

## Section 2. Measures to Cope with Global Warming Issues

### 1. Circumstances around global warming issues

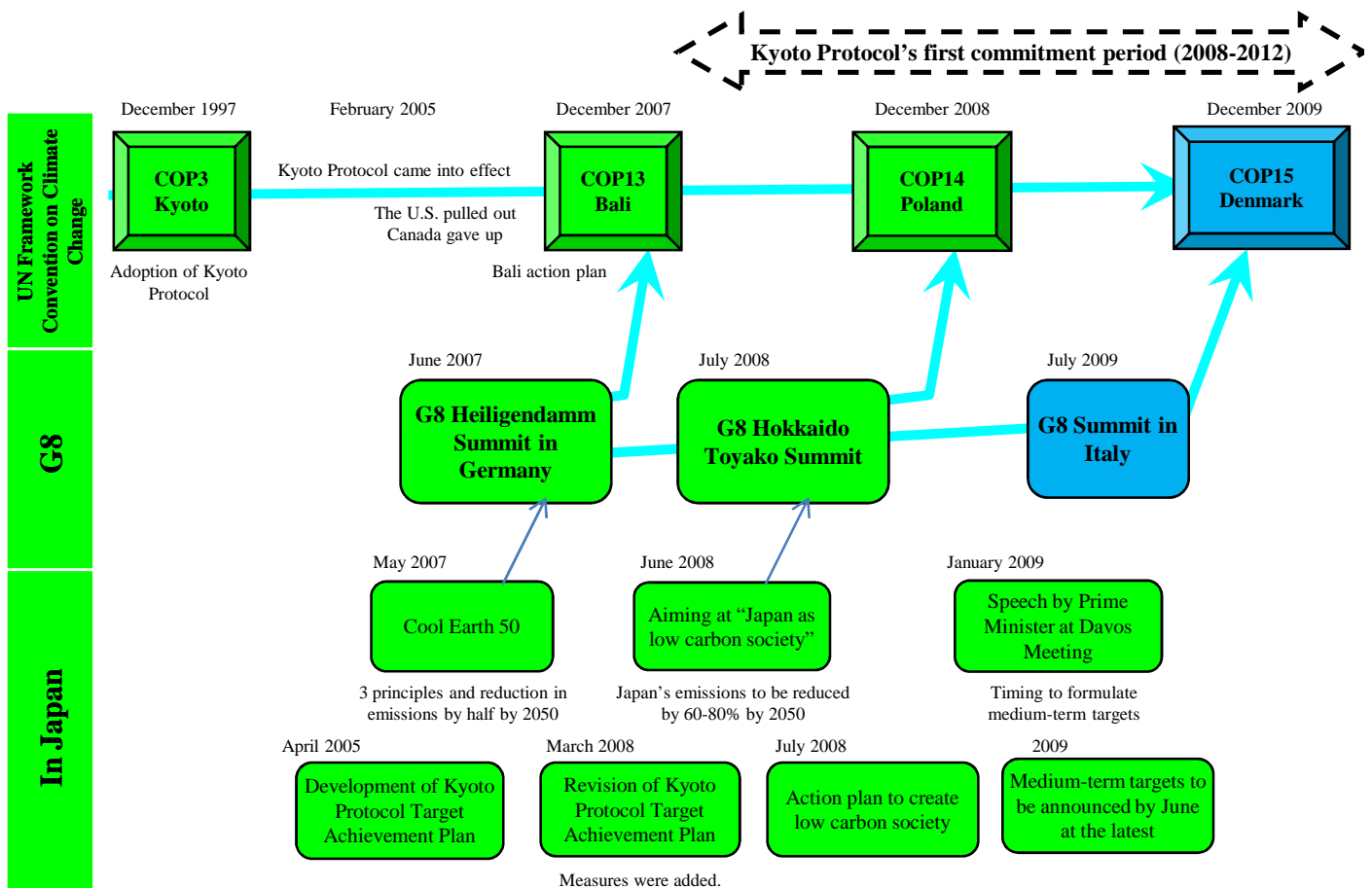
The first commitment period prescribed by the Kyoto Protocol

- The first commitment period prescribed by the Kyoto Protocol started in 2008.
- Japan strengthens efforts to achieve its commitment to reduce emissions by 6% from the level of the base year.

Post Kyoto Protocol framework

- Japan exercised its leadership in international negotiations at G8 Hokkaido Toyako Summit and other meetings and actively contributed in this field.
- In preparation for COP15, full-scale international negotiations for post Kyoto Protocol framework are underway in earnest.

