure, Transport and Tourism



## 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

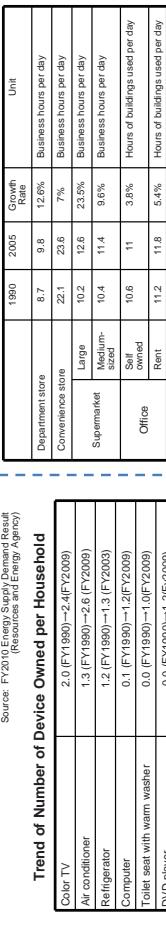
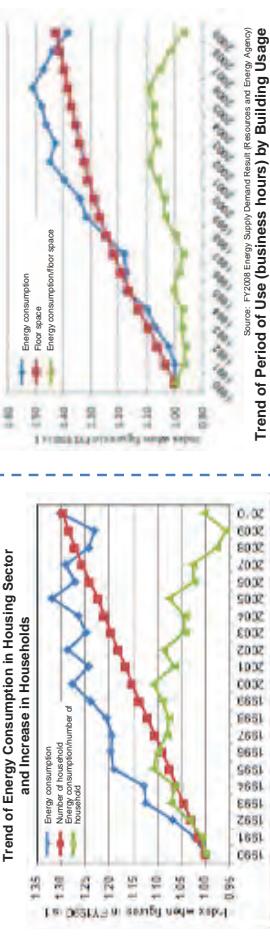


## Main Causes of the Increase in Energy Consumption in Housing and Buildings

### □ 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 Households and Floor Space



Source: F'2010 Energy Survey (Demand, Supply, Resources and Energy Agency)

Date released by Association of Department Stores and Japan Chain Stores Association on energy consumption by large businesses in Tokyo

Unit: Business hours per day

Source: Ministry of Economy, Trade and Industry (MEXT)

Report on business energy consumption in Kansai region survey on energy consumption by large businesses

In Tokyo

4

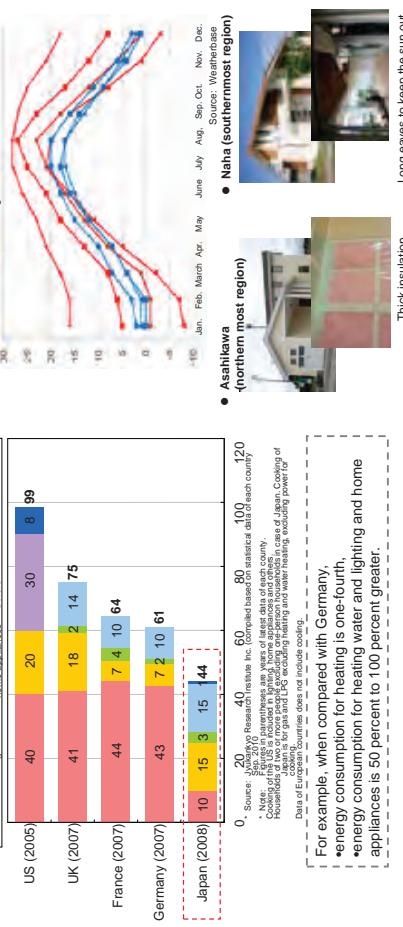
## Comparison of Energy Consumption per Household in the World

### □ Buildings

- 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.



Average Monthly Temperature in Japan and Germany



5

## Past Energy Saving Efforts in Housing and Buildings

### 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 prefectoral 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 m<sup>2</sup> or more → 300 m<sup>2</sup> 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	Safety Measures when Energy Saving Efforts are Significantly Insufficient
Large buildings (2000m <sup>2</sup> or more)	Notification required	Instruction, announcement, order, penalty (fines of 1 million or less)
Medium buildings (less than 2000m <sup>2</sup> )	Notification required	Recommendation (no penalty)
Small buildings (less than 300m <sup>2</sup> )	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)

Category		1970 ~	1980 ~	1990 ~	2000 ~	2010 ~
• 1979 - Energy Saving Act (obligation to make best efforts)						
Regulations based on Energy Saving Act						
①						
② Labeling and information offering on energy saving						
③ Incentives						

