

# *Policies on Environment and Energy in Japan and Efforts of MEXT*

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# International framework for climate change policies

## United Nations Framework Convention on Climate Change (UNFCCC)

Conference of the Parties (COP)  
= 187 countries + EC

An international framework on global warming established with the aim of protecting the current and future climate

Meetings of  
Subsidiary Body for Science  
and Technological Advice

Meetings of  
Subsidiary Body  
for Implementation

Secretariat: Germany (Bonn)

Scientific basis  
for climate change



Request information  
necessary to achieve  
reduction targets



## Intergovernmental Panel on Climate Change (IPCC)



Dr Rajendra K Pachauri, chairman (India)

Aims to review and assess the most recent scientific knowledge on climate change to provide a scientific basis for national government policy-making in climate change.

# *I P C C Assessment Reports*

## *Assessment Reports*

- Scientific literature relating to climate change is reviewed and evaluated, and specialist knowledge is collected. -> Compiled and published every few years.
- With the aim of providing a scientific basis for policy-making at the national level, a Summary for Policymakers is also published at the same time.

- **First Assessment Report (1990)**

*“...the observed increased [warming] **could be** due to ... human-induced greenhouse warming.”*

- **Second Assessment Report (1995)**

*“...The balance of evidence **suggests** a discernible human influence on global climate.”*

- **Third Assessment Report (2001)**

*“...most of the observed warming over the last 50 years is **likely** to have been due to the increase in greenhouse gas concentrations.”*

- **Fourth Assessment Report (2007)**

*“Most of the observed increases in globally averaged temperatures ... is **very likely\*** due to the observed increase in anthropogenic greenhouse gas concentrations.”*

*\*over 90% reliability*

- **Fifth Assessment Report**

Working Group 1 assessment report planned for September 2013, and the full report for September 2014

# *UN Framework Convention on Climate Change (UNFCCC)*

## **Overview of the Convention**

In recognition of threats to the ecology and environment posed by increasing greenhouse gases in the earth's atmosphere that cause warming, the convention was launched at the Earth Summit (UNCED, Rio de Janeiro) in 1992 with the aim of stabilizing the concentration of greenhouse gases in the atmosphere, and entered into force in 1994.

### **Stipulations in the Convention**

#### Commitments borne by convention signatories (countries)

Cataloging of the emission and absorption levels of greenhouse gases; formulation & implementation of warming countermeasure plans by country; and technological development/dissemination, etc.

#### Commitments borne by the developed countries in particular

- The return to greenhouse gas emission levels prior to the turn of the century; financial assistance to developing countries; technological support, etc.

## **Kyoto Protocol**

Adopted at the COP3 in 1997 with the aim of realizing objectives of the UNFCCC. Required the developed countries to reduce greenhouse gas emissions to specified levels (6% for Japan, 7% for the USA, 8% for the EU) in the period 2008~2012, as compared to 1990 levels.

## **Formulating Post-Kyoto Protocol Frameworks**

A decision was reached at the COP15 in 2009 to take note of the Copenhagen Accord, while registering the reduction goals for 2020 by January of 2010, and deliberating on post-2013 frameworks for the period following the conclusion of the Kyoto Protocol at the COP16.

# Overview of 15<sup>th</sup> Conference of the Parties (COP 15) to the UNFCCC

The COP15 (December 7-19, 2009, in Copenhagen) decided to **take note of the Copenhagen Accord**

## Outline of the Copenhagen Accord

### 1. Emissions reduction targets and mitigation actions

#### (1) Mid-term goals

- ✓ Annex I parties (developed countries) 2020 reduction targets and non-annex I parties (developing countries) mitigation actions to be submitted to Appendix 1 and 2 respectively.

All countries to make their submissions to the accord by January 31, 2010.

- ✓ Actions of parties to the accord to be measurable, reportable and verifiable (MRV). The voluntary mitigation actions of non-annex I parties (developing countries) to be verified domestically and then deliberated internationally. Mitigation actions implemented with support are subject to international MRV.

#### (2) Long-term goals

- ✓ Limit a rise in global temperatures to within 2 degrees Celsius above pre-industrial levels

### 2. Funding

#### (1) Short-term funding

- ✓ Developed countries committed to contribute a new and additional total of 30 billion dollars in public funds between 2010 and 2012. (Hatoyama announced that Japan is to contribute 1.5 billion dollars over 3 year (of which 1.1 billion constitutes public financing) to support developing countries)

#### (2) Long-term funding

- ✓ Committed to goal of mobilizing annual new funding of 100 billion dollars by 2020.

# Major Trends in Green Innovation Promotion in Japan

## Becoming a Leading Environmental Nation in the 21st Century (Cabinet approved in June 2007)

- Proposes the long term goal : **“Reducing global emissions to half of current levels by 2050”** as a common global goal.
- Presents the long-term visions of developing innovative technology and creating a low-carbon society.

## Low Carbon Technology Plan (approved by Council for Science and Technology Policy in April 2008)

- Outlines **“36 kinds of innovative science and technology”** essential for halving global GHG emissions by 2050  
(e.g. fast-breeder nuclear reactors, next-generation light-water reactors, solar power generation, super conducting power transmission, hydrogen production, biomass, electric vehicles, earth observation and climate change prediction technology)

## Action plan for Achieving a Low-carbon Society (Cabinet approved in July 2008)

- Sets the goal : **“Reducing Japan’s GHG emissions by 60-80% of current levels by 2050.”**
- Incorporates “development for key innovative technologies”, “diffusion and promotion of existing advanced technology”, and “diffusion of frameworks to support the entire country’s transition to a low-carbon society.”

## Development of technology for a new society adapted to climate change (approved by Council for Science and Technology Policy in January 2010)

- Outlines the strategy for realizing a society adapted to climate change that will make sustainable growth possible.
- Stipulates the technologies and policies necessary for this strategy.

# Japan's reduction targets for greenhouse gas emissions

Statement by Prime Minister Yukio Hatoyama  
at the United Nations Summit on Climate Change

22 September 2009

Based on the discussion in the Intergovernmental Panel on Climate Change (IPCC), I believe that the developed countries need to take the lead in emissions reduction efforts. It is my view that Japan should positively commit itself to setting a long-term reduction target. For its mid-term goal, Japan will aim to reduce its emissions by 25% by 2020, if compared to the 1990 level, consistent with what the science calls for in order to halt global warming.

This is a public pledge that we made in our election manifesto. I am resolved to exercise the political will required to deliver on this promise by mobilizing all available policy tools. These will include the introduction of a domestic emission trading mechanism and a feed-in tariff for renewable energy, as well as the consideration of a global warming tax.

However, Japan's efforts alone cannot halt climate change, even if it sets an ambitious reduction target. It is imperative to establish a fair and effective international framework in which all major economies participate. The commitment of Japan to the world is premised on agreement on ambitious targets by all the major economies.

