# Japan's Policy for Low-Carbon Societies

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Climate Change: International Pledge
(Submission to UNFCCC, Jan. 2010)

Annex I Parties	Quantified economy-wide emissions targets for 2020	
	Emissions reduction in 2020	Base year
Japan	25% reduction, which is premised on the establishment of a fair and effective international framework in which all major economies participate and on agreement by those economies on ambitious targets.	1990
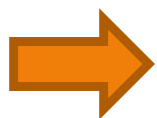
➡ Establishment of domestic framework to achieve this ambitious target is needed

Bill for the Basic Act on Global Warming Countermeasures (re-submitted to Diet in October)

➤ <u>Mid- and Long-term Goals</u>

- **25%** CO_2 reduction below 1990 level by 2020 (premised on the establishment of a fair and effective international framework by all major economies and agreement on their ambitious targets)
- **80%** CO_2 reduction below 1990 level by 2050
- Share of RE in primary energy supply to **10%** by 2020

➤ <u>Key Policy Measure</u>

- Introduction of domestic emission trading scheme (ETS)
- "Greening" tax system and visualization of CO_2
- Enhanced usage of low-/zero- carbon energies including introduction of feed-in tariff (FIT) system for whole renewable energy
- Promotion of energy conservation in equipment, buildings, etc
- Promotion of R&D to foster innovative technological development

Mid- and Long-Term Roadmap for Measures to Address Climate Change

➢ Quantifying the effects of PAMs and draw up a roadmap by sector
➢ Estimating Total GHG emissions from these sectoral roadmaps

Bold actions are needed at all sectors to achieve GHG reduction targets
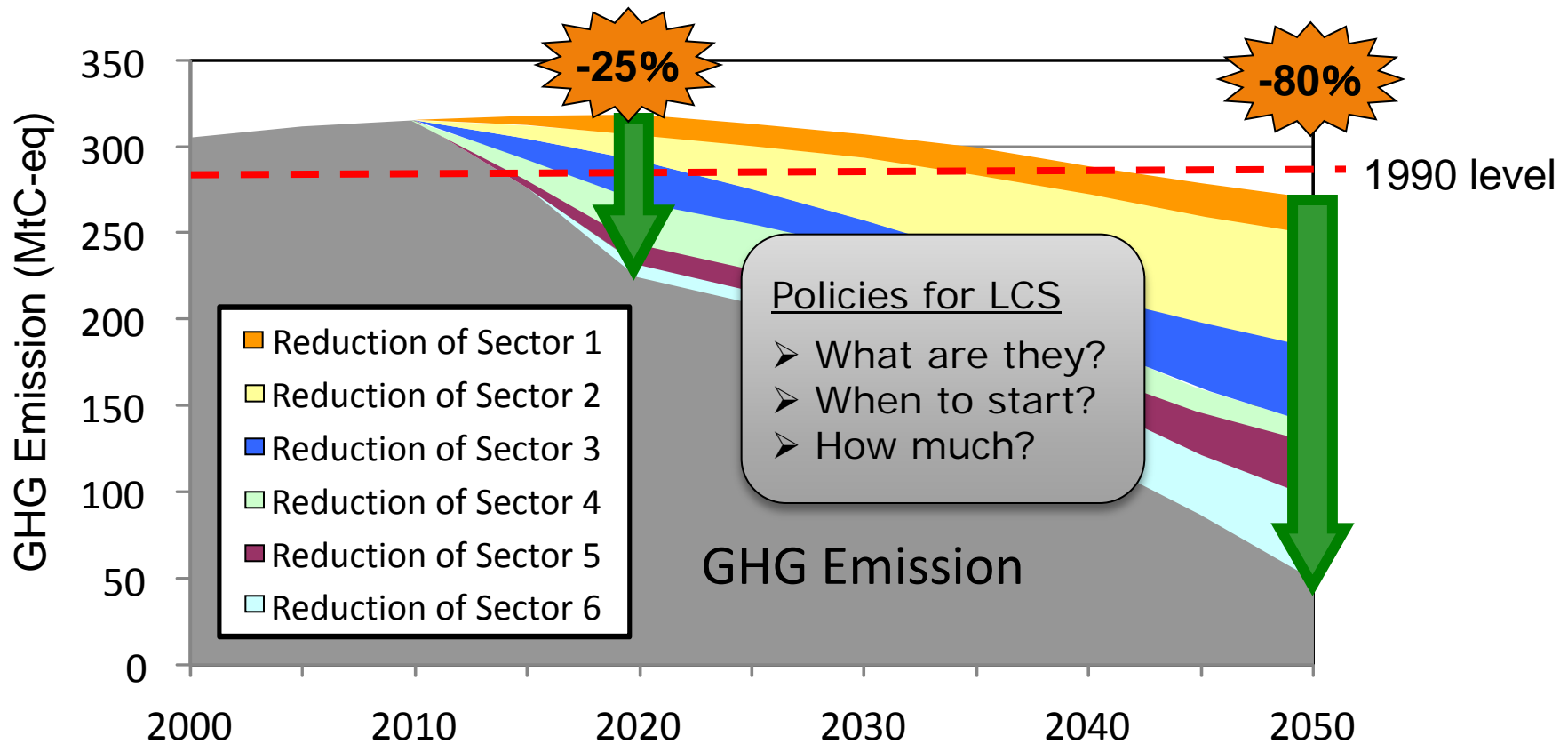
Image of Mid- and Long-term GHG Reduction