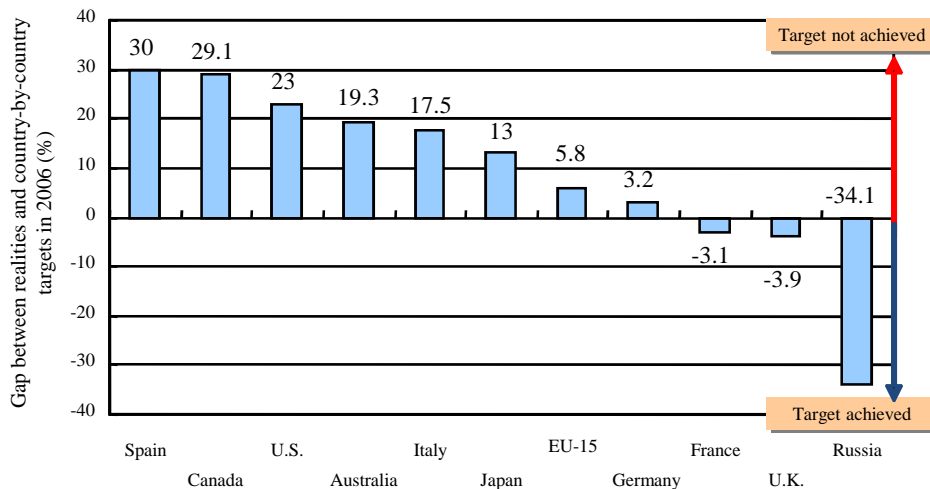
Figure: Developments to Date and Schedule until the End of 2009



## Current status of and outlook for CO2 emissions in the world

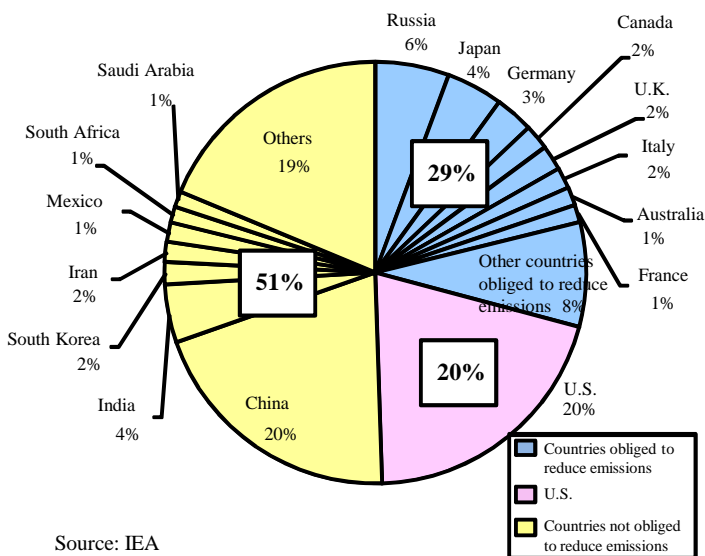
- The countries obliged to reduce emissions under the Kyoto Protocol account for 30% of the world's total greenhouse gas emissions.  
(Reduction targets of major countries: Japan (-6%), EU (-8%) and Russia ( $\pm 0\%$ )
- Largest emitting countries, i.e., the U.S., China and India, are not obliged to reduce their emissions.
- Participation of all major emitting countries is important, and the leadership of Japan that leads the world in the energy-saving, new energy and nuclear energy technologies is deemed important.

**Figure: Major Countries' Progress in Achieving Targets Prescribed by Kyoto Protocol (2006)**



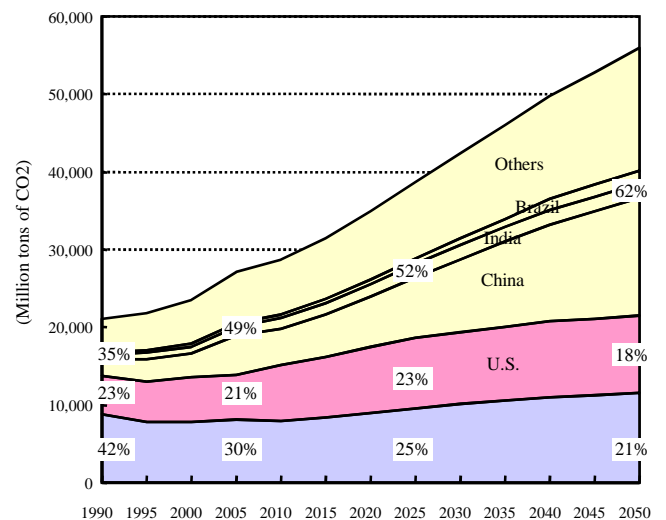
Source: Developed based on data of UN Framework Convention on Climate Change (UNFCCC).  
(The plus portions in 2006 results represent the portions in excess of target values.)

**Figure: CO2 Emissions of Energy Origin in the World (2006)**



Source: IEA

**Figure: Outlook for CO2 Emissions in the World**



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

## 2. Japan's approaches to reduce greenhouse gas emissions

### (1) Kyoto Protocol Target Achievement Plan

- The government decided upon the “Kyoto Protocol Target Achievement Plan” at the Cabinet and revised it in March 2008.
- It was announced that the 6% reduction commitment prescribed by the Kyoto Protocol could be achieved, if people of all social standings fully address the measures and initiatives prescribed by the plan. (The guide for CO2 emissions of energy origin in FY2010 was set at an increase of 1.3% to 2.3% from the total emissions in the base year.)

