



Ministry of the Environment
Government of Japan

**23rd Asia Pacific Seminar on
Climate Change**

Climate Change Mitigation Policies in Japan

25 August 2014

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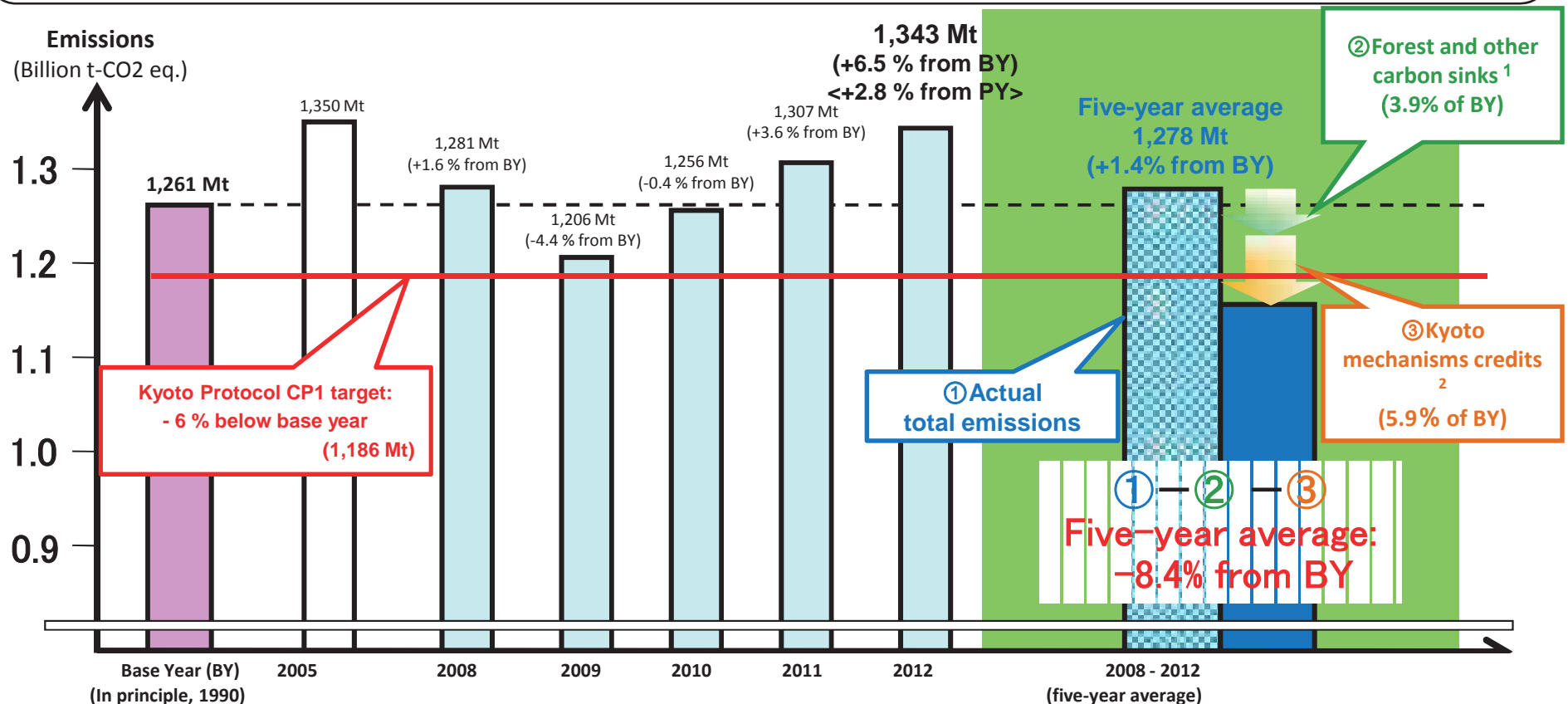
Ministry of the Environment, Japan

GHG Emissions in Japan

Greenhouse Gas Emissions and Achievement for Emission Targets under the Kyoto Protocol