Mid- and Long-Term Roadmap WGs

General Meeting

Chair: Dr. Shuzo NISHIOKA
(National Institute for
 Environmental Studies, Japan)

Macro-Framing WG

Communication &
Marketing WG

Manufacturing WG

House and Building WG

Automobile WG

Community Development WG

Rural Community Sub-WG

Energy Supply WG

Secretariat:

- Ministry of the Environment
- Mizuho Information &
  Research Institute, Inc.

etc.

Steps to Complete the Roadmap

1. Considering **future vision** and **major countermeasures** on each sector

2. Selecting **target indices** and setting **target figures** corresponding to the major countermeasures

3. Specifying **barriers** against the achievement of targets and **polices** to overcome the barriers

4. **Drawing a roadmap** based on the policy development schedule and the changes of indices

5. Considering **measures to collaborate with related sectors** to improve the policy effectiveness

Image: Future of medium-sized city

Daily Life - Zero-emission Buildings

<policies and specific actions>

・ Establishment of zero-emission standards that integrate structures (buildings), energy-consuming appliances and other household electronics, and energy-creating devices such as photovoltaic.

・ Compulsory introduction of energy-saving standards and zero-emission standards

・ Creation of a mechanism that makes housing capabilities visible and grants incentives in response to reduction amounts.

（**Target in 2020**）

• 100% achievement rate of standards ranking higher than next-generation standards for new housing

• Max. of 16.4 million (1/3 households) **Approx. 33-fold increase (**Electric heat pump water heaters**)**

Daily Life - Environmentally Friendly Car Market -

<policies and specific actions>

・ Taxation reform based on CO2 emission levels.
・ Phased enhancement of gas mileage standards.
・ Certification of E10 vehicles.
・ Promote the introduction of HVs and EVs.
・ Development of high-performance and next-generation batteries.
・ Promotion of eco driving and car sharing.

（**Target in 2020**）

• Approximately 2.5 million cars (1/2 new car sales)

Community Development
─ Creating Walkable Communities -

<policies and specific actions>
・ Formulate an "Action Plan to a Create Low-carbon Community" in all municipalities.
・ Development of space for sidewalks and bicycles.
・ Support for the promotion of public transportation use.
・ Developing low-carbon municipal districts using natural resources.
・ Making distribution and interregional passenger travel low-carbon.

（**Target　in 2020**）
➢ <u>10% reduction in automobile driving distances</u> by <u>doubling the share</u> of public transportation

Community Development
- Realizing Zero Carbon in Rural Communities-

<policies and specific actions>
・ Promote the use of lumber in buildings, and the use of biomass, as well as the use of forest and farmland etc. as sinks.
・ Expand the application of local energy business models nationwide.