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(Estimated based on certain assumptions by MHLW)

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## 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: Keiji Aoki, former chair, Zenkenen  
Kell Kimura, Director, Real Estate Companies Association of Japan  
Yuko Saito, Representative director/Chair, Research Institute of Innovative Technology for the Environment  
Keiko Sakurai, professor, Faculty of Law, Gakushuin University  
Go Tamura, advisor, National Federation of Construction Workers' Unions  
Hiroyuki Nakagami, professor, Integrated Research Institute, Tokyo Institute of Technology, Managing director, Jyukankyo Research Institute  
Bent Nielsen, professor, Faculty of Engineering, Keio University  
Takeshi Hashimoto, Chairman, Federation of Housing Organizations  
Representative chair and CEO, Daiwa House Industry  
Katsu 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, honorees omitted)

### 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 houses and buildings
  - Promotion of CO<sub>2</sub> emissions reduction through overall lifecycle
  - Realization of benefit of comfort, etc., through CO<sub>2</sub> 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
  - Promotion of model projects in disaster-affected areas, etc.
  - Development of working style and facility
3. Policy to promote "good" living style"
  - Introduction of system to promote changes of lifestyle including working style
  - Introduction of system to promote effective use of sustainable energy
  - Promotion of efforts for low-carbon action through visualization of living and life style performance
  - Promotion of proper selection based on labeling of housing and buildings and facility
  - 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

1st session (June 2010)  
2nd session (November 2010) Sonning out points of discussions  
3rd session (October 2011) Discussions based on Great East Japan Earthquake  
4th session (April 2012) Interim report (draft)

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### Meeting History

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

## 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
- Careful consideration to medium-sized and small builders and carpenters
- Study based on opinions that traditional wooden houses would not be built if the compliance with energy saving standard is imposed on low-carbon society
- Promotion of improvement of measures related to new construction, enhancement of stock and future human resources development to realize low-carbon society

[Issues to be solved for meeting the requirements]

- Clarification of balance with energy saving regulations on housing and buildings in other sectors and countries
- Careful consideration to medium-sized and small builders and carpenters
- Study based on opinions that traditional wooden houses would not be built if the compliance with energy saving standard is imposed on low-carbon society

[Issues to be solved for meeting the requirements]

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## 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 of home appliances, etc.) is more than 10 percent below the energy saving standard of Energy Saving Act (\*).

- Measures are taken to contribute to reducing carbon emissions.

### Introduction of HEMS

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

### Use of timber

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

### Measures against heat island

- Measures, which include planting on premises, rooftop and wall.

- Measures to curb heat island

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

## 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 (ministries of land, infrastructure, transport and tourism, environment and economy, trade and industry)
- Certification of private low-carbon buildings, etc.

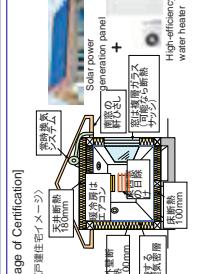
### Income and Other Tax Reduction for Low-Carbon Housing[1]

Year of Residences	Lowering of maximum amount of income tax registration fee	Storage (0.5% general)	Transportation (0.5% general)	Registration (0.3% general)
2012	4.0 million JPY	0 million JPY (gen. eq.)	0.5% (gen. eq.)	0.3% (gen. eq.)
2013	3.0 million JPY	0.2 million JPY (gen. eq.)	0.4% (gen. eq.)	0.2% (gen. eq.)

[Not included in calculation of floor-area ratio]

Floor space exceeding regular building floor space related to low-carbon building (battery, heat storage tank, etc.)