Table: Yardstick for Greenhouse Gas Emissions in FY2010

	Indicative emissions in FY2010 <sup>(Note)</sup>	
	Million t-CO2	Comparison with total emissions in the base year
CO2 emissions of energy origin	1,076 ~ 1,089	1.3 ~ 2.3
Industrial sector	424 ~ 428	-4.6 ~ -4.3
Business and other sector	208 ~ 210	3.4 ~ 3.6
Residential sector	138 ~ 141	0.9 ~ 1.1
Transport sector	240 ~ 243	1.8 ~ 2
Energy conversion sector	66	-0.1
CO2, CH4 and N2O emissions of non-energy origin	132	-1.5
3 types of gases including alternative CFCs	21	-1.6
Greenhouse gas emissions	1,239 ~ 1,252	-1.7 ~ -0.8

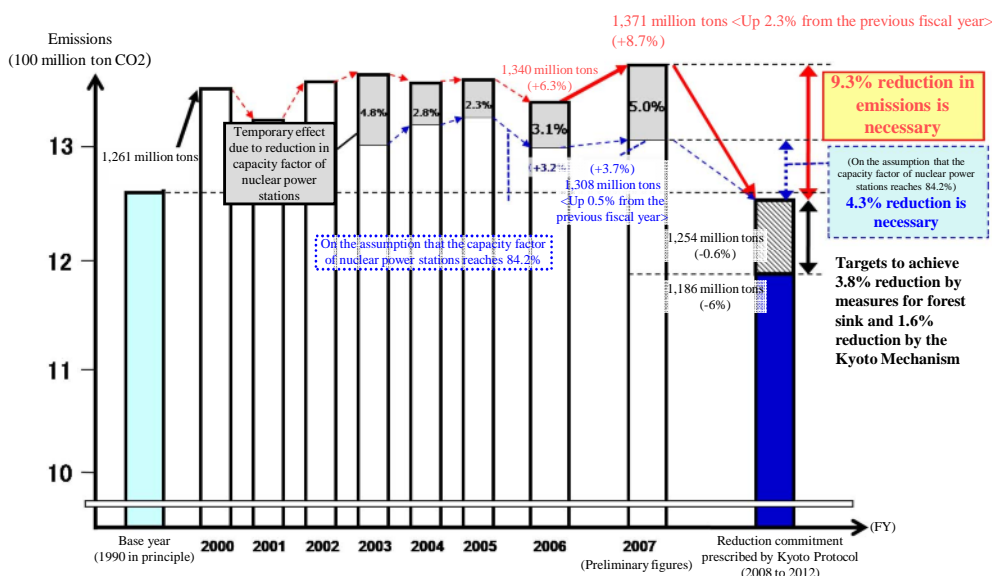
Note: As for indicative emissions, there are two cases assumed. One is the case where measures yield the maximum effect assumed, and the other is the case where measures yield the minimum effect assumed. Of course, Japan aims at the former case. Even in the latter case, however, Japan sets an indicative emissions that can achieve the target prescribed by the Kyoto Protocol.

**Measures for sinks and the Kyoto Mechanism are included in the reduction of greenhouse gas emissions to reliably achieve the 6% reduction commitment prescribed by the Kyoto Protocol.**

Source: Kyoto Protocol Target Achievement Plan (fully revised on March 28, 2008)

Figure: Japan's Greenhouse Gas Emissions

Japan's emissions in FY2007 exceeded the level of the base year by 8.7%. It is necessary to reduce emissions by 9.3% to achieve the 6% reduction commitment prescribed by the Kyoto Protocol. (On the assumption that the capacity factor of nuclear power stations reaches 84.2%, it is required to reduce emissions by 4.3%.)



Source: Greenhouse gas emissions in FY 2007 (preliminary figures), the Ministry of the Environment

## (2) New approaches to energy issues

### [1] Reinforcement of introduction of new energy and other energy sources

- The introduction of new energy, etc. is further reinforced based on the action plan to create low carbon society (July 2008), future development strategy (April 2009) and others.

(Example)

- Share of zero-emission power sources at 50% or higher in 2020
- Increase in photovoltaic power generation by about 20 times as much in about 2020 and 40 times in 2030

Figure: Solar Cell Panels



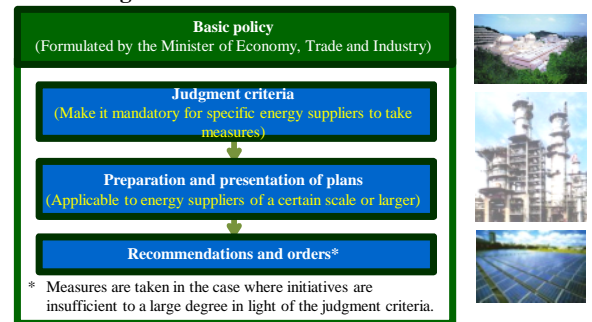
### [2] Legislation for utilization of nonfossil energy sources and effective utilization of fossil energy (Cabinet decision on March 10, 2009) [presented again]

- Utilization of nonfossil energy sources and effective utilization of fossil energy materials by energy suppliers (electricity, petroleum and gas utilities) will be encouraged.