（**Target in 2020**）
➢ About 550,000 hectares trimmed yearly
➢ Promote use of Japanese wood

Creative Manufacturing
- Worldwide -Expansion of Japanese Low-Carbon Manufacturing -

<policies and specific actions>
・ Creation of markets that reward emission-cutting companies.
・ Creating an environment that supports companies financially.
・ Promoting information disclosure through financial reports.
・ A public system for calculated reports that evaluates lifecycle emission amounts.
・ Promotion of R&D to foster innovative technological development
・ Further reduction of CFCs and HCFCs

（Target in 2020）
➢ the world's latest technologies will be introduced when upgrading for all areas
➢ Reduce energy usage by 30-40% by 2050

Social Systems for Creating a Low-Carbon Society

<policies and specific actions>
・ Pricing a carbon/internalization of environmental burden
 (e.g. domestic emission trading scheme and a global warming tax)

Energy Supply
- Next-generation energy supply aimed at a low carbon society -

<policies and specific actions>
・A fixed price buyback system to promote business investment (e.g., IRR of 8% or more) in renewable s.
・Green certification system for heat.
・Cultivating companies and regions that aim to diffuse renewable energies by reducing business risks and initial costs
・Mandatory usage of renewable energies.
・Upgrading the grid and introduction of storage systems to bear large volumes of renewable energy, installation of smart grids.
・Energy efficiency improvement at thermal power plants and enhanced usage of low/zero carbon energy sources in power sector, including expanded use of nuclear power based on the main premise of ensuring safety.
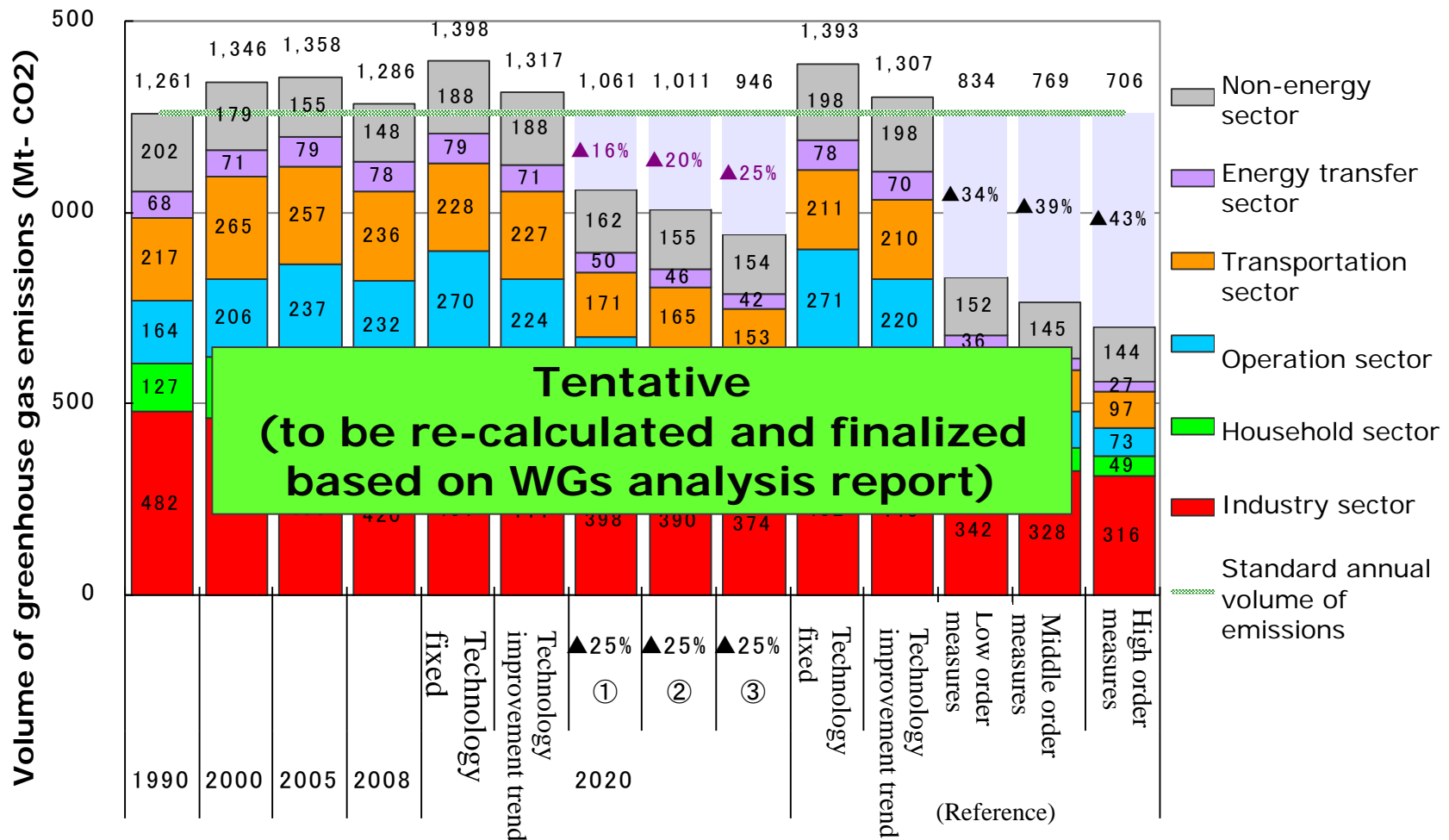
（Target in 2020）
➢10% of primary energy supply to be renewable energy sources by 2020, and 100% diffusion rate of smart grid systems by 2030
➢Solar power generation: 2020: Maximum 50,000 MW(Approx. 35-fold increase)
➢Carbon Capture Storage :Maximum 4.4 million tons of CO_2
➢Nuclear Power Generation: Maximum of 62 plants (expansion of 8 plants), maximum operation rate of 88%.
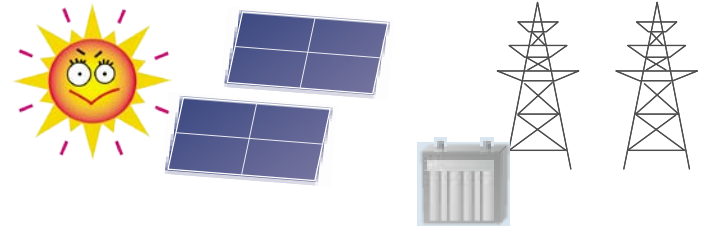
Volume of GHGs emissions [2020/2030]