### Image of Certification



[\*]

[†]

[‡]

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## 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 standards>

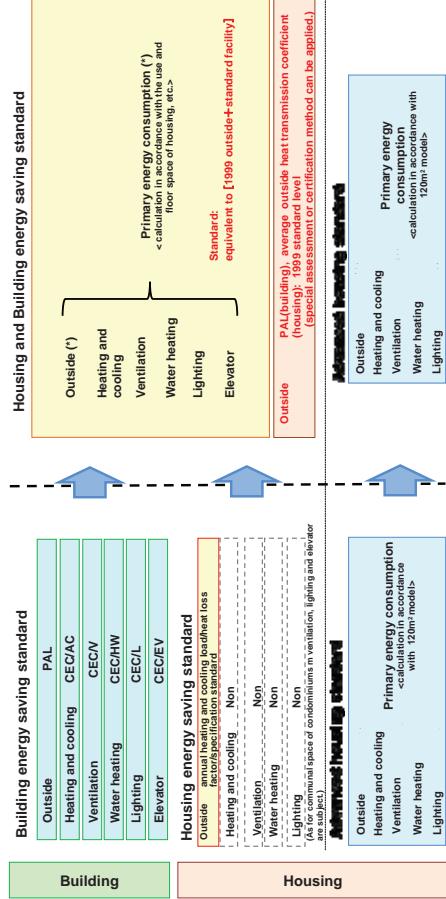
- Since the standard is to assess outside insulation property only, it is impossible to assess the property of heating and cooling, water heating and lighting that all have significant energy saving effects.
- Only energy saving property of 120m<sup>2</sup> model housing can be assessed with the advanced 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 method 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 (1993 level) of housing and buildings is required to be met in principle.
- Because the large year of the advanced housing standard is in FY2013, current standard is maintained in principle.



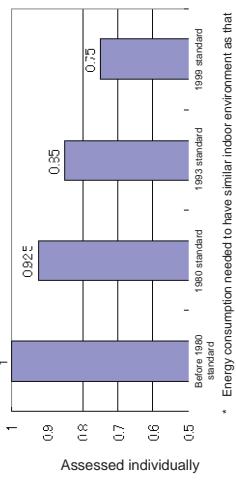
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## Review of Energy Saving Standard of Buildings (housing excluded) (draft)

### 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.
- Enhancement of exterior wall insulation property, using insulation, etc.
- All-conditioner
- Improvement of efficiency of air-conditioner and heat source equipment, etc.
- Lighting
- Utilization of high-efficiency lighting, etc.
- Ventilation
- Water control device, water heater, etc.
- Water heater
- Use of high-efficiency water, etc.
- Elevator
- Utilization of speed control system, etc.

Established in 1980 and enhanced gradually in 1993 and 1999.



### Energy saving standard after review

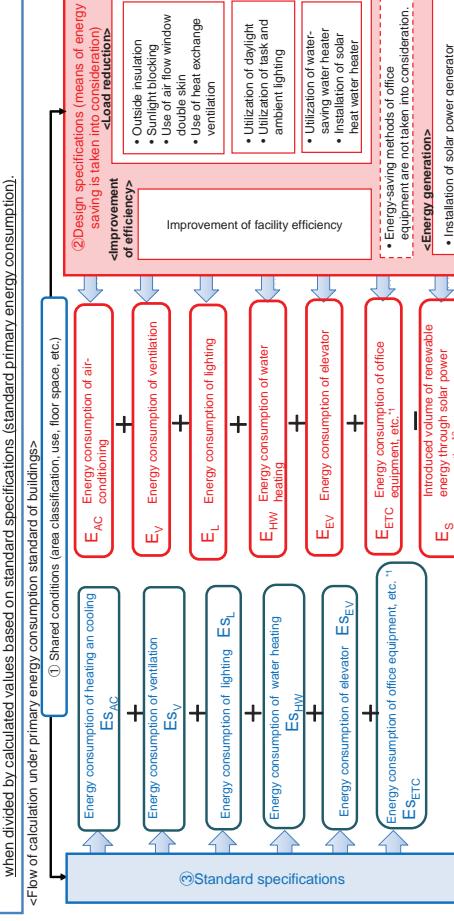
- Standard on primary energy consumption
- Comprehensive assessment of insulation property of exterior wall and windows, efficiency of air conditioning, lighting, ventilation, water heating, elevator facilities, and efforts for energy generation, including solar power generation.

$$\left[ \begin{array}{l} \text{Index of primary energy consumption} \\ \times E_{\text{eff}} \rightarrow \text{OO} \text{ (Digital value)}^2 \end{array} \right]$$

○ To be implemented in FY2012

## Idea of Primary Energy Consumption Standard of Buildings

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



- Energy saving methods of office equipment, etc.  $E_{EFC}$
- Energy generation  $E_S$ 
  - Energy saving methods of office equipment, etc.  $E_{EFC}$
  - Installation of solar power generator
- Designed primary energy consumption  $E_{Tr}$

\*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.