(Example)

- Utilization of nonfossil energy sources such as sunlight, nuclear energy and others
- Purchase of surplus electricity produced by photovoltaic power generation at appropriate prices
- Utilization of biofuel and biogas
- Effective utilization of crude oil and natural gas

Figure: Scheme to Promote Initiatives

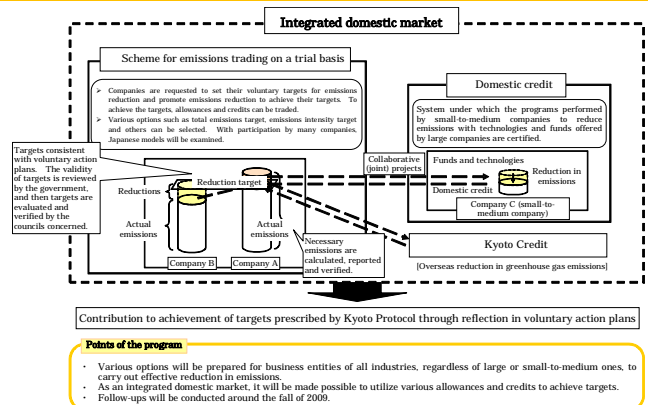


### [3] Drastic revision of the Energy Conservation Act

- The unit subject to regulations will be revised from single business unit to whole business entity, and the scope of the business sector subject to regulations will be significantly expanded.
- The indexes (benchmark indexes) that can compare the status of energy conservation of business entities in breakdown by specific field (sector) will be laid down, and the levels to aim at in the medium-to-long term will be set as targets. With these indexes, those business entities whose energy conservation is largely advanced will be highly valued and those business entities whose energy conservation is fallen back will be encouraged to make further efforts.

### [4] Implementation of integrated domestic market for emissions trading on a trial basis

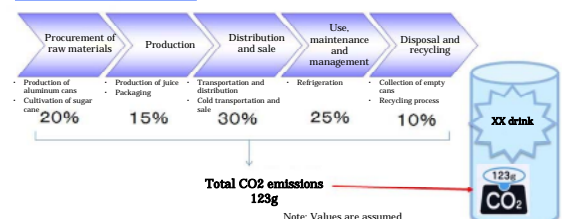
- Implementation of integrated domestic market for emissions trading started in October 2008 on a trial basis (a total of 523 companies applied for participation).
- As for the domestic crediting system that was commenced at the same time, applications for a total of 12 emissions reduction businesses were accepted.
- The results of implementation on a trial basis will be fully evaluated, and the conditions and challenges to be required for full-scale introduction will be clarified. Those systems that are appropriate to Japanese industries whose nucleus is composed of technology and craftsmanship will be seriously examined.



### [5] Carbon footprint

- CO2 emissions of total life cycles of products and services will be “visualized,” and both business entities and consumers are encouraged to produce and buy those products and services of less emissions.
- A “desirable carbon footprint system (guideline)” and the “standard for development of the product category rule (PCR)” were formulated in March 2009, and the project for introduction of market started on a trial basis in FY2009.

➤ Example of canned beverage



### 3. International negotiations for creation of future framework

#### Japan's views on global warming issues

##### [1] Three principles of Cool Earth 50

- Developing countries account for a half of the world's total emissions, and the following "three principles" are important to create an international framework for the period in and after 2013 to stabilize the concentrations of greenhouse gases.
  - All of the major emitting countries will participate in the framework and emissions are reduced in the world at large.
  - The framework will be flexible and diverse with consideration given to the realities of each country.
  - Environmental protection and economic development will be made well compatible with each other by making use of energy-saving technologies and other means.

##### [2] Initiative for Cool Earth Promotion

###### • Post Kyoto framework

- For reduction in greenhouse gas emissions, Japan will declare national targets for total reduction together with other major emitting countries and address the initiative.
- In setting targets, energy efficiency will be calculated in breakdown by sector, possible volume of reductions will be accumulated based on the technologies to be utilized in the future, and the fairness of reduction burdens will be ensured.

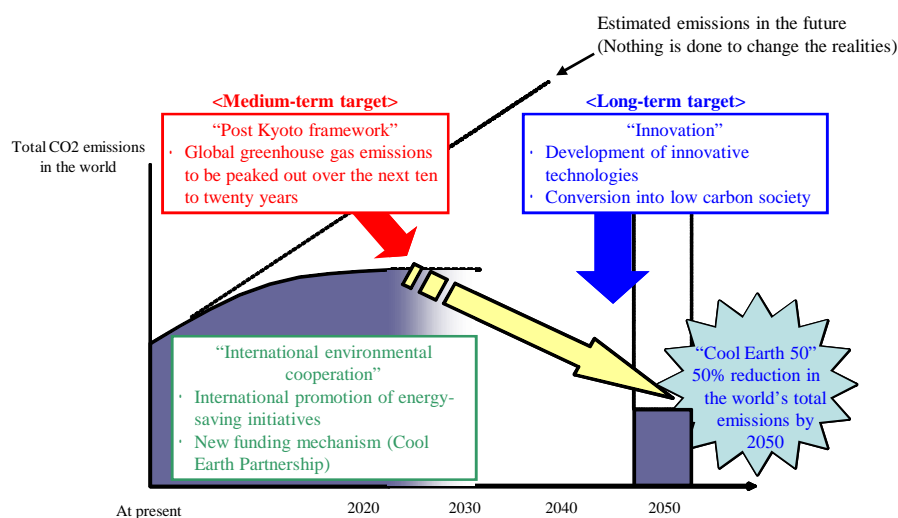
###### • International environmental cooperation

- The target to improve energy efficiency by 30% in the world as a whole by 2020 will be shared in all parts of the world.
- A new funding mechanism of \$10 billion scale (Cool Earth Partnership) will be created to support measures against global warming in developing countries.

###### • Innovation

- Development of innovative technologies and conversion into low carbon society
- Emphasis is placed on investments in research and development in the environmental and energy fields, and about \$30 billion will be invested over the next five years.