**Excerpt from strategy for allocation of FY2010 budget resources  
for science and technology  
(Approved by Council for Science and Technology Policy in October 2009)**

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**Principle policy challenge:**

**Promoting green innovation for an environmentally and economically sound society**

- **Leads the world by the development of innovative environmental and energy technology**

Aiming at the goal of reducing GHG emissions by 25% compared to the 1990 level by 2020 as premises for the agreement on the targets by all the major economies.

- **Changes a social system which will strongly support practical use and diffusion of R&D results**

**1. Promote international use of existing energy efficient technology.**

**2. Accelerate the development of solar battery, fuel cell, biomass, and CCS technology**

**3. Develop breakthrough technology through discovery and integration of new knowledge on S&T**



## Excerpt from New Growth Strategy (basic policy) (Cabinet approved in December 2009)

### *Growth Driven by Japan's Strengths*

#### **(1) Strategy for becoming an environment and energy power through “green innovation”**

##### **[Targets to reach by 2020]**

- Create over ¥50 trillion in new environment-related markets and 1.4 million new environment sector jobs.
- Reduce worldwide GHG emissions by at least 1.3 billion tons of CO<sub>2</sub> equivalent (equivalent to the total emissions of Japan) using Japanese private-sector technology.

##### **[Principal measures]**

- Spread renewable energy by expanding electric power feed-in tariffs, etc.
- Turn homes, offices, etc. into zero-emission structures through the spread of eco-housing, heat pumps, etc.
- Speed development of innovative technologies including storage batteries, next-generation automobiles, and improved thermal power plant efficiency.
- Implement intensive investment project for realizing a low-carbon society via a comprehensive policy package including regulatory reforms and the greening of the tax system.

## Excerpt from New Growth Strategy (basic policy) (Cabinet approved in December 2009) -continued-

### *Platforms to Support Growth*

#### **(5) Science-and-technology-oriented nation strategy**

##### **[Targets to reach by 2020]**

- Lead the world in “green innovation” and “life innovation.”
- Increase the number of universities and research institutions that lead the world in respective fields
- Ensure full employment for all those who have completed doctoral courses in science and technology.
- Encourage utilization of intellectual property possessed by small and medium-sized enterprises
- Improve the convenience of daily life and lower production costs through the use of information and communications technology
- Increase public- and private-sector investment in research and development to over 4% of GDP

##### **[Principal measures]**

- Speed up reforms to universities and public research institutions and provide diverse career paths for young researchers.
- Reform systems and rules to foster innovation.
- Provide “one-stop” government services; reform regulations to encourage the utilization of information and communications technology.

# Overview of the Basic Law (Bill) for Countermeasures Against Global Warming

## The Need for Legislation

- In an effort to counter climate change, PM Hatoyama announced the full mobilization of all policies geared toward achieving the plan for a 25% reduction in CO2 emissions by 2020, based on the establishment of a fair and effective framework along with an agreement on an ambitious goal among major nations.
- There is a need to systematically clarify all policies mobilized for this reduction goal.
- In international negotiations for re-formulating the post-Kyoto Protocol framework, it is important for Japan's fundamental direction on global warming countermeasures to be manifested through legislation.

## Outline of the Bill

### Objective

- To contribute to the assurance of a healthy, cultured life for current and future citizens and the preservation of the natural environment through the promotion of global warming countermeasures, while ensuring stable employment, economic growth, and the stable supply of energy.

### Fundamental Principles

- Stipulate the following principles as countermeasures to global warming
  - Aim for the formation of a low-carbon society by establishing new lifestyles
  - Active promotion under international coordination
  - Work for the dissemination of R&D and its corresponding outcomes
  - Securing a stable supply of energy, etc.

### Medium- to Long-Term Goal

- Full mobilization of all policies geared toward achieving the plan for a 25% reduction in greenhouse gases by 2020, based on the establishment of a fair and effective framework along with an agreement on an ambitious goal among major nations.
- Goal for supplying renewable forms of energy: Introduce 10% supply of primary energy by 2020

### Fundamental Measures

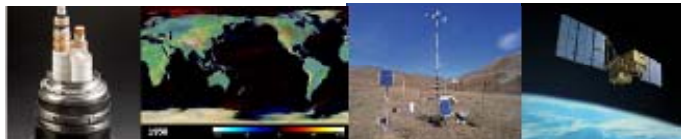
- Formulate plans for the comprehensive, systematic promotion of global warming countermeasures

# MEXT Action Plan for Achieving a Low-Carbon Society

## 1. Promote R&D

○Promotion of R&D based on MEXT's R&D Strategy for Realizing a Low-Carbon Society

- Strategic social scenario research
- Evaluate effects of environmental technologies in the context of their social systems
- Development of technology capable of reducing greenhouse gases, particularly CO<sub>2</sub>
- Research on effects & responses to environmental changes caused by climate change....etc.



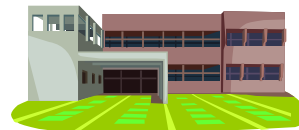
## 2. Promote structures for the study of low-carbon, sustainable societies

- Promotion of environmental education in accordance with revised Courses of Study
- Green Plan for the promotion of environmental education
- Promotion of ESD....etc.



## 3. Promotion of environmentally-considerate school facilities (eco-schools)

- The promotion of eco-friendly renovations such as the adoption solar power generation based on the "School New Deal" concept
- Coordinate/collaborate with related ministries/agencies in formulating medium- to long-term promotion measures for realizing "eco-schools"



