The Japanese Business Community's Initiative to Tackle Climate Change

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1. Basic Concept

Basic Concept to tackle climate change

(1) Climate change should be addressed globally in the long turn. Technology holds the key tackle this issue
(2) It is important to promote widespread use of BAT (Best Available Technologies) domestically as well as disseminate existing technologies on a global scale.
(3) In addition, developing and diffusing innovative break-through technologies will be essential in order to tackle global warming in the long term.

○T**echnological innovation** is the key to reconcile economic growth and emission reduction.

Kaya identity equation

$$\text{CO2 emissions} = \frac{\text{Energy supply}}{\text{GDP}} \times \frac{\text{CO2 emissions}}{\text{Energy supply}} \times \frac{\text{GDP}}{\text{Population}} \times \text{Population}$$

Level of energy conservation | **Energy cleanliness level** | **Economic activity**

Data input

[Energy consumers]
[Industrial sector]
○ Promotion of energy conservation (Improvement of energy consumption rate)
[Transport sector]
○ Improved fuel economy
[Household sector]
○ Evolving lifestyles

[Energy suppliers]
○ Adoption of renewable energy (biomass, solar, wind power)
○ Promotion of nuclear power
○ High-efficiency thermal power generation (coal, LNG)
○ CCS (carbon capture and sequestration)

Technological innovation and dissemination

2. What have we done so far?

～Promotion of the Keidanren Action Plan～

1997～2012

History of KEIDANREN's Global Warming Countermeasures

Apr. 1991	Keidanren Global Environment Charter released
Jun. 1992	United Nations Earth Summit (Rio de Janeiro)
Jul. 1996	Keidanren Environment Appeal (implementation policy for Action Plan on the Environment) released
Jun. 1997	Keidanren Action Plan on the Environment released
Dec. 1997	Kyoto Protocol adopted
Dec. 1998	First follow-up on Action Plan on the Environment (annual follow-ups thereafter)
Jul. 2002	Establishment of third-party evaluation committee for Keidanren Action Plan on the Environment
Dec. 2009	Keidanren Commitment to a Low Carbon Society (basic policy) released
Jan. 2013	Keidanren Commitment to a Low Carbon Society formulated and released
Apr. 2013 -	Keidanren Commitment to a Low Carbon Society initiated

Overview of the KEIDANREN Action Plan on the Environment

Industrial sector
31 industries
(separate targets for each industry)

Energy conversion sector
3 industries
(separate targets for each industry)

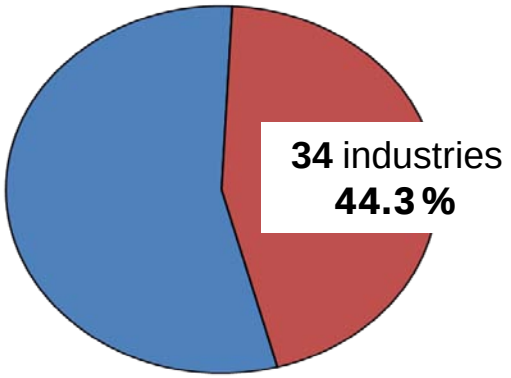
Business operations sector
14 industries
(separate targets for each industry)

Transport sector
13 industries
(separate targets for each industry)

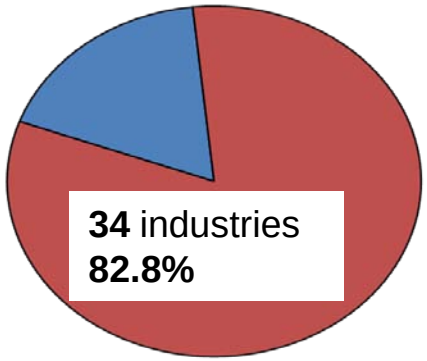
Common target = ±0% change from FY1990 levels (average over FY2008-FY2012)

(1) ***Participants consist of a total of 61 industries or enterprises*** from not only the manufacturing sector, a large energy consumer, but also a wide range of other fields including business operations such as logistics and financial services.
(2) ***With regard to manufacturing processes (at the service provision stage)***, four separate ***quantitative targets*** are set (total CO2 emissions, CO2 emission intensity, total energy consumption, energy consumption rate) and the most appropriate target selected for each process, taking into account differences among industries and business categories.
(3) When results exceed initial predictions, ***more ambitious targets are set***. At the same time, ***in some industries large numbers of CDM (clean development mechanism) credits or other credits are purchased*** in order to meet targets.
(4) ***Annual reviews by government councils (Central Environment Council, Industrial Structure Council) and third-party evaluation committee.***