Figure: Initiative for Cool Earth Promotion



##### [3] Medium-term and long-term strategies to reduce the world's CO2 emissions

- In the medium term, a fair and effective international framework will be created in which all countries, including the U.S., China and other major emitting countries, participate.
- In the long term, development of innovative technologies will be positively carried on, aiming at 50% reduction in the world's total emissions by 2050.

## Sectoral approach

- A fair and comparable “yardstick” will be prepared to encourage all of the major emitting countries to participate in the approach.
- In the case of advanced countries: national targets for total reduction are set based on the “yardstick”
- In the case of developing countries: reduction actions based on the “yardstick” are carried on.
- Participation of developing countries is encouraged through the diffusion of Japan’s superior environmental and energy-saving technologies

Figure: Outline of Sectoral Approach

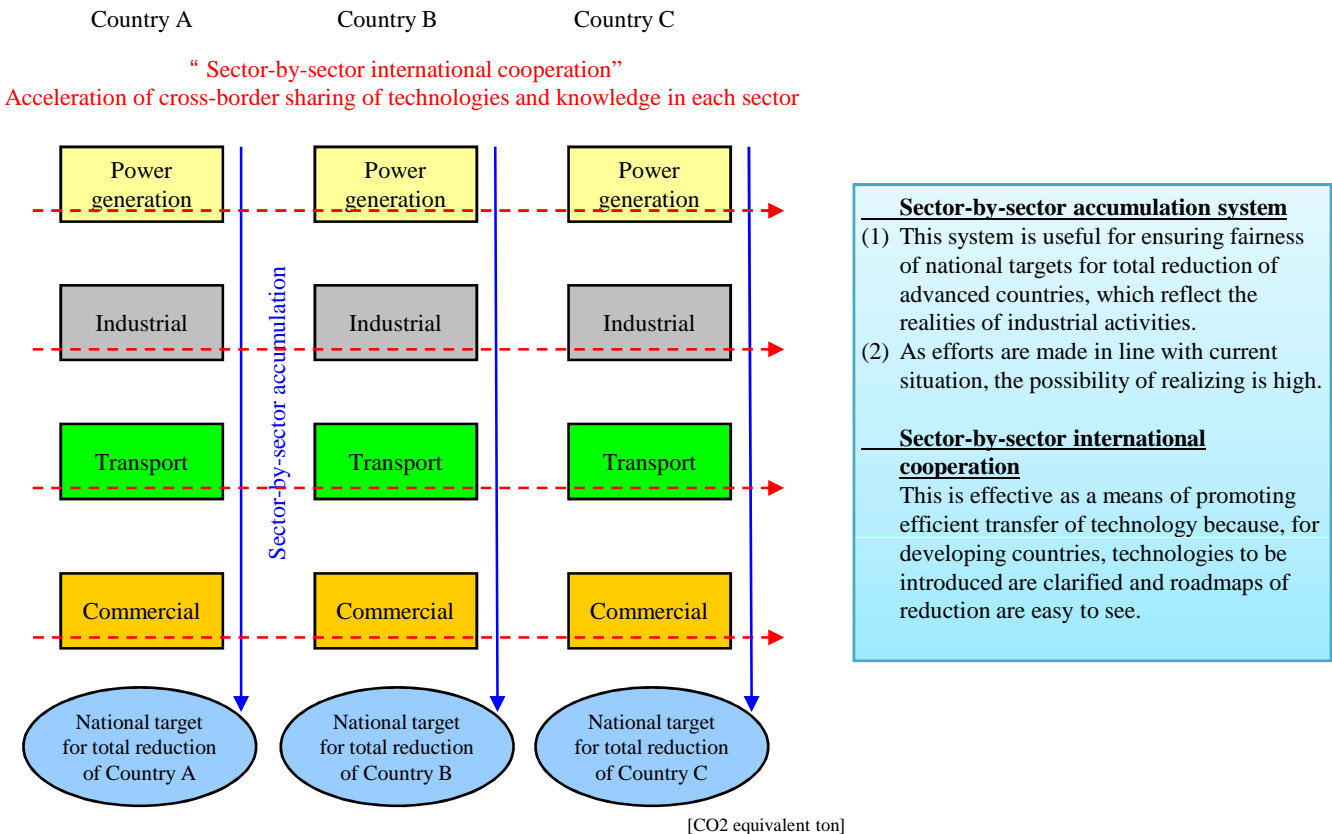
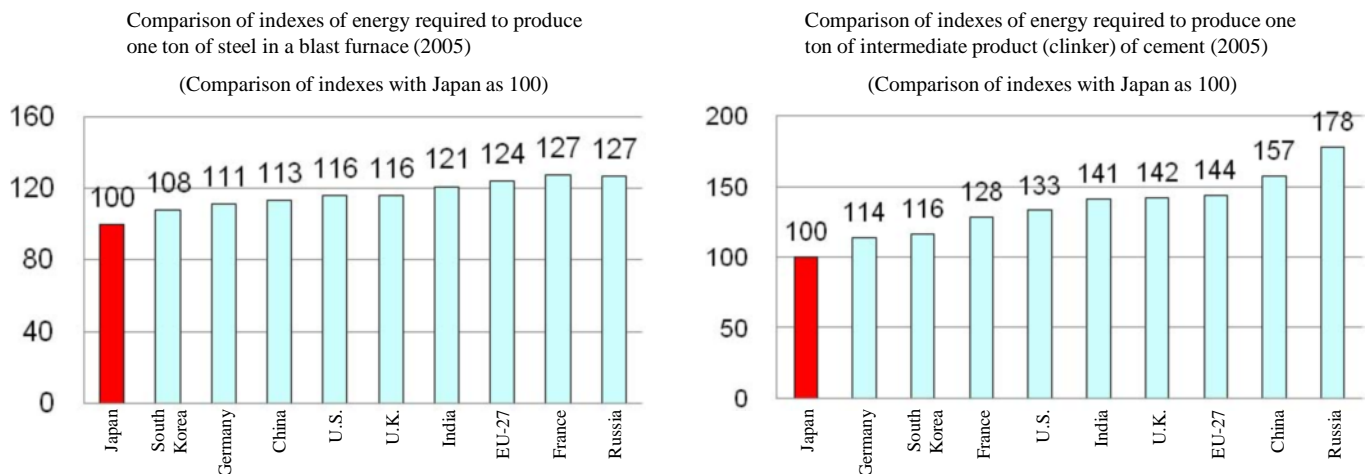