## 4. Greening MEXT

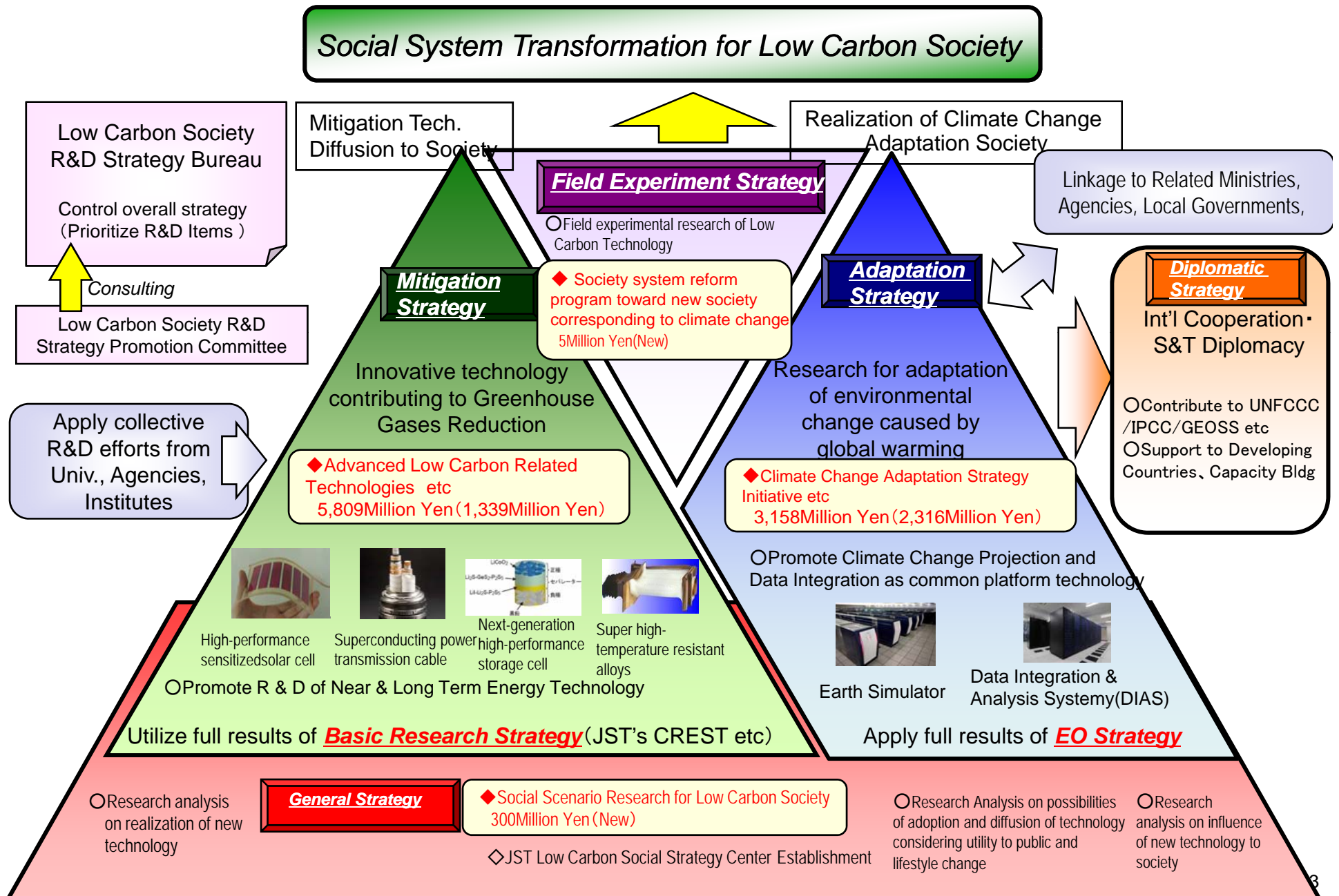
- Energy conservation measures for implementation at the Education Ministry (MEXT)