- It is technically possible to domestically reduce the volume of greenhouse gas emissions by 25% in 2020 compared to the level in 1990.
- Efforts in daily life (household, operations, transportation) will have a major effect.

Volume of greenhouse gas emissions (Mt- CO2)

Legend:
- Non-energy sector
- Energy transfer sector
- Transportation sector
- Operation sector
- Household sector
- Industry sector
- Standard annual volume of emissions

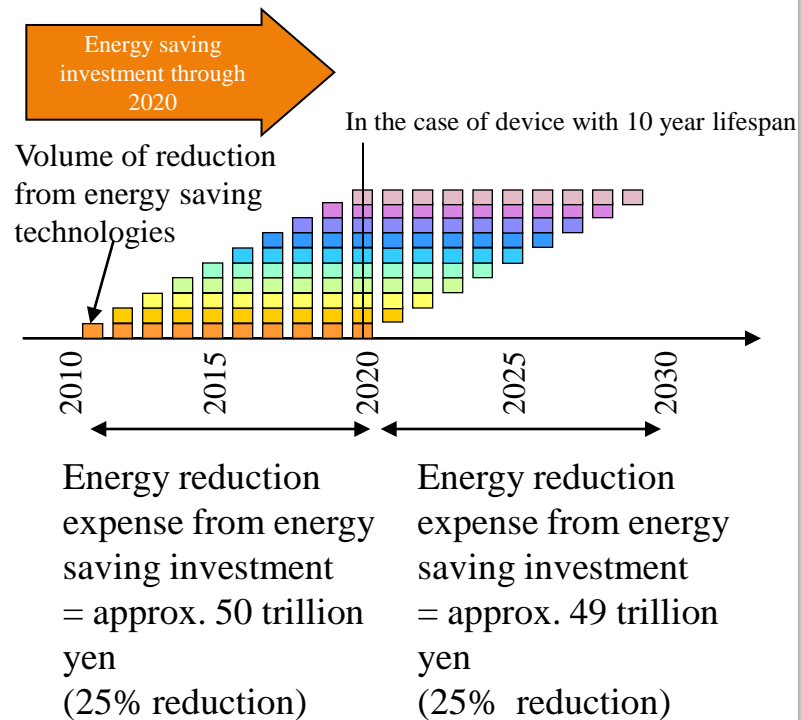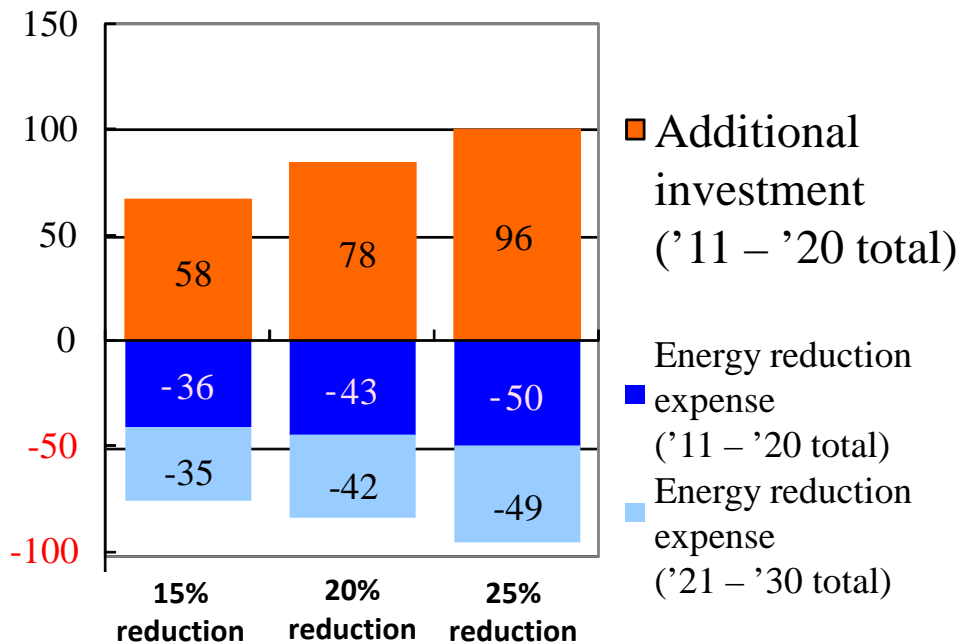**Tentative (to be re-calculated and finalized based on WGs analysis report)**

Note: 2020 25% (1): case including around 10% of international contribution and sinks; 25% (2): case including around 5% of international contribution and sinks; 25% (3): case including no international contribution and sinks. 2030 lower order to high order measures: the emissions volume for 2030 is done assuming that the measures that have been carried out in order to reduce emissions toward the 25% reduction in 2020 will continue to be carried out in 2012 through 2030.

Relationship between low-carbon investment and energy reduction expense (interim report)

• As for the investment amount for global warming, half of the overall investment amount will be collected by 2020 and an amount equal to the investment amount will be collected by 2030 based on energy expenses that can be saved through technologies introduced.

<Low-carbon investment amount and energy reduction expense>

■ Additional investment ('11 – '20 total)

■ Energy reduction expense ('11 – '20 total)

■ Energy reduction expense ('21 – '30 total)

Energy saving investment through 2020

In the case of device with 10 year lifespan

Volume of reduction from energy saving technologies

Energy reduction expense from energy saving investment = approx. 50 trillion yen (25% reduction)