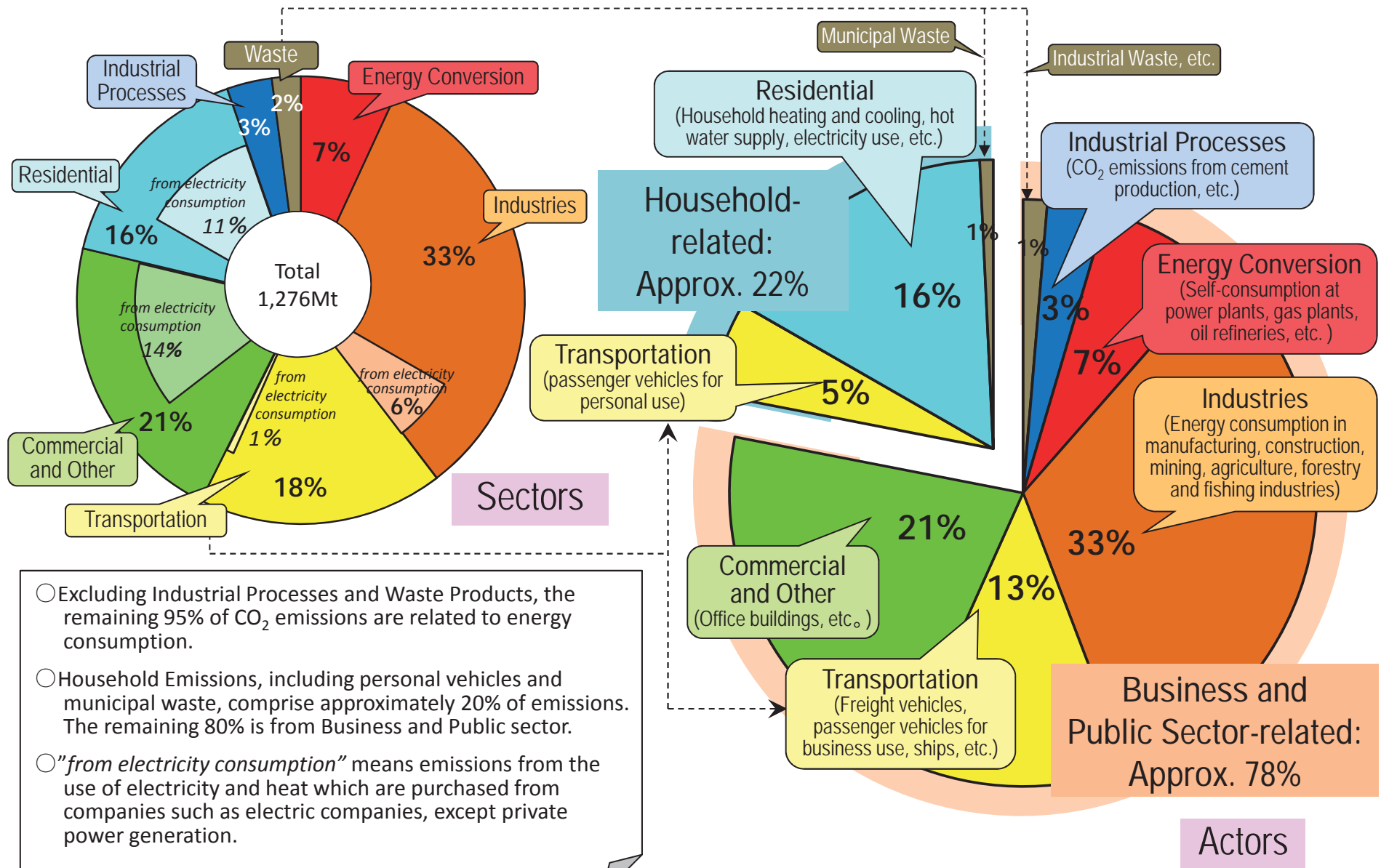
Taking into account **forest and other carbon sinks** and **Kyoto mechanisms credits**, the averaged annual emission during the first commitment period (2008-2012) of the Kyoto Protocol shows an 8.4% decrease compared to the base year emission

⇒ Japan achieved its 6% reduction target.



- 1: Forest and other carbon sinks: Removals by forest and other carbon sinks (forest carbon sink measures and urban revegetation etc) that can be used toward achieving the target. The removals by forest carbon sink measures exceeded the upper limit (238.3 Mt-CO₂ for the five years) set for Japan for use toward achieving the target, therefore the value is the upper limit per year.
- 2: Kyoto mechanisms credits: Acquired by the government: Total credits that were acquired as of FY2013 year-end through the Kyoto Mechanisms Credit Acquisition Program (97.493 Mt)
Acquired by the private sector: The amount of credits that were acquired by the Federation of Electric Power Companies of Japan (According to the Environmental Action Plan by the Japanese Electric Utility Industry [FY2013])
- 3: Total emissions and removals for the Kyoto Protocol target will be finalized after the technical review process under the Kyoto Protocol and the Convention to be conducted in FY2014. Also, the Kyoto mechanisms credits will be finalized after the true-up period for the first commitment period (expected to be completed in the second half of 2015 or later).

CO₂ emissions by Sectors and Actors (2012)



Change in energy mix for power generation after the earthquake

- After the earthquake disaster, nuclear power plants have been shut down for maintenance, and the share of the nuclear power generation dropped drastically. (Oi nuclear power plant No.3 and 4 were restarted in July 2012)
- On the other hand, power generation from fossil fuels reached approximately 90% of total domestic power generation, including 50% from LNG power plant.

Trends in energy mix for power generation (General/Wholesale Electric utility)



Emissions Reduction Target for 2020

Japan's new emission reduction target in 2020

- Japan's greenhouse gas emission is set as **3.8% emission reduction in 2020 from the 2005 level** in order to implement Cancun agreement, and also based on prime minister's designation of zero-based review of 25% reduction target by COP19
- **This is a target at this point, which has not yet taken into account the emission reduction effect resulting from nuclear power**, given that the energy policy and energy mix, including the utilization of nuclear power are still under consideration
- A firm target, based on further review of the energy policy and energy mix will eventually be set.