# R&D Strategy for Achieving a Low-carbon Society - MEXT

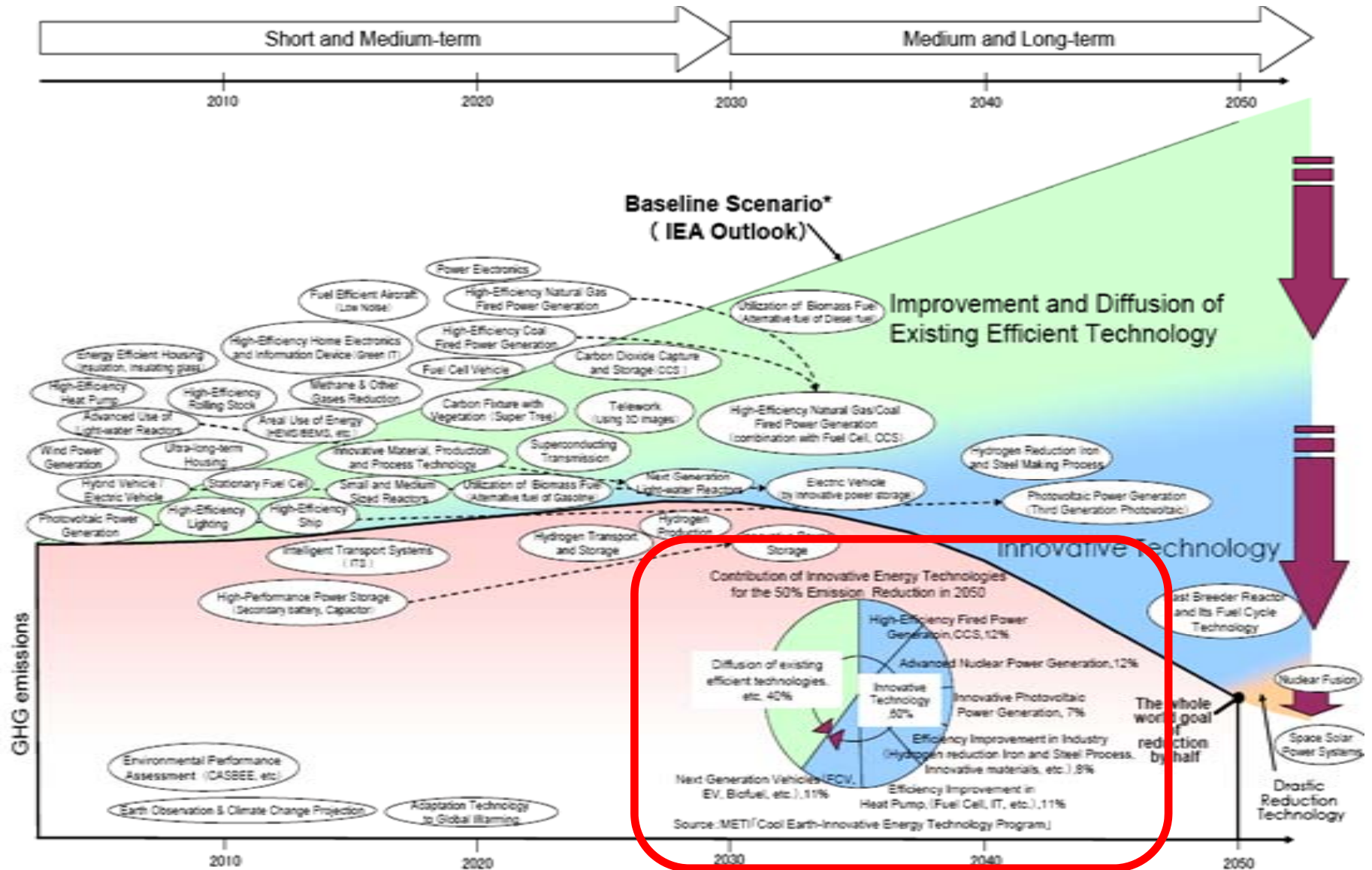


# Strategic Scheme for Green Innovation by MEXT





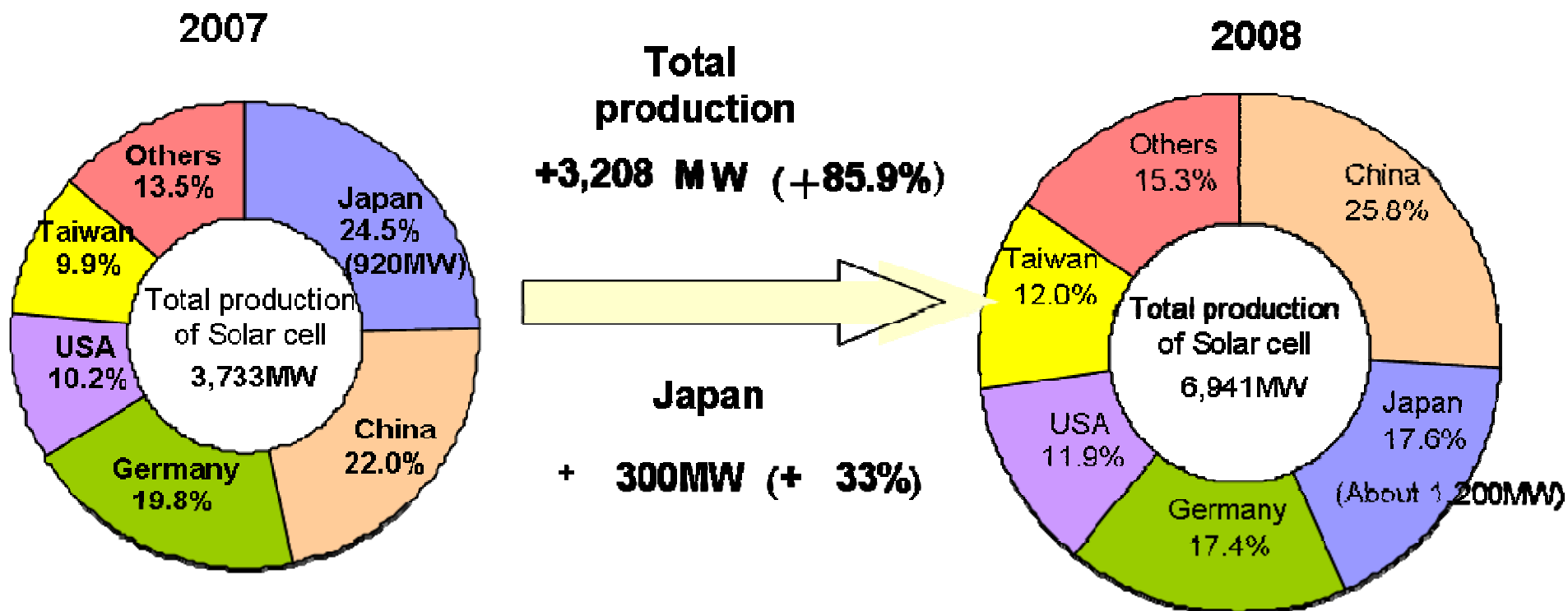
# Development and Diffusion of Environment & Energy Technology as of 2008



(Note) This is a figure indicating images of GHG emissions reduction in the whole world.

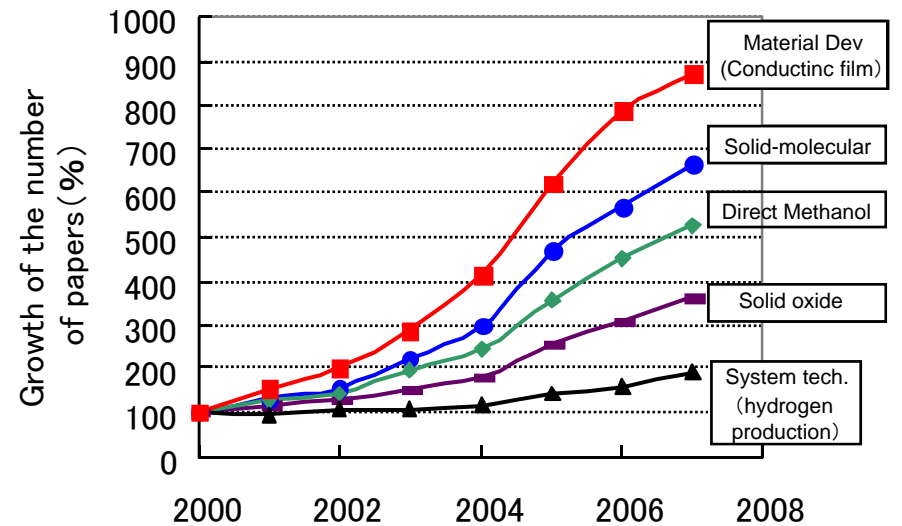
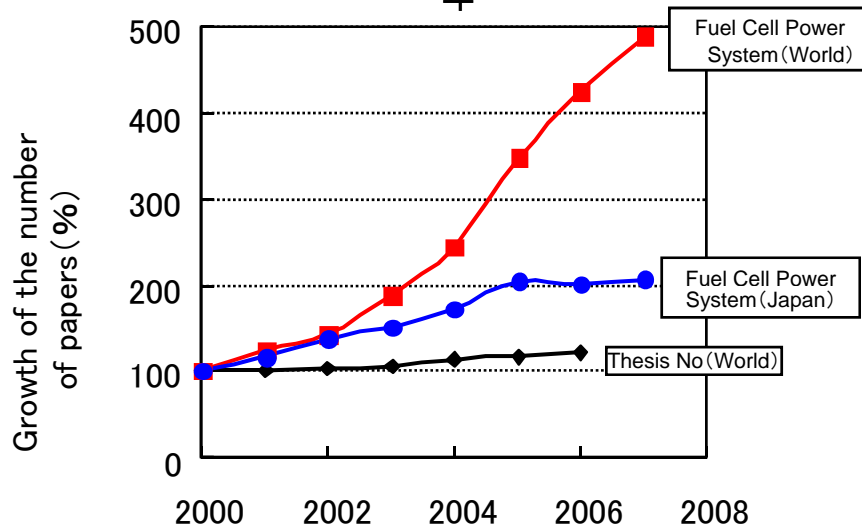
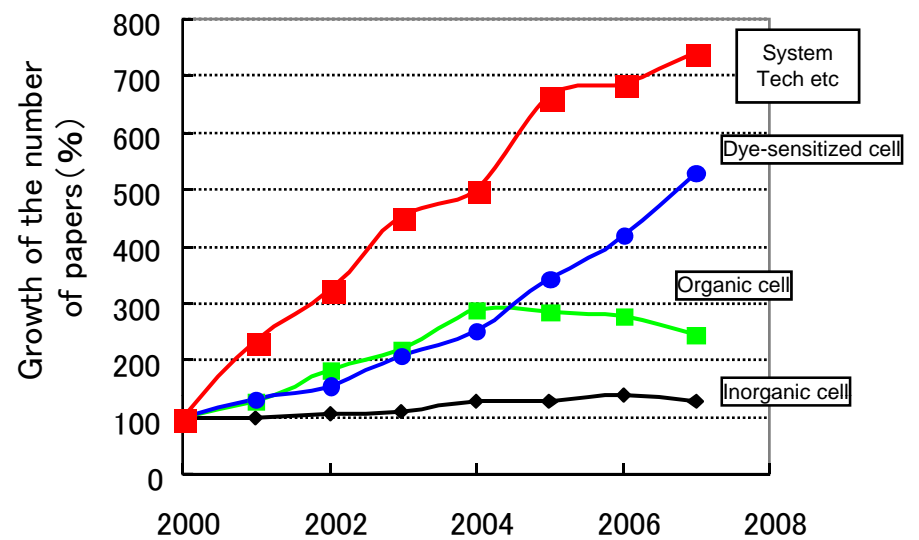
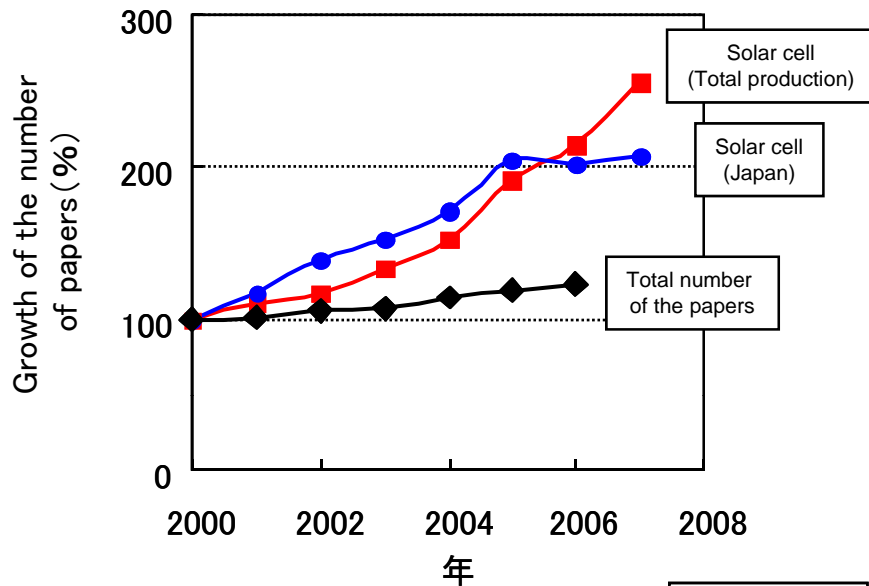
\* Baseline includes the effects of technology developments and improvements in energy efficiency that can be expected on the basis of government policies already enacted.