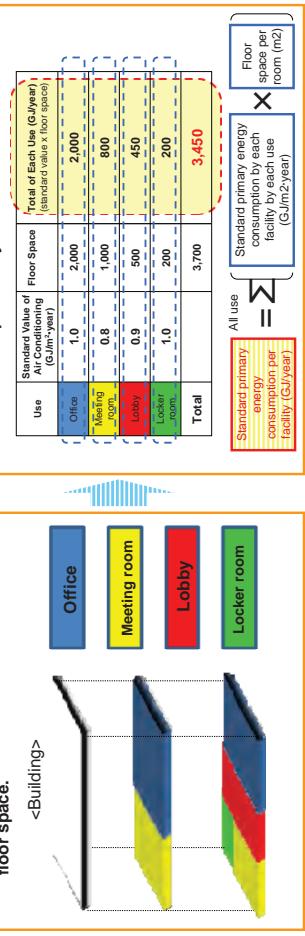
\*2 Energy generated by cogeneration facility is included.

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## 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.



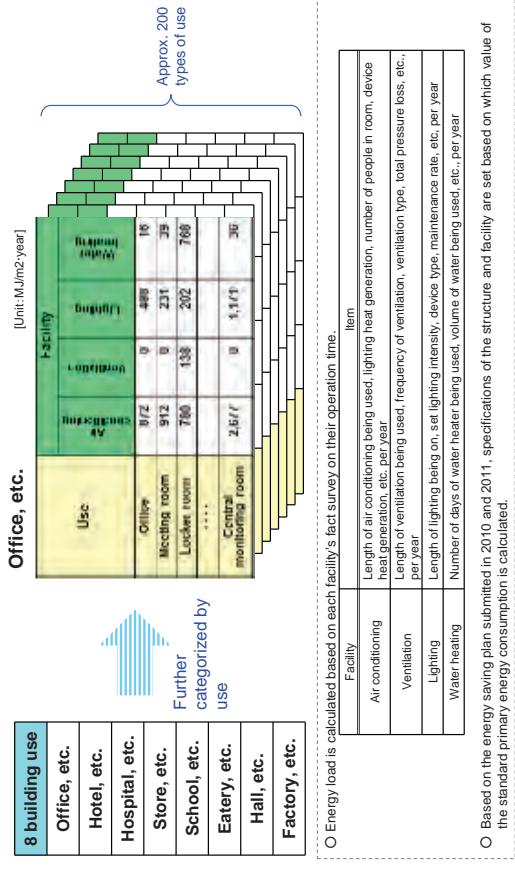
③ Add up standard primary energy consumption of each facility to calculate that of the entire building.

$$\text{All facility} = \sum \text{Standard primary energy consumption per facility (GJ/year)}$$

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## 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)



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## 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>

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

Primary energy consumption of other equipment (home appliances, OA equipment, etc.) + Automatic calculation based on floor space and use

Calculation based on assessment of outside insulation capacity and facility performance

② Calculation 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.

③ Calculation of self consumption

Self consumption is considered zero when selling electricity while self consumption is considered 100% when not selling electricity.

④ Housing

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

(1) Examine the matter to have rate following the future as the increase of self consumption, when battery is installed, calculate a statistic for the increase of self consumption.

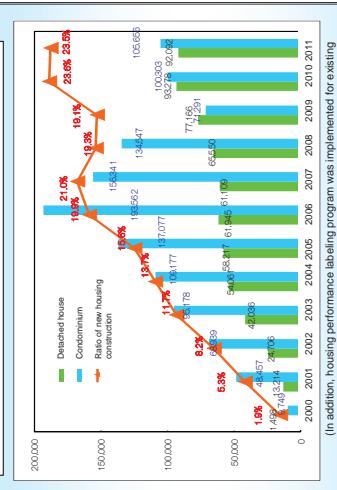
⑤ Primary energy consumption

④ subtract ③ from ① to calculate primary energy consumption.