【Principles of the new target】

The new target will be achieved by implementing the measures listed below comprehensively, while attaining the economic growth goal set by the current government

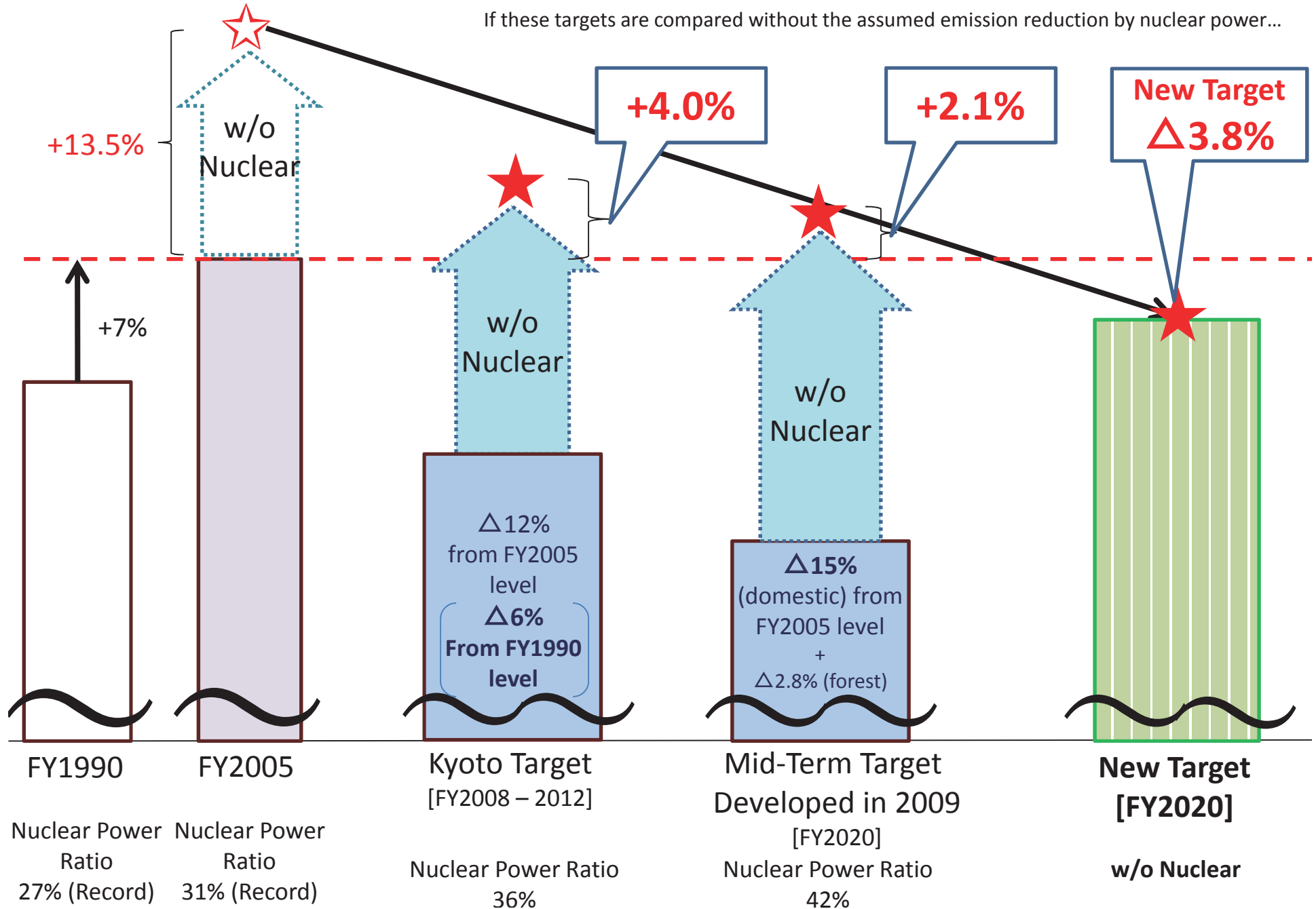
- (1) **20% improvement in energy intensity** which is at the world leading level
- (2) Improvement of emission factor of electricity by **renewable energy** etc.
- (3) **Strengthening fluorocarbons countermeasures** based on amended law on fluorocarbons
- (4) Application of the "**Joint Crediting Mechanism (JCM)**"
- (5) Utilization of **carbon sink of forest**

【Actions in response to the new target】

Register the new target to United Nations Framework Convention on Climate Change Secretariat (29 Nov).
Implement mitigation measures steadily, through Biennial Report submission and International review based on Cancun agreement