# Solar cell production by country (2007,2008)





# Increase in numbers of scientific papers on solar cell and fuel cell power generation systems in Japan and internationally



# Advanced Low-Carbon Technology Development

— Promoting R&D of Promising Technologies for CO<sub>2</sub> Reduction Through New Scientific/Technical Knowledge —

## ● DPJ Campaign Pledge

- Aim for CO<sub>2</sub> reduction of 25% and 60%+ by 2020 and 2050, respectively (compared to 1990 levels)
- Advance R&D and practical realization of world-leading environmental technologies such as fuel cells/batteries, superconductivity, and biomass
- Cultivate new industries through innovations, by utilizing new forms of energy and energy-saving technologies

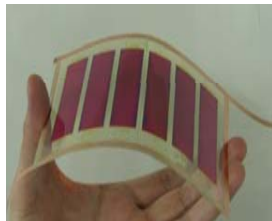
## ● Low Carbon Technology Plan (May 2008 decision by Council for Science and Technology Policy)

Current technologies are inadequate for achieving the drastic future reduction of greenhouse gases. The development of innovative technologies that enable drastic reductions and their corresponding dissemination across society are imperative. In other words, the short- to medium-term requires technological improvement and dissemination, and the medium- to long-term requires a technological revolution.

## 【Methods for Promoting Research】

- Select a technological project that shows promise in CO<sub>2</sub> reduction, and solicit R&D proposals that aim for breakthroughs through the discovery and integration of new technological/scientific knowledge. Promote R&D by the research institution selected by providing assistance of up to 400 million yen per year for 10 years.
- Following the launch of research, implement efforts for their activation throughout society by corporations (entity that will realize and commercialize said technology) and municipalities/corporations (entities that will utilize and disseminate said technology).
- To facilitate the prevention of warming on a global level, said technology should be deliberated and implemented with international expansion in mind.

## 【Some examples】



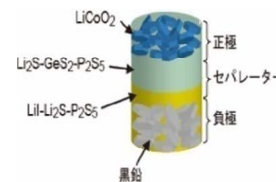
Next-generation dye-sensitized Solar cell



Super high-temperature Resistant alloys

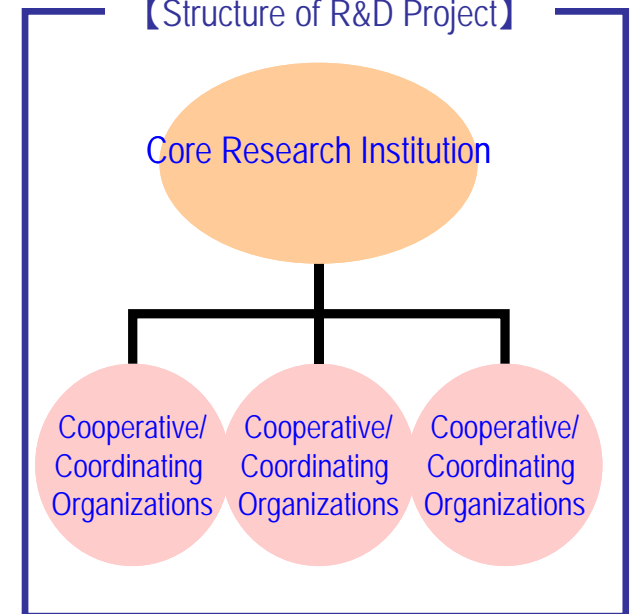


Nearly 0% loss superconducting Power transmission cable



Next-generation high-performance Solar cell

## 【Structure of R&D Project】



※ Can be flexibly formed/modified depending on research concept/scheme

# R&D on Medium- to Long-Term Energy ~ FBR, Nuclear Fusion ~

## Strategic Promotion of Technologies Critical to the Nation

### Fast-Breeder Reactor (FBR) Cycle Technology

#### Core Technological Development for Japan's Energy Strategy

- Enable the efficient utilization of uranium resources dramatically by manufacturing more fuel than the amount consumed
- Re-launch of Monju FBR in FY2010
- Aim for the adoption of a commercial reactor before 2050

Monju High Speed FBR



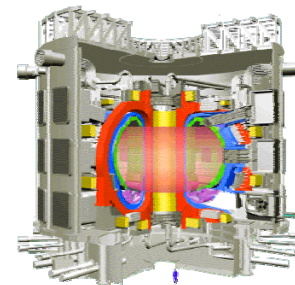
## Promotion of R&D for Progressive Energy

### Promotion of Nuclear Fusion R&D

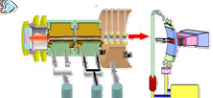
#### Leading-Edge R&D for Realizing the Energy of Tomorrow

Utilize and promote internationally collaborative R&D such as the ITER Plan and diverse approach activities for the realization of fusion energy, which is abundant, environmentally friendly, inherently safe, and has the potential to categorically resolve global energy and environmental issues

### Nuclear fusion R&D



International fusion energy research center



Design of fusion materials irradiation facility  
Satellite Tokamak

Using a wide range of approaches

# GEOSS: Global Earth Observation System of Systems

## Developments

### World Summit on Sustainable Development (September 2002)

Underlines importance of earth observation in balancing environmental protection and economic development