Figure: Realities of Emissions in Each Sector



Source: Model estimation made in 2005 in the case where it is assumed that each country takes every minus-cost measure based on the data in 2000 of Research Institute of Innovative Technology for the Earth (2009)

## Approaches to reduction of the world's total greenhouse gas emissions

### [1] Asia-Pacific Partnership (APP) on Clean Development and Climate

- Activities by the public and private sectors in the Asia-Pacific region. The seven participating countries (Japan, the U.S., Australia, South Korea, China, India and Canada) account for 54% of the world's total emissions (2005).
- The public and private sectors cooperate with each other and formed an international task force for each of the eight sectors, and promote approaches to emissions reduction.

### [2] Approaches by international industrial associations

- Sectoral approaches are promoted by international industrial associations mainly in the following three fields, i.e., iron and steel, cement and aluminum.
- Discussions are now underway concerning the calculation method of emissions, setting of indexes, data collection, setting of targets, etc.

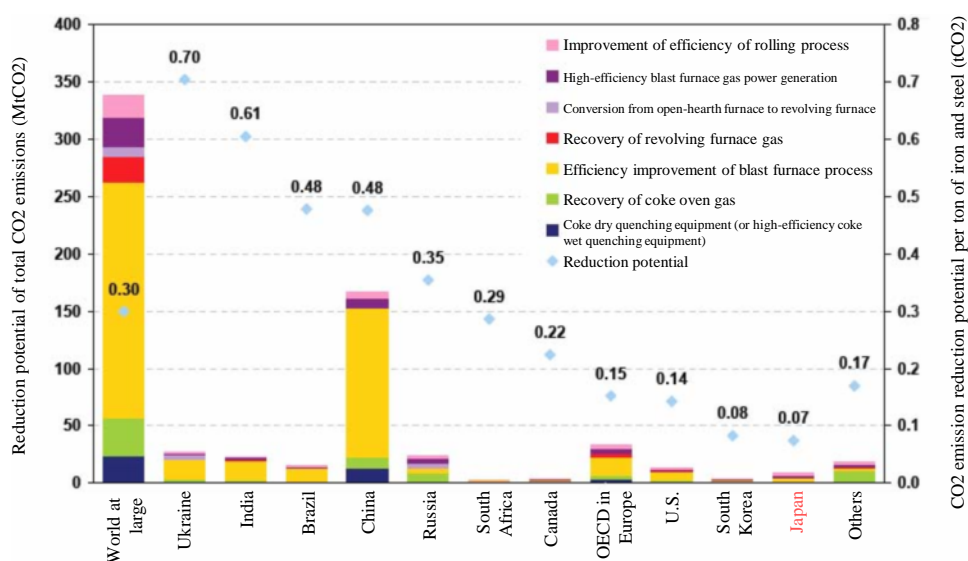
### [3] Deeper understanding about sectoral approach in international scenes

- Japan will carry on specific approaches in an attempt to properly place importance on the sectoral approach in the next framework at arenas of negotiations in the United Nations.
  - The idea of sectoral approach has been internationally shared through such opportunities as the international workshops held in May and October 2008, and the industry ministers meeting on sector-by-sector cooperation in November 2008.
  - Before AWG (Ad-hoc Working Group) held in March 2009, a workshop on sectoral approach was co-hosted by EC and Poland, and the workshop made discussions about the following points:
    - Analyses of national models concerning reduction potential
    - Discussions about international sector-by-sector approaches

### [4] Development of indexes by International Energy Agency (IEA)

- At the G8 Hokkaido Toyako Summit, IEA presented the energy efficiency and CO2 reduction potential of respective countries by major industry.

Figure: Reduction Potential of Iron and Steel Sector by Introduction of Technology (BAT) (Example)



Source: Developed based on IEA "Worldwide Trends in Energy Use and Efficiency."

## Stance of each country

Note: represents domestic and regional measures.  
represents the stance on the creation of international framework.

### [1] U.S.

The U.S. plans to reduce emissions by 14% from the 2005 level by 2020, and by 83% by 2050. Though the former administration opposed the introduction of emissions trading, President Barack Obama supports the introduction of a cap-and-trade type of emissions trading.