New Target vs. Past Targets

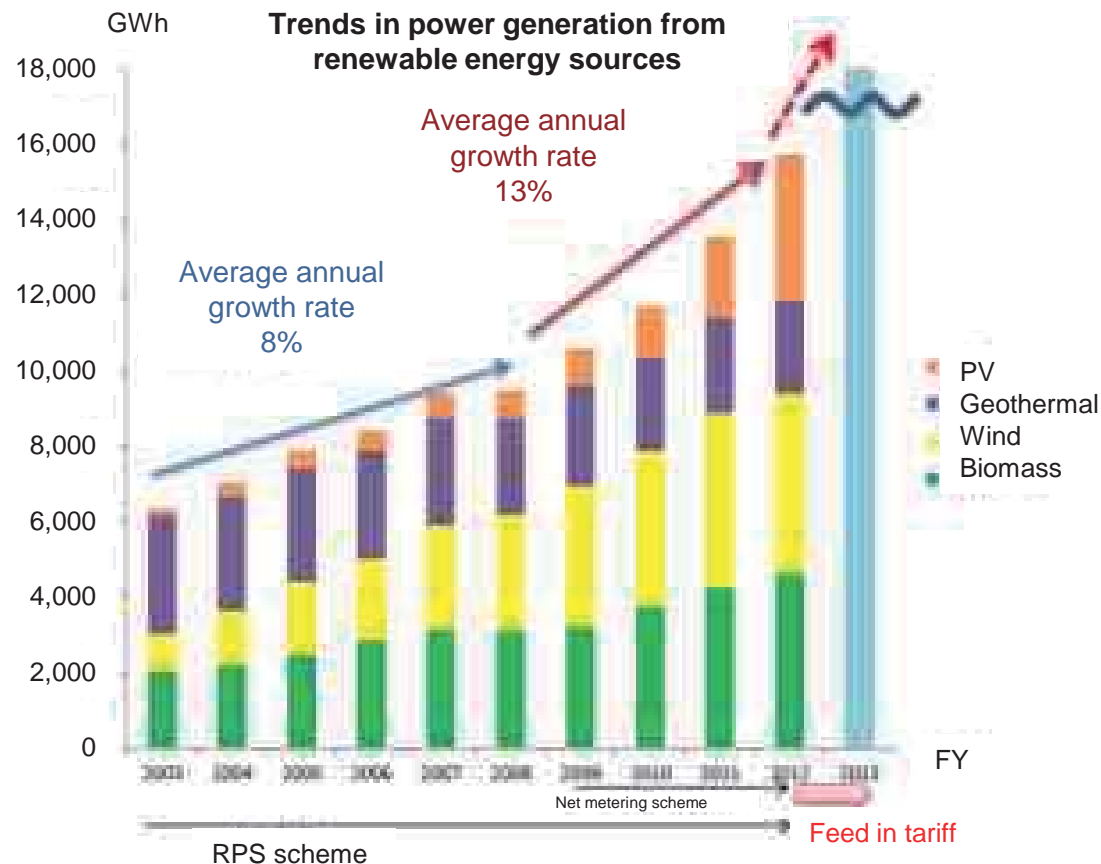
If these targets are compared without the assumed emission reduction by nuclear power...



Examples of Mitigation Measures

Trends in renewable energy power generation

- Share of renewable energy (excluding hydro power) in the total power generation in Japan has been approximately 1%
- Average annual growth rate of the power generated from the renewable energy sources increase to 13% after implementation of PV net metering scheme in Nov 2009 and feed in tariff scheme in July 2012. (The power from renewable energy sources will be 3.4 times higher than that of 2012 after 10 years if the annual growth rate of 13% continues.)