Energy reduction expense from energy saving investment = approx. 49 trillion yen (25% reduction)
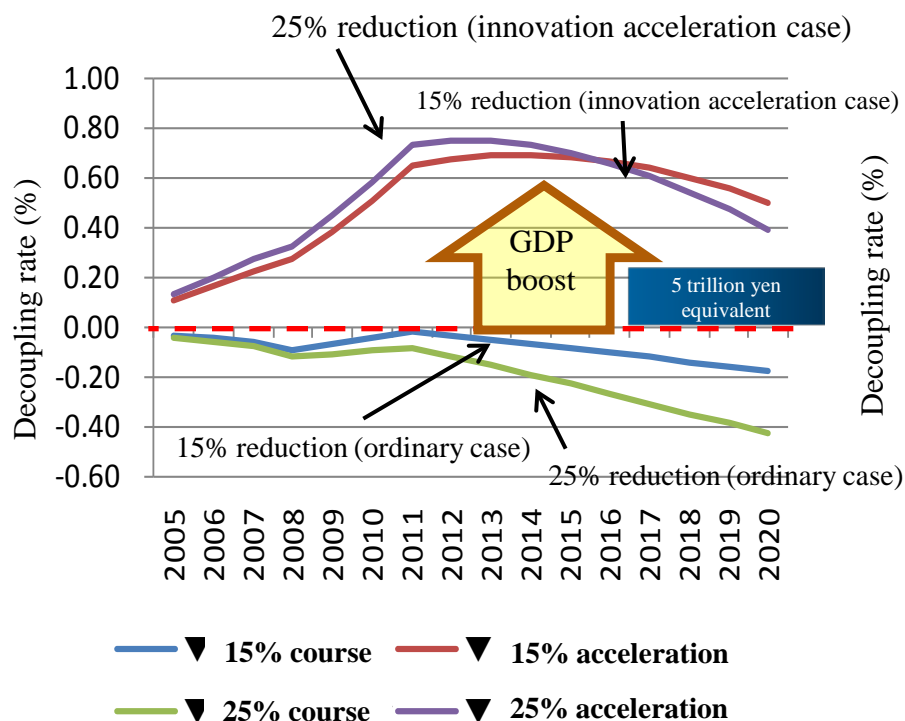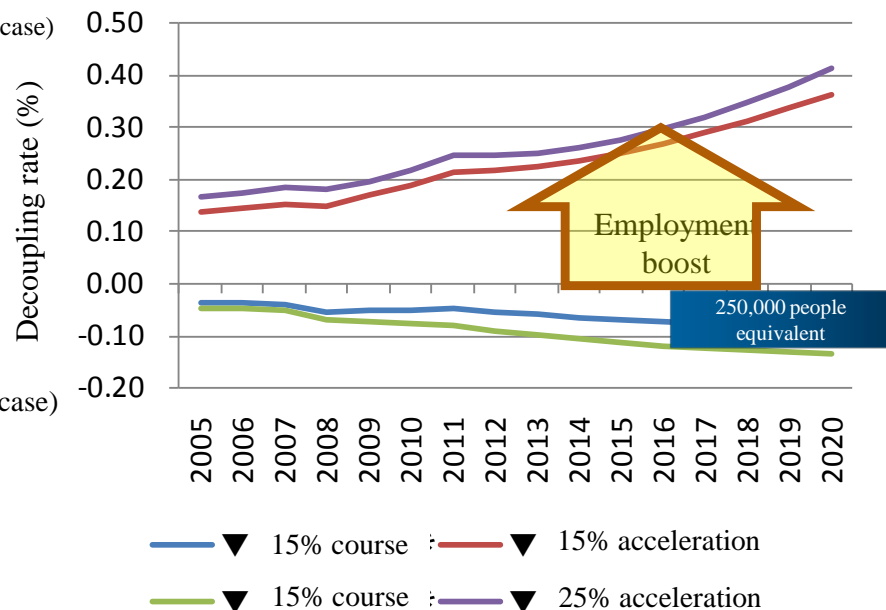
Suggestion from applied general equilibrium model
"If a gear change is done early, the economy will follow along."

● In a forward-looking-type dynamic optimization model incorporating forward-looking investment behavior, there will be a 5 trillion yen increase in GDP as of 2020 (consumption is replaced with assets) and a net increase in employment of 250,000 people when the direction of policy is clarified compared to when it is not clarified, and an early signal has an effect on the low-carbon society direction.

25% reduction (innovation acceleration case)

15% reduction (innovation acceleration case)

Decoupling rate (%)

GDP boost

5 trillion yen equivalent

15% reduction (ordinary case)

25% reduction (ordinary case)

▼ 15% course   ▼ 15% acceleration
▼ 25% course   ▼ 25% acceleration

<Movement of GDP (comparison with course case)>

Decoupling rate (%)

Employment boost

250,000 people equivalent

▼ 15% course   ▼ 15% acceleration
▼ 15% course   ▼ 25% acceleration

<Movement of employment (comparison with course case)>

Research needs

- Evaluation of "cost" toward LCS: cost, insurance or investment?

- Evaluation of economic impacts of early actions of mitigation based on, e.g., game theory.

- Guideline for appropriate interpretation of the results of economic modeling

- Appropriate combination of top-down and bottom-up modeling

- Research on the potential of GHG reduction and appropriate policy measures to enhance mitigation in developing countries.