## Overview of Housing Performance Labeling Program

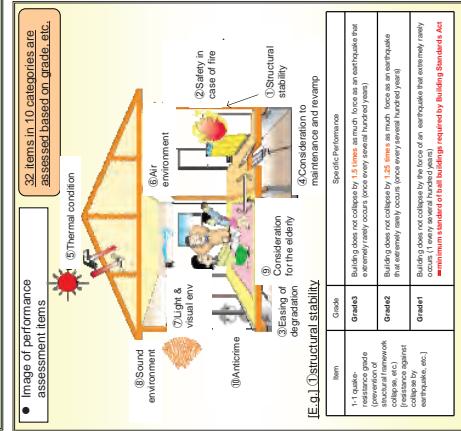
Housing performance labeling program is related to basic housing performance which is:  
 • Based on common rules, performance assessment items, performance assessment criteria set by the national government,  
 • impartial and neutral third-party organizations (registered housing performance assessment organization)  
 • assesses 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  
 (\*) limited to construction housing performance assessment sheet

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



- More than 190,000 houses used the program in FY2011.<sup>(\*)</sup>
- More than 20 percent of new houses use the program.

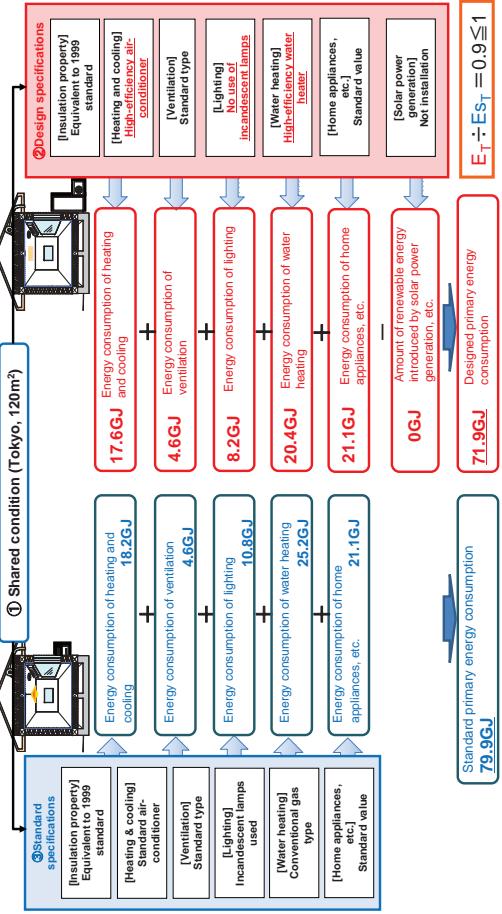
(\*) Calculated based on the statistics of designated housing performance assessment sheet.



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## Calculation based on Primary Energy Consumption Standard: An Example

- For example, a detached house with floor space of 120m<sup>2</sup> 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)  $\leq$  79.9GJ (standard primary energy consumption).
  - Reduction of designed primary energy consumption by enhancing insulation property also enables meeting the standard.



## Use of U Value and $\eta$ 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.

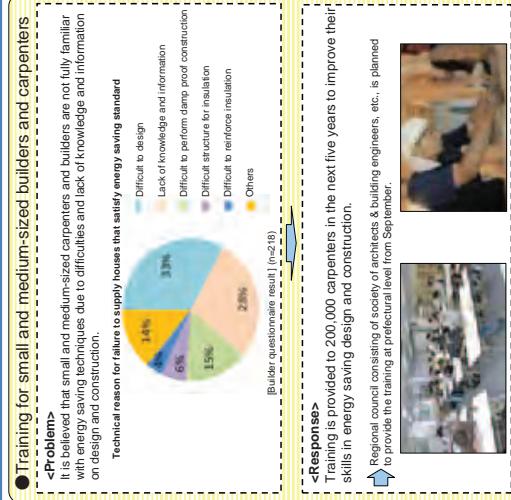
[Standard value (new assessment index)]		
Total outside area $\Sigma A_{\text{out}}$	Total outside heat loss $\Sigma U \cdot A_{\text{out}} \cdot t$	Average outside heat transmission coefficient $U_{\text{avg}}$
Small Houses	Conventional Index x (Q, $\mu$ values)	New Index ( $U_e$ , $\eta_e$ )
Houses of Complicated Shape	Excessive measures are called for (scale correction essential)	Scale correction not needed
Big Houses	Excessive measures are called for (scale correction essential)	Within proper extent
	Achievable even with low-level performance	Certain level of insulation needed