### G8 Evian Summit (June 2003)

Agreed to draw up 10-year implementation plan and hold ministerial meetings

### Earth Observation Summit

1<sup>st</sup> meeting: July 2003, US (Tokai, Senior Vice Minister for Education, Culture, Sports, Science and Technology)  
 2<sup>nd</sup> meeting: April 2004, Japan (Prime Minister Koizumi)  
 3<sup>rd</sup> meeting: February 2005, Belgium (Kojima, Senior Vice Minister for Education, Culture, Sports, Science and Technology)  
 -> 10-year GEOSS Implementation Plan

### G8 Gleneagles Summit (July 2005)

Welcomed the adoption of 10-year GEOSS Implementation Plan

### G8 Heiligendamm Summit (June 2007)

Confirmed will exercise leadership in the development of GEOSS

### Earth Observation Summit

4<sup>th</sup> meeting: November 2007, South Africa (Tokai, Minister for Education, Culture, Sports, Science and Technology)  
 Adopted Cape Town declaration to strengthen international cooperation in satellite, ground and ocean observation systems

### G8 Hokkaido Toyako Summit (July 2008)

Announced intention to strengthen GEOSS systems for observation, prediction and data sharing, in order to address growing demand for earth observation data.

### G8 L'aquila Summit (July 2009)

Announced intention to support ongoing projects for development of GEOSS, in order to deal with the increase in natural disasters and extreme weather events resulting from climate change

### Earth Observation Summit

5<sup>th</sup> meeting planned for November 5, 2010, in Beijing, China

## Outline of GEOSS 10-year Implementation Plan

Through int'l cooperation, integrate satellite, ground and ocean earth observation and information systems to put in place a comprehensive and sustainable global earth observation system of systems within 10 years

- Aim to produce information necessary for policy-making in fields that will benefit society: disasters, health, energy, climate, water, weather, ecosystems, agriculture, biodiversity
- Establish intergovernmental meetings on earth observation (**Group on Earth Observations: GEO**), an **int'l framework for the promotion of GEOSS**

## Group on Earth Observations (GEO)



### GEO ministerial meetings (Earth Observation Summit)

once every few years

GEO Plenary (80 countries + EC, 58 participating organizations), as of February 2010

4 Co-chairs from 2 developed and 2 developing countries  
(US, EC, South Africa, China)

### Executive Committee (13 countries)

(China, Korea, Australia, Japan) (EC, France, Italy)  
(Russia) (South Africa, Cameroon) (US, Brazil, Chile)

### Committees

- Architecture and Data Committee
- Capacity Building Committee
- Science and Technology Committee
- User Interface Committee

### GEO Secretariat

In World Meteorological Organization building, Geneva  
(mainly funded by contributions from GEO member countries)

# Earth Observation Satellite Missions

## Advanced Land Observing Satellite-2 (ALOS-2)

Launch: 2013(FY)  
Missions: Global Land monitoring (Radar)

## Advanced Land Observing Satellite (ALOS)

Launch: 2006.1  
Missions: Global Land monitoring (Optical sensor and rada.)

## Greenhouse gases Observing SATellite(GOSAT)

Launch: 2009.1.23  
Mission: Greenhouse Gases Monitoring (CO<sub>2</sub>、CH<sub>4</sub>)

## Global Precipitation Measurement(GPM)/Dual-frequency Precipitation Radar (DPR)

Launch: 2013(FY)  
Mission: Global Precipitation Monitoring  
(Japan develop DPR on board GPM)

## Global Change Observation Mission (GCOM)

<GCOM-W>  
Launch: 2011(FY)  
Mission: Global Sea Surface Temperature, Precipitation, Sea Ice etc

<GCOM-C>  
Launch: 2014(FY)  
Mission: Global Cloud, Moisture, Vegetation etc

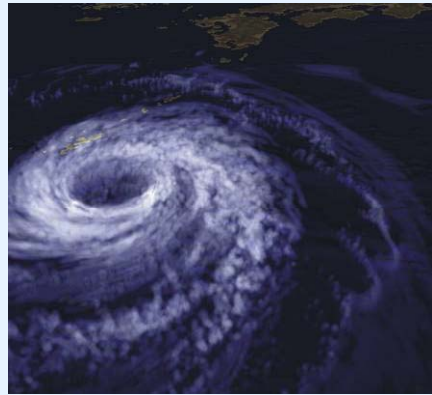


## EarthCARE/ Cloud Profiling Radar (CPR)

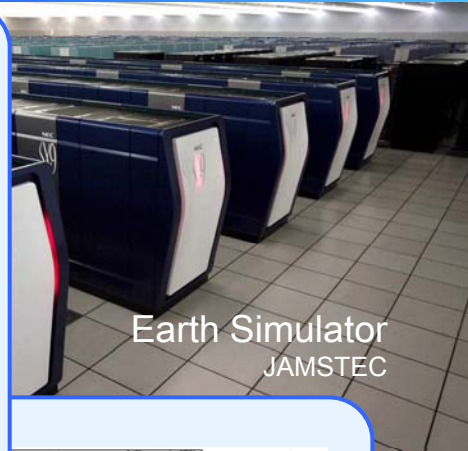
Launch: 2013(FY)  
Mission: cloud and aerosol particles observation  
(Japan develop CPR on board ESA's EarthCARE mission.)



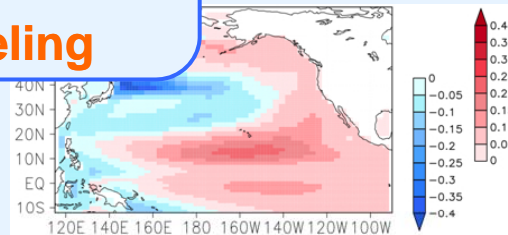
# Innovative Program of Climate Change Projection for the 21st century (KAKUSHIN Program)



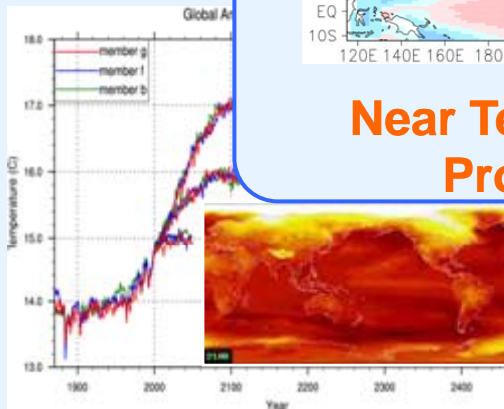
**Cloud Modeling**



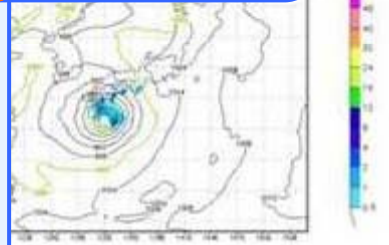
Earth Simulator  
JAMSTEC



**Near Term Climate  
Projection**



**Long Term Global  
Change Projection**



**Extreme Event  
Projection**

## Participating groups and their studies

- ◆ **Long-term global environmental projection**
  - Japan Agency for Marine-Earth Science and Technology (**JAMSTEC**) et al.
- ◆ **Near-term climate prediction**
  - Atmosphere and Ocean Research Institute of the University of Tokyo et al.
- ◆ **Extreme Event Projection**
  - Meteorological Research Institute (MRI) et al.
- ◆ **Cloud Modeling**
  - Hydrospheric Atmospheric Research Center, Nagoya University
- ◆ **Subgrid-Scale Parameterization**
  - Department of Earth and Planetary Science, the University of Tokyo

## Program plan

- ◆ **A 5-year initiative (FY 2007-2011)** by the **MEXT** (Ministry of Education, Culture, Sports, Science and Technology) launched in April 2007
- ◆ The Program is to follow-up and develop the **“Kyo-sei” Project (FY 2002-2006)**
- ◆ The **Earth Simulator** (to be updated) be further utilized.
- ◆ The Program intends to **contribute to the possible AR5.**
- ◆ **Coordination** with studies outside the Program in **impact, adaptation and response strategies** to be closely kept.