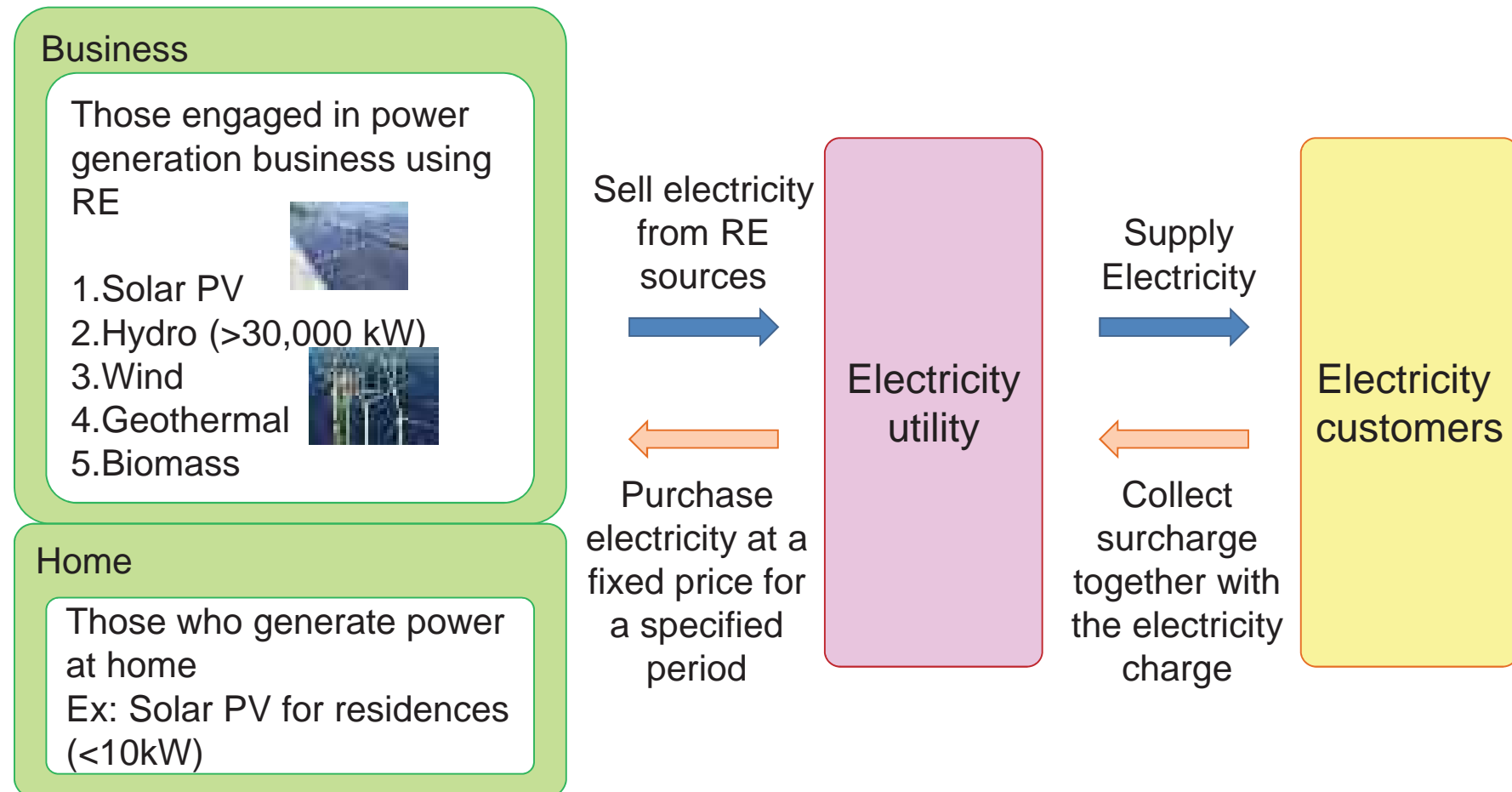


Source: Advisory Committee for Natural Resources and Energy, 3rd meeting of Basic policy subcommittee

Feed-in Tariff for Renewable Energy (RE)

All of generated renewable electricity (except electricity by residential RE equipment) shall be purchased at a fixed price.

The bill for introducing FIT was adopted in August 2011 and came into force on 1 July 2012 .



Practical Application of Floating Offshore Wind Turbine

- Japan is a marine nation with the 6th largest exclusive economic zone in the world. **Wind turbines have more introduction potential offshore than on land.**
- With higher wind speed, the ocean promises **stable and efficient power generation.**
- Having not much in the way of shallow sea areas, Japan **expects much from floating turbines** that can be introduced to deep sea areas (50m or deeper)
- Verification project of floating wind turbines started in FY2010. **Demonstration machines at the pilot scale and commercial scale were installed and operated in FY2012 and FY2013 respectively.** Associated technologies and systems will be established by FY2015 toward practical application.
- Through these demonstrations, Japan aims to expand offshore wind power to more than one million kW by 2020.

Construction, installation, operation and evaluation of Japan's first commercial-scale floating offshore wind turbines

- Full-fledged demonstration off the coast of Kabashima, Goto City, Nagasaki
 - The world's first **hybrid spar** model
- [Significant cost reduction taking advantage of Japanese technologies]

- Design and construction of a floating structure **resistant to typhoons, etc.**
- **Coordination with the fishing industry**/system in harmony with fisheries
- **Environmental assessment method**

In addition, demonstrate technologies and systems to produce hydrogen using surplus electricity in the process of power generation to supply energy for local production for local consumption



In FY2014, gather information concerning full-fledged operation and power generation using the 2000kW commercial-scale equipment, its environmental impact, adaptation to weather conditions, safety, etc. to obtain knowledge toward practical application.

Promotion of Energy Saving

■ Low-carbonization and Energy-savings in Equipment and Devices

Top Runner Program

Top Runner Program requires manufacturers and importers of products to meet criteria which is in line with standards of currently most-advanced devices and assumed technological advances in about 3 to 10 years. The Government is expanding the application of the Top Runner Program onto equipment and devices such as electric water heaters (heat pump water heaters), multifunction machinery and printers, and LED light bulbs were newly added in 2013.

Guidelines for Controlling Greenhouse Gas Emissions

Through the formulation and publication of the Guidelines for Controlling Greenhouse Gas Emissions Based on the Act on Promotion of Global Warming Countermeasures, the Government will encourage business operators to implement energy-saving and low-carbonization business actions on their equipment.