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

**Calculation of primary energy of heating and cooling**

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

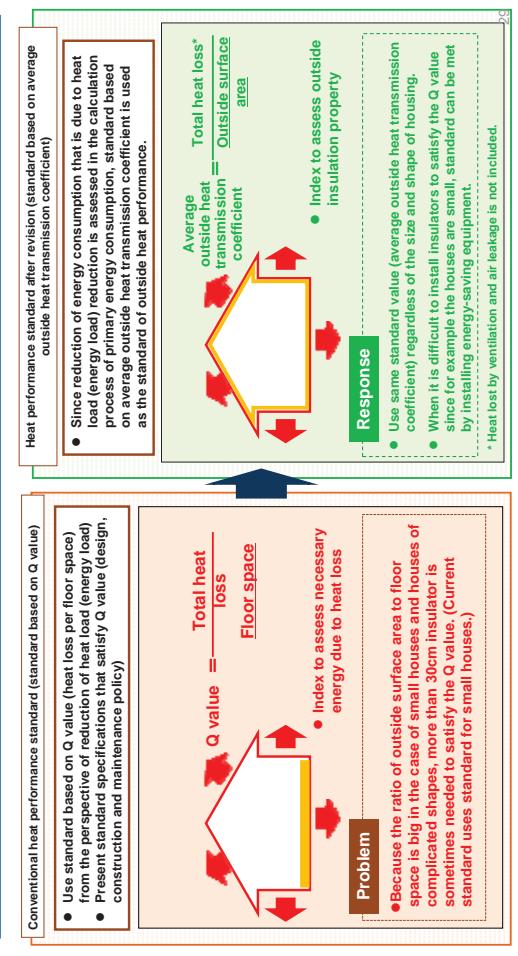
- Carpenters and private builders are main suppliers of detached houses and yet are believed not to be fully familiar with energy-saving techniques.
  - Training for 200,000 of 400,000 carpenters across the nation is provided to improve their skills for energy saving design and construction in the five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



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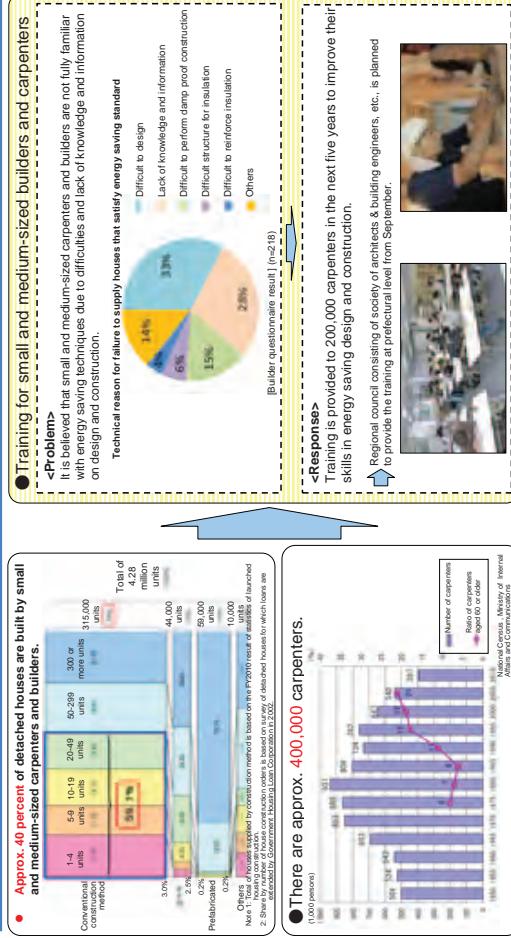
## **Heat Performance Standard that should be Satisfied by Exterior in Addition to Primary Energy Consumption Assessment**

- 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 energy outside house transmission coefficient.
  - Since the ratio of houses meeting the energy saving standard is just about 50 to 60 percent as a result of housing eco-point program and since that of small and medium-sized builders that supply about 40 percent of detached houses is estimated to be still less than 50%, the standard used will be equivalent to that in 1999.