# Development of Technology for New Society Adapted to Climate Change

## Developing Infrastructure

### Safe aquatic environment

- water cycle monitoring
- water resources management
- disaster prevention



### Rich green environment

- Forest monitoring technology
- vulnerability assessments
- ecosystem conservation



### Sustainable natural energy systems

- introduction of natural energy
- "smart grids"



## Creating Eco-cities

### Compact cities

- local climate change prediction technology
- insulated buildings



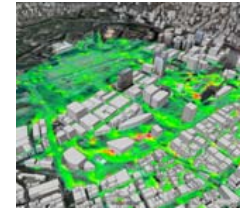
### IT disaster prevention

- prediction and reaction systems
- extreme phenomena monitoring



### Promote health and longevity

- infectious diseases countermeasures
- heat waves/heat stroke countermeasures



## Monitoring, Processing, and prediction

### Climate change monitoring/prediction

- satellite/marine observation
- sophisticated climate change prediction model



### Data processing/integration

- basic platform to integrate and analyze observation and prediction data



# Data Integration and Analysis System (DIAS)

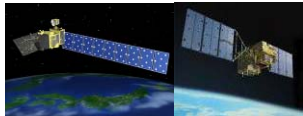


## GOALS

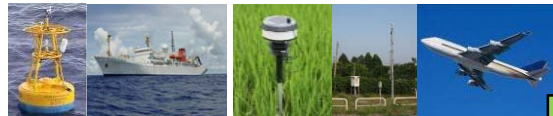
- To create knowledge to be shared among different disciplines
- To create knowledge to be shared throughout the world
- To disseminate data and information that brings awareness

**The mission of DIAS is to produce the scientifically and socially valuable information by integrating and analyzing earth observation data, numerical model outputs and socio-economic data effectively.**

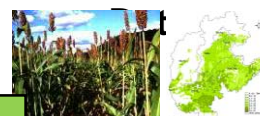
### Satellite Observation



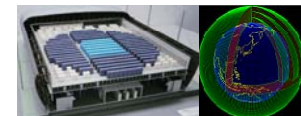
### In-situ Observation



### Socio-Economical



### Weather and Climate Model



## A Prototype of Data Integration and Analysis

### Application Layer

User Apps.

User Apps.

User Apps.

### Common Software Layer

•Visualizer

•Data Transformer

•Data Quality Manager etc.

### Data Management and File System Layer

### Storage Layer

Disk Array





# Special coordination funds for Green Innovation Social System Reformation Program

## Background:

- “FY2010 Guideline for Allocation of Budget and other Resources on S&T” prioritizes a set of policies for acceleration of R&D and new technology creation for mitigation and adaptation related to global warming as one of the most important policy agenda, and decides to funding them in priority. The policies promotes social system reformation to make use of those R&D results, and through these processes, “**Green Innovation**” will be realized, whose objectives are to streamline industrial and social activities and to improve the public living standards. The effort is expected to establish “**Low Carbon Society,**” which sustains both environmental protection and economic prosperity not only in Japan but all of the world.”
- “FY2010 Budget Request Guideline for Special Coordination Funds for Promoting S&T” decides “the programs are implemented to create innovation through **collaboration and coordination between “R&D” and “Social System Reformation**”, and prioritize its funding on establishment of “**Low Carbon Society**” through “**Green Innovation**” by utilization of technologies for mitigation of global warming and adaptation to climate change”  
(Decisions were made by CSTP (Oct., 2009))

## Summary

Technologies are developed to **mitigate global warming**, and at the same time, to **adapt to its inevitable influences**. Those developed technologies are **demonstrated in the social systems**. In addition, **social system reformations** are promoted in pioneering social areas (cities and villages) to respond to coming climate change.

## Requirement

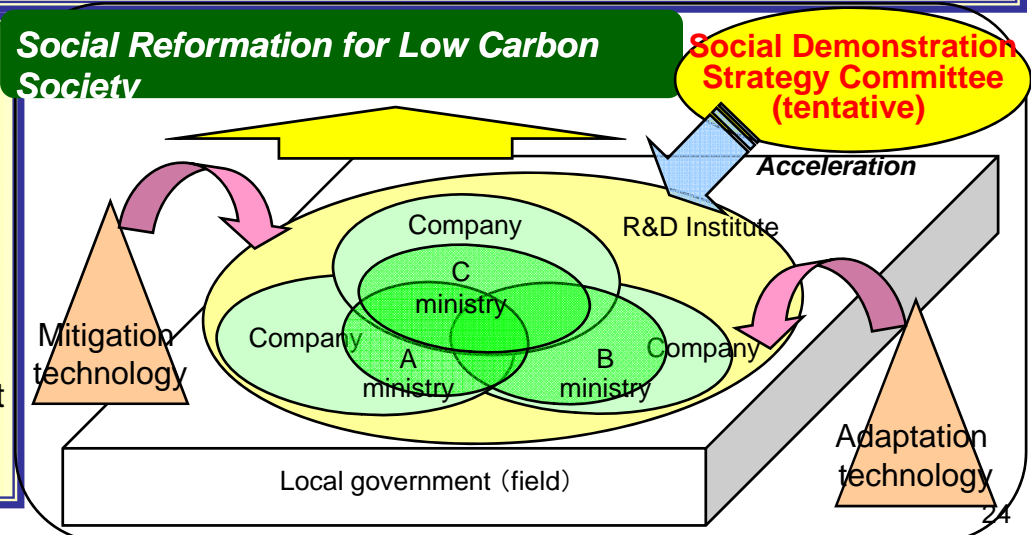
- Cross-ministerial; both technology development responding to climate change and social reformation at the same time

## Financial Support

- 100-200 million yen/ project/ year (upper:200million)
- For a period of 5 years (in principle)