■ Improvement of the Energy-efficiency Performance and Low-carbonization of Housing and Buildings

New housing and buildings

- Gradual approach for the mandatory energy conservation standards for newly constructed housing and buildings by 2020
- Introduction of the Top Runner Program for construction materials and inclusion of thermal insulation material
- Diffusion of low carbon building with a higher energy-efficiency performance
 - Enhancing and diffusing an objective and clarified system for verifying and labeling comprehensive environmental performances of housing and buildings
- Realizing the concept of “Net Zero Energy” for the average energy consumption of new housing and buildings by 2030.

Existing housing and buildings

- Support on retrofits for energy-efficiency improvement and low carbonization
- Support on improvement of the use of equipment and devices
- Provision of consultation on potential capacity of GHG emissions reduction
 - Promotion of energy consumption data
- Discussing multilateral measures for replacing equipment with high-performed one



Low Carbon City Promotion Act (Outline)

Background

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

Outline of Law

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

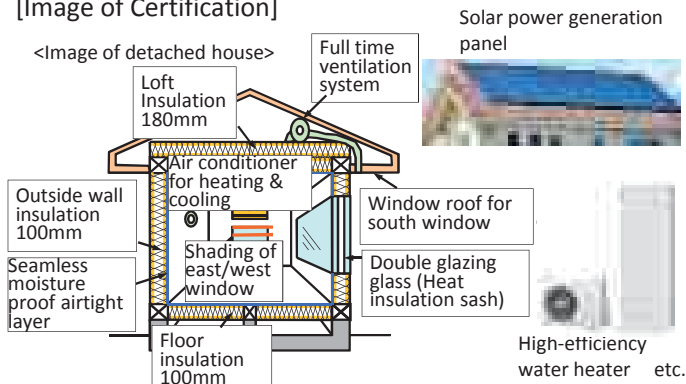
[Income and Other Tax Reduction for Low-Carbon Housing]

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

[Not included in calculation of floor-area ratio]

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

[Image of Certification]



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

Concentration of urban functions

- Concentration of hospital and welfare facility, condominiums, etc.

- ◇ Creation of private-sector certification program
- Development of integrated parking lots by private sector
- ◇ Special case of obligation to build parking lot in new construction

- Pedestrian-friendly city development (footpath and bicycle road development, barrier-free efforts)

Promotion of use of public transportation

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

Promotion of areal management and use of greenery and energy

Low-carbon building

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

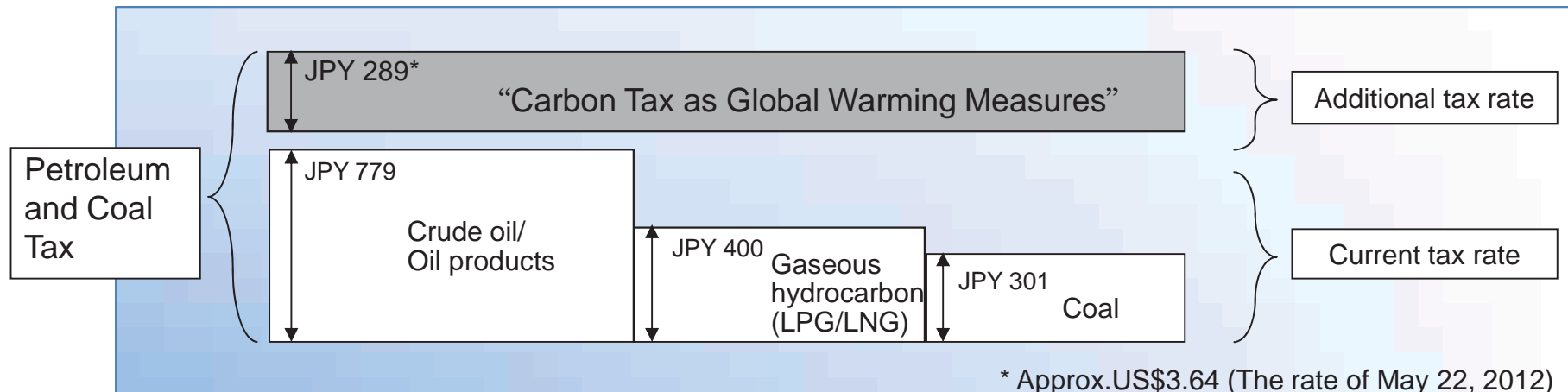
- Conservation and promotion of greenery zones by NPOs
- ◇ Expansion of cooperative management system of planted areas
- Use of unused sewerage heat ◇ special case of sewerage intake by private sector
- Installation of solar power generation and batteries in areas adjacent to city parks and ports and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

New Carbon Tax Scheme

- Tax rate corresponding to the amount of CO₂ emissions for all fossil fuels (JPY 289/t-CO₂)
- Enforced from Oct. 2012 and increases in the tax rate gradually over 3 and a half years
- All the tax revenue will be allocated for curbing energy-originated CO₂ emissions