## **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.



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## [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 housing, 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)

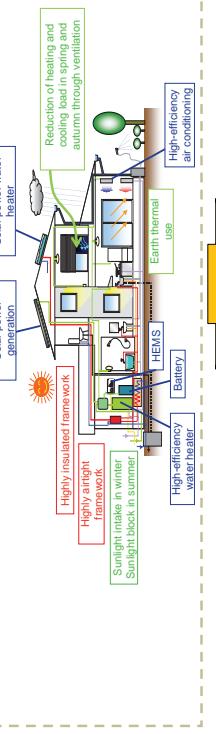


Efforts for zero-energy housing

Main target of assistance: amount of additional cost occurred due to transformation into zero-energy housing, etc.  
Assistance ratio: 1/2 (limit: JPY 1.65 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 1 of 9 billion JPY

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)>>

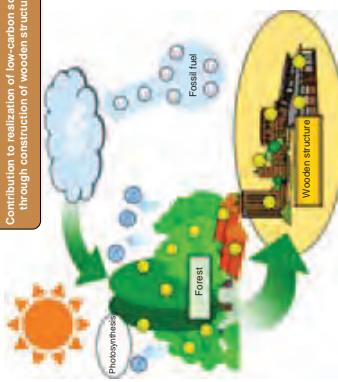
- Introduction of advanced design and construction techniques for structure and fire prevention
  - Leading building production system for using wood, including construction cost reduction by using original materials and unique construction method
  - Structure of a certain scale that requires special 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
- 

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<<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



<<Amount of assistance>>

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 a wooden structure and 5% of the construction cost if it is lignification.)

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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 1<sup>st</sup> floor of main building)..... 5 minutes

**2. Opening remarks** (on the 4<sup>th</sup> 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 4<sup>th</sup> 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, 3<sup>rd</sup> 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 3<sup>rd</sup> 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: 5<sup>th</sup> 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 4<sup>th</sup> 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 4<sup>th</sup> 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 ( $\mu$  EMS) 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) CO<sub>2</sub> intensity, 2) absolute CO<sub>2</sub> 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, 17 transportation 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 <sub>2</sub> Emissions (10,000 tons-CO <sub>2</sub> ) (FY2008)	CO <sub>2</sub> Emissions (Compared to previous year)	CO <sub>2</sub> Emissions (Compared to base year)
				CO <sub>2</sub> Emission intensity	CO <sub>2</sub> Emission intensity			
Federation of Electric Power Companies of Japan	CO <sub>2</sub> emission intensity	FY1990	▲20%	▲16.1% (▲15.8%)	▲16.7% (▲17.2%)	(3,100) Not integrated	+3.5%	+ 15.3%
Japan Iron and Steel Federation	Energy consumption	FY1990	▲10%	▲17% (▲15%)	18,602		+12.4%	▲7.3%
Japan Chemical Industry Association	Energy intensity	FY1990	▲20%	5,980			+3%	▲3%
Petroleum Association of Japan	Energy intensity	FY1990	▲13%	▲16% (▲16%)	3,963		+1%	+28.1%
Japan Paper Association	CO <sub>2</sub> 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 <sub>2</sub>	52 million t-CO <sub>2</sub>	64 million t-CO <sub>2</sub>	173 million t-CO <sub>2</sub>
Power Producers and Suppliers	137 thousand t-CO <sub>2</sub>	238 thousand t-CO <sub>2</sub>	85 thousand t-CO <sub>2</sub>	460 thousand t-CO <sub>2</sub>