For global reduction in emissions, reduction by every country, including major emitting developing countries including China and India, is necessary. In order for the U.S. to participate in the next framework, commitment by these major emitting developing countries, particularly China, is essential.

### [2] EU

With regulations on total volume of emissions, a temperature rise is controlled within 2°C. EU plans to reduce emissions by 20% from the 1990 level by 2020 (or by 30%, if other advanced countries follow suit). A cap-and-trade emissions trading system started within EU in January 2005. Based on a three-year pilot phase, the system is now being implemented for the period from 2008 to 2012.

Advanced countries are required to reduce emissions by 30% from the 1990 level and by 60-80% by 2050. Developing countries, particularly emerging economies, are required to assume obligation in accordance with their responsibility.

### [3] China

Under the “Climate Change National Plan” (June 2007), a target to be achieved by 2020 is set (20% improvement of energy efficiency from the 2005 level). For each of major sectors (iron and steel, non-metal, petrochemistry and others), energy consumption intensity targets are set for the period until 2020.

Importance is placed on the principle of “common but differentiated responsibility.” It is stressed that advanced countries should take the initiative to reduce emissions.

### [4] India

There is no regulation on total volume of emissions. In June 2008, India announced its national action plan for climate change, and declared that its emissions would not exceed the per capita GHG emissions of advanced countries. India plans to promote eight high-priority fields, including photovoltaic power generation, energy conservation and forest protection.

Importance is placed on the principle of “common but differentiated responsibility.” India stresses the responsibility and reduction obligation of advanced countries. Further, India insists that reduction in per capital emissions should be a long-term target.

\* China, India, Brazil, Mexico and South Africa demand that advanced countries as a whole should reduce their emissions by 25-40% from the 1990 level by 2020 and by 80-95% by 2050.

**Table: Outlook for Emissions in Major Countries in 2020 (Medium-term Targets)**

	Base years set by respective countries	Change from the 2005 level (GHG basis)	(Reference) Change from the 1990 level
U.S.	2005	-14%	± 0%
EU	1990	-14% <sup>*1</sup>	-20% <sup>*1</sup>
Canada	2006 (-20% )	-21%	-3%
Australia <sup>*2</sup>	2000 (-5%)	-10%	-5%

\*1 The figure includes credits to be acquired from overseas.

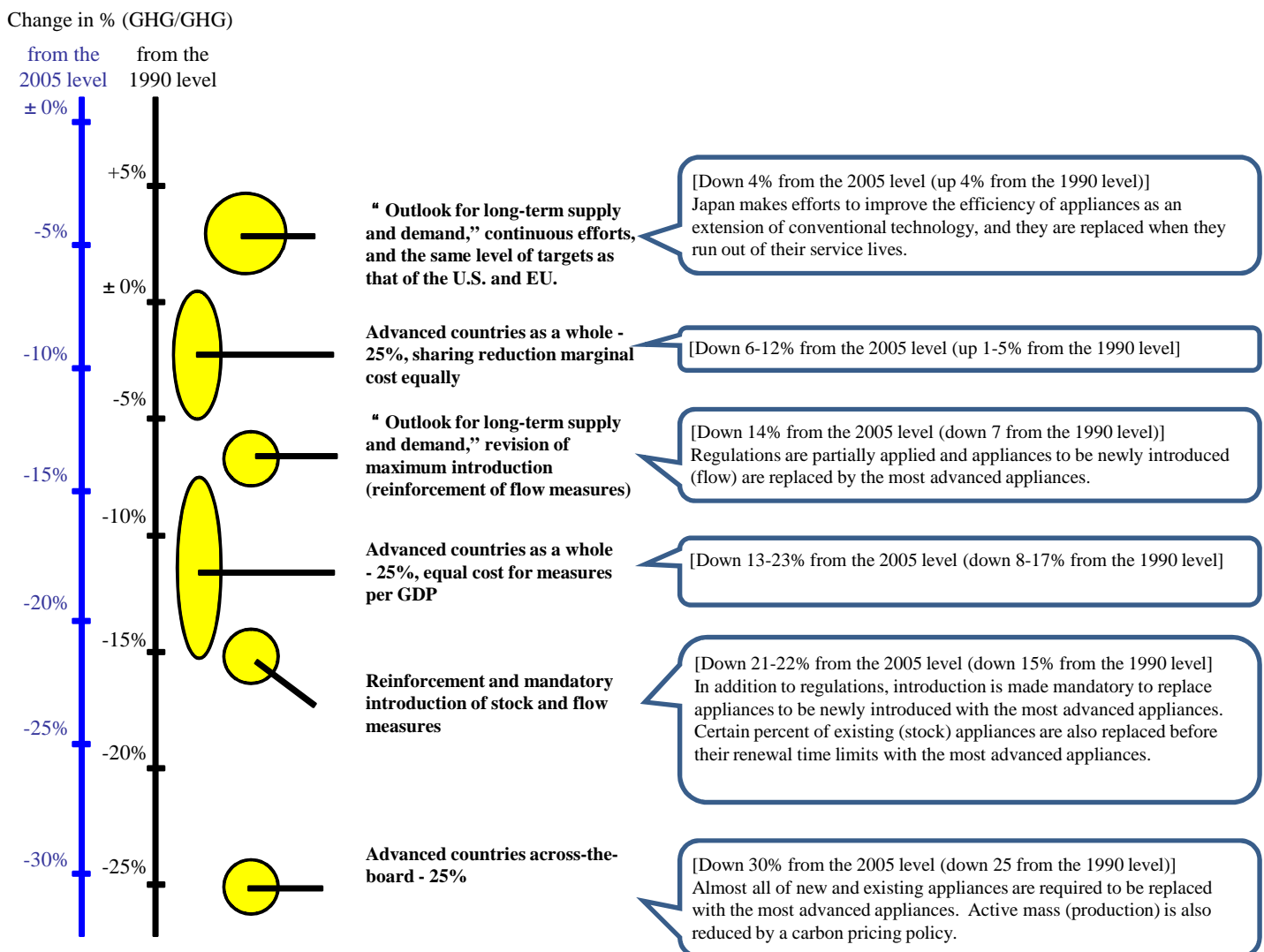
\*2 The figure includes changes in land use.