Tax Rate

Tax Rate per t-CO₂ of “Carbon Tax as Global Warming Measures”



Enforcement Stage

Object of Taxation	Current Tax Rate	From Oct. 1, 2012	From Apr. 1, 2014	From Apr. 1, 2016
Crude oil/Oil products [per 1 kl]	(JPY 2,040)	+ JPY 250 (JPY 2,290)	+ JPY 250 (JPY 2,540)	+ JPY 260 (JPY 2,800)
Gaseous hydrocarbon [per 1 t]	(JPY 1,080)	+ JPY 260 (JPY 1,340)	+ JPY 260 (JPY 1,600)	+ JPY 260 (JPY 1,860)
Coal [per 1 t]	(JPY 700)	+ JPY 220 (JPY 920)	+ JPY 220 (JPY 1,140)	+ JPY 230 (JPY 1,370)

Tax Revenue

[1st year] **JPY 39.1 billion** ; [Normal year] **JPY 262.3 billion** (about US\$3.31 billion)

➔ To be used for introduction of renewable energy and enhancement of energy conservation measures, etc.

CO₂ reduction effect of the tax

○The overall CO₂ reduction effects (both price and revenue effect) from energy is estimated to be -0.5% to -2.2% (6 to 24 million CO₂) in 2020 compared with 1990 levels.

Estimated CO₂ reduction effect by tax for global warming measures

	2020
Price effect	-0.2% (Approx. 1.76 tonnes of CO ₂ reduction)
Revenue effect	-0.4% to -2.1% (Approx. 3.93 to 21.75 million tonnes of CO ₂ reduction)
Total	-0.5% to -2.2% (Approx. 5.69 to 23.5 million tonnes of CO₂ reduction)

Promotion of Low Carbon Investment through Environmental Finance

Issues

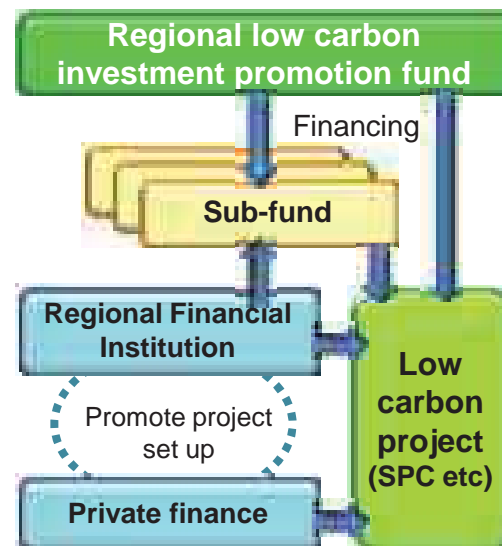
○ To create a low carbon society, a large amount of additional investment is required with **drastic increase in renewable energy and thorough use of energy efficiency measures as pillars**. To this end, **mobilizing private finance is essential**

- Strongly promote “**Low Carbon Society Establishment Finance Initiative**” launched in Jan 2013, and **foster regional low carbon projects across the country through accelerating and mobilizing private finance**
- **Deliver menus based on the needs** of the users including region, business operators and financial organizations

Diffuse regional low carbon investment promotion fund across the country

Set up regional low carbon investment promotion fund which finances low carbon projects, as an incentive for private finance

Expand private investment for low carbon projects which contribute to both CO2 emission mitigation and local revitalization by expanding sub-fund set up in collaboration with regional financial institution



Interest subsidy for expanding environmental financing

Implement interest subsidy to lighten the burden of interest cost and to facilitate smooth financing for low carbon project, as well as to promote finance with environmental viewpoint from both corporate base and project base.

Promote Eco-lease for household and business entity

A part of cost is subsidized, in case low carbon devices are installed by “lease” contract, in order to lighten the burden of household and business entity who cannot afford the upfront cost for the installation

National campaign on solutions to global warming

- Runs “National campaign on solutions to global warming” in order that government and citizens can work together for preventing global warming and shifting towards low carbon society.
- Calls for practicing “6 challenges” proposed in the campaign to citizens and companies, and promote various projects namely, “Cool BIZ”, “Warm BIZ”, “Smart Move”, and “Morning Challenge” Fostering . In order to manage the power shortage by the Great East Japan Earthquake, power conservation actions are also in place
- Calls for members of “Individual Challenger”, and “Company/organization challengers” who agreed with the national campaign (As of June 2012, Individual: 920,000 members, Companies: 25,000 members)
- Information on latest CO₂ facilities or devises is provided through various measures including SNS

6 Challenges

- Let's choose eco-friendly lifestyle
- Let's choose energy efficient products
- Let's choose renewable energy
- Let's choose eco-friendly house/building
- Let's support products & actions related to CO₂ reduction
- Let's participate in local actions against global warming