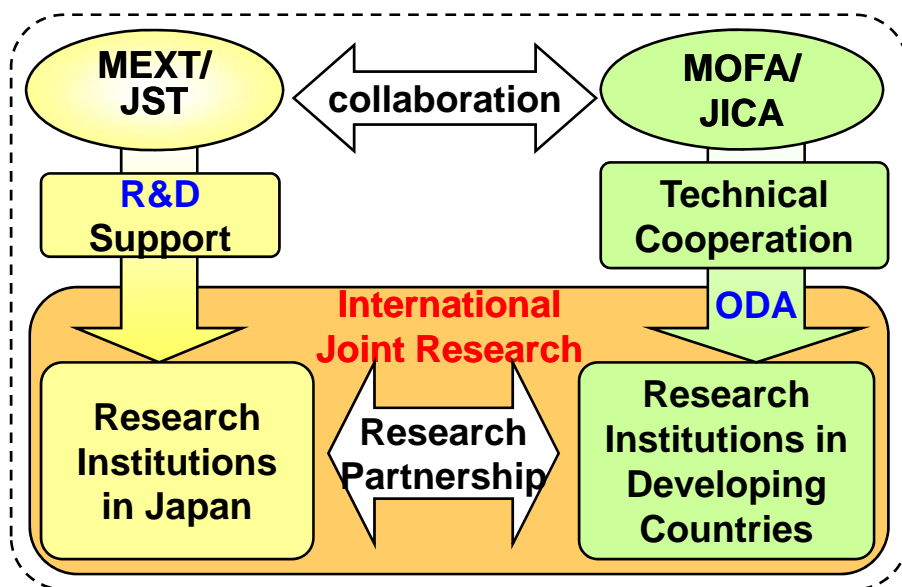
## Promoters (Participants)

- Technology Development and Social Reformation Promotion Team composed of universities, independent administrative agencies, local governments, private companies, or others



# Science and Technology Research Partnership for Sustainable Development (SATREPS)

- JST supports international joint research cooperation between Japan and developing countries for resolving global issues such as: environment/energy, natural disaster prevention and infectious diseases control.
- Such research cooperation is conducted in collaboration with JICA, an organization that implements ODA technical cooperation.
- Objectives of the program are to strengthen the international science and technology (S&T) cooperation between Japan and developing countries, to advance scientific knowledge and technology for resolving the global issues we face, and to build capacities of counterpart researchers and research institutes.

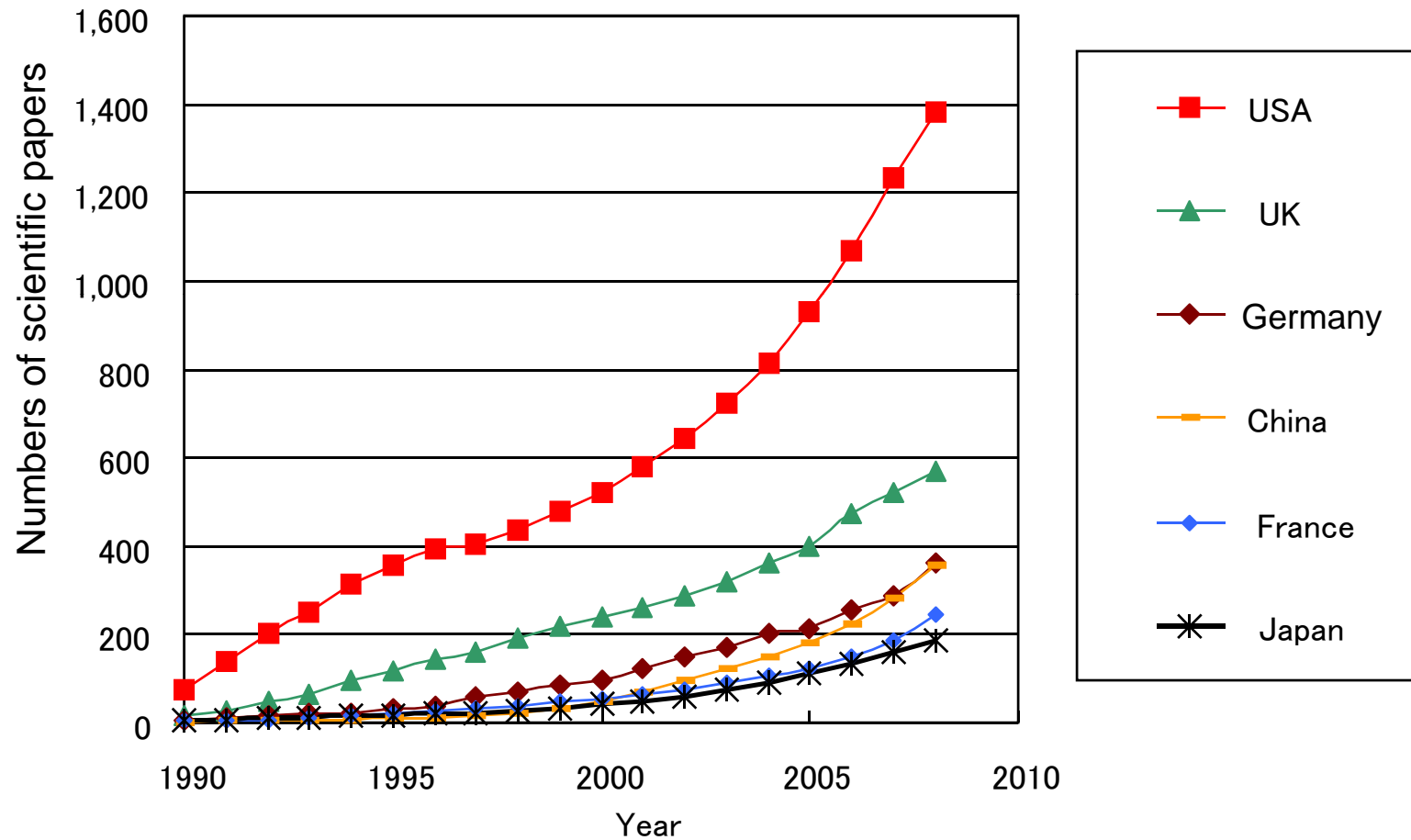


MEXT: Ministry of Education, Culture, Sports, Science and Technology  
 MOFA: Ministry of Foreign Affairs  
 JST: Japan Science and Technology Agency  
 JICA: Japan International Cooperation Agency

## <Joint Research Projects>

Research Areas	Region			FY		
	Asia	Africa	Others	2008	2009	2010
Research contributing to <u>adaptation to or mitigation of climate change</u>	25	13	11	4	4	0
Research contributing to <u>energy systems for low carbon society</u>				—	—	4
Research contributing to <u>the resolution of global-scale environmental issues</u>				3	2	4
Research contributing to <u>sustainable utilization of bio-resources</u>				—	6	5
Research on <u>natural disaster prevention measures</u> attuned to the needs of developing countries				3	4	2
Research on <u>measures to address infectious diseases control</u> attuned to the needs of developing countries				2	4	2
<b>Total</b>				<b>12</b>	<b>20</b>	<b>17</b>
				<b>49</b>		

## *Trends in numbers of scientific papers on sustainability*



# Center for Low Carbon Society Strategy (LCS)

Established in December 2009  
in Japan Science and Technology Agency (JST)

Director-General:  
Hiroshi Komiyama  
the Former President of  
University of Tokyo

***Reduce CO2 emission by efforts in "Daily Life" !***