## Circumstances in Japan

### <Status of review of medium-term targets>

- Targets are reviewed by forming a sub-committee on review of medium-term targets under the committee on global warming issues (October 2008).
- To select multiple candidate options of medium-term targets, the ensuring of fairness and the effects on the life and economy of Japanese people are analyzed by using calculation models.
- Keeping in mind of hearing results of parties concerned and with reference to opinions of the committee on global warming issues about the multiple options presented by the review committee, the government plans to decide and announce Japan's medium-term targets by June at the latest.

Figure: Multiple Options

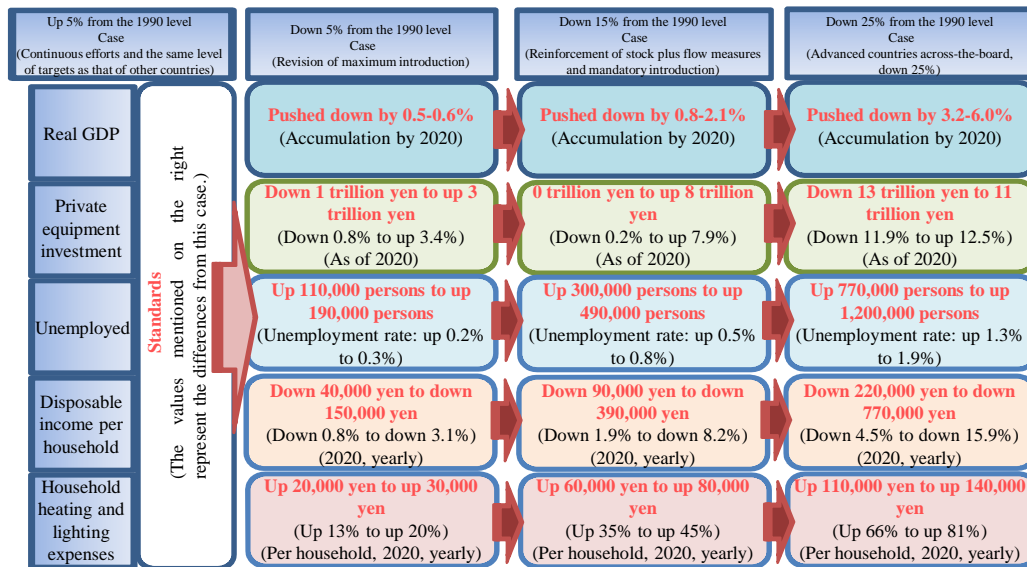


Source: Developed based on "Data of Sub-committee on Review of Medium-term Targets (the seventh meeting) of the Committee on Global Warming Issues," the Prime Minister's Office.

## Status of review of medium-term targets (analyses of effects on economic activities)

- The more the measures against global warming are promoted, the more the investments in energy conservation are stepped up and the more the private investments increase. However, as certain constraining pressures are added to the economy and the cost of society as a whole is increased, with the result that the real GDP falls off and the unemployment rate rises.

Figure: Results of Analyses by the Sub-committee on Review of Medium-terms Targets concerning the Effects on Economic Activities



Source: Developed based on "Data Sub-committee on Review of Medium-term Targets (the sixth meeting) of the Committee on Global Warming Issues," the Prime Minister's Office.

## What Japan aims at in creating an international framework:

### [Shared visions]

- Adopt the long-term target to reduce the world's total greenhouse gas emissions by half by 2050 under direction of UNFCCC

### [Mitigation]

#### (Advanced countries)

- Set total national emissions targets that present the reduction rates from multiple base years and total emissions
- For ensuring of comparability, the sectoral approach is useful as it analyzes reduction potentials and their costs with consideration given to the situation of each sector and examines appropriate measures with reference to the actual conditions.
- Targets should be achieved by domestic measures in principle, and the use of flexibility mechanism (acquisition of credits, etc.) should be defined as supplemental measures.

#### (Developing countries)

- Major developing countries set their efficiency targets for major sectors and overall economy as binding targets.

### [Technology]

- Form sector-by-sector advisory groups with technology experts to support mitigation actions in developing countries, and promote cooperation between the public and private sectors

### [Funds]

- Make use in the most effective manner possible of the funds of UNFCCC and other similar organizations, support by international organizations, ODA, technical assistance by other countries, research and development investments and other investments by way of markets

### [Compliance and requirements for effectuation]

- Take measures to further compliance toward the future in principle and guarantee participation of all major economies