7 points of power conservation in house

- Take care to switch off
- Reduce stand by power losses
- Power conservation through air-conditioner
- Power conservation through refrigerator
- Power conservation through lighting
- Power conservation through TV
- Other power conservation

Super Cool Biz

Suggestion of comfortable lifestyle even in the room temperature settings of 28 degree Celsius



Warm Biz

Suggestion of comfortable lifestyle even in the room temperature settings of 20 degree Celsius



Poster of Cool Biz

Smart Move – Eco transportation-

Suggestions of low CO₂ emissions move to reduce CO₂ emissions associated with transportation

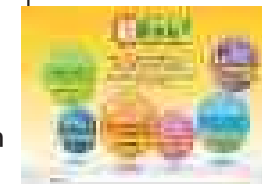
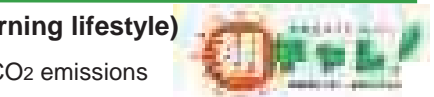
Not only environmental friendly but also comfort, convenient and healthy lifestyle is named “smart move” and promote to company, organization and public



Morning Challenge! (Challenge to morning lifestyle)

Suggestions of new morning lifestyle to reduce CO₂ emissions

CO₂ reduction effects
 Shorten the use of lighting, Air-conditioner, TV for 1 hour/day (annual reduction per household)
 [Lighting] Approx. 85kg of CO₂ reduction
 [Air Conditioner] Approx. 58kg of CO₂ reduction
 [TV] Approx. 22kg of CO₂ reduction
 (Total) Approx. 165kg of CO₂ reduction



Morning Challenge! Website

~Toward Zero Carbon Emission Thermal Power Plants~ Carbon dioxide Capture and Storage (CCS)

- In order to achieve Japan's long term target to reduce greenhouse gas emission by 80% by 2050, zero carbon power plants are absolutely necessary.
- Especially, coal fired power plants, which continue to exhaust large amount of CO₂ during its long lifetime, are recommended to introduce CCS in order to reduce CO₂ emission.



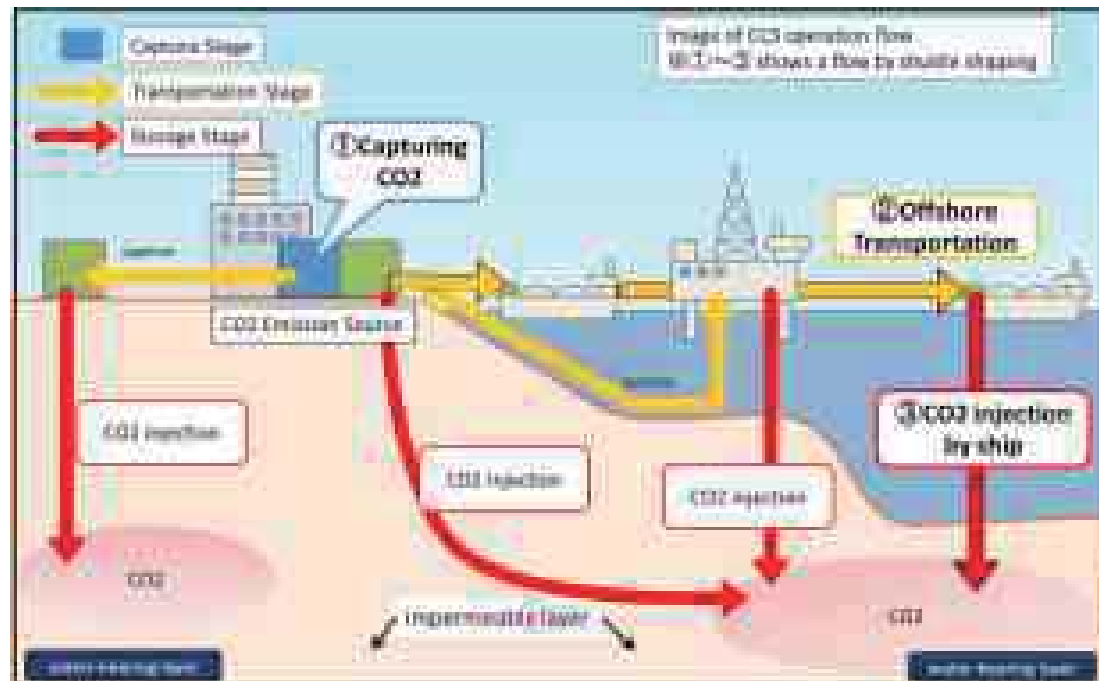
New Project by Ministry of the Environment, Japan (Budget for FY2014 :1,243 Million Yen) Introduction and Promotion of CCS Equipped Zero Carbon Emission Power Plants

1. Survey on potential CO₂ storage site (A joint project with METI)

- Identify potential CO₂ storage sites in waters surrounding Japan, including deep sea area.

2. Feasibility Study on introduction of environmentally friendly CCS technology

- Study an integrated transportation and storage system based on shuttle shipping.
- Assess environmental impact of CO₂ absorbent.





Thank you for your attention