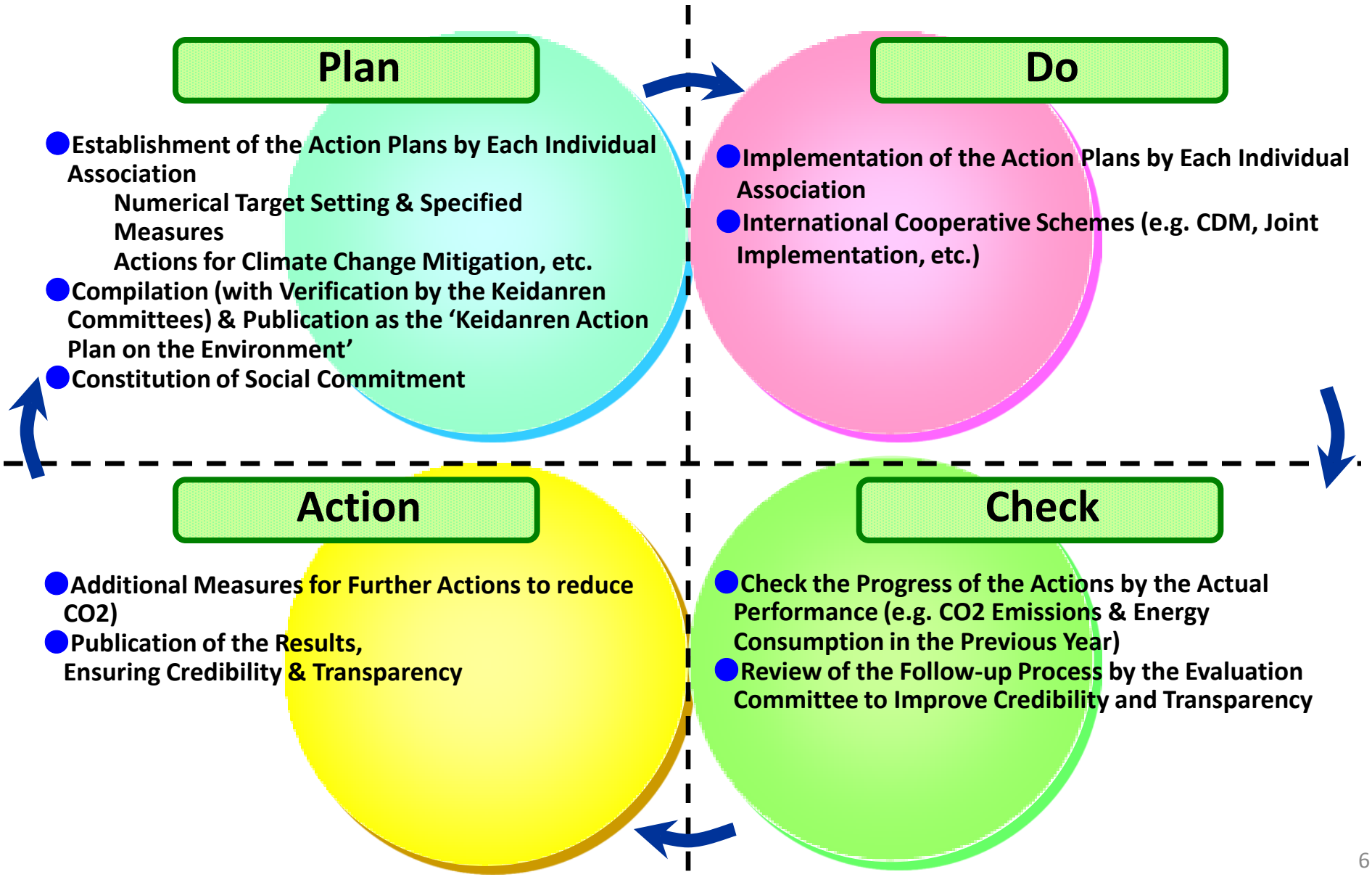
Share of Japan's total CO2 emissions, FY1990
(1,143.4 million tons)



Share of industrial and energy conversion sector CO2 emissions, FY1990
(612.2 million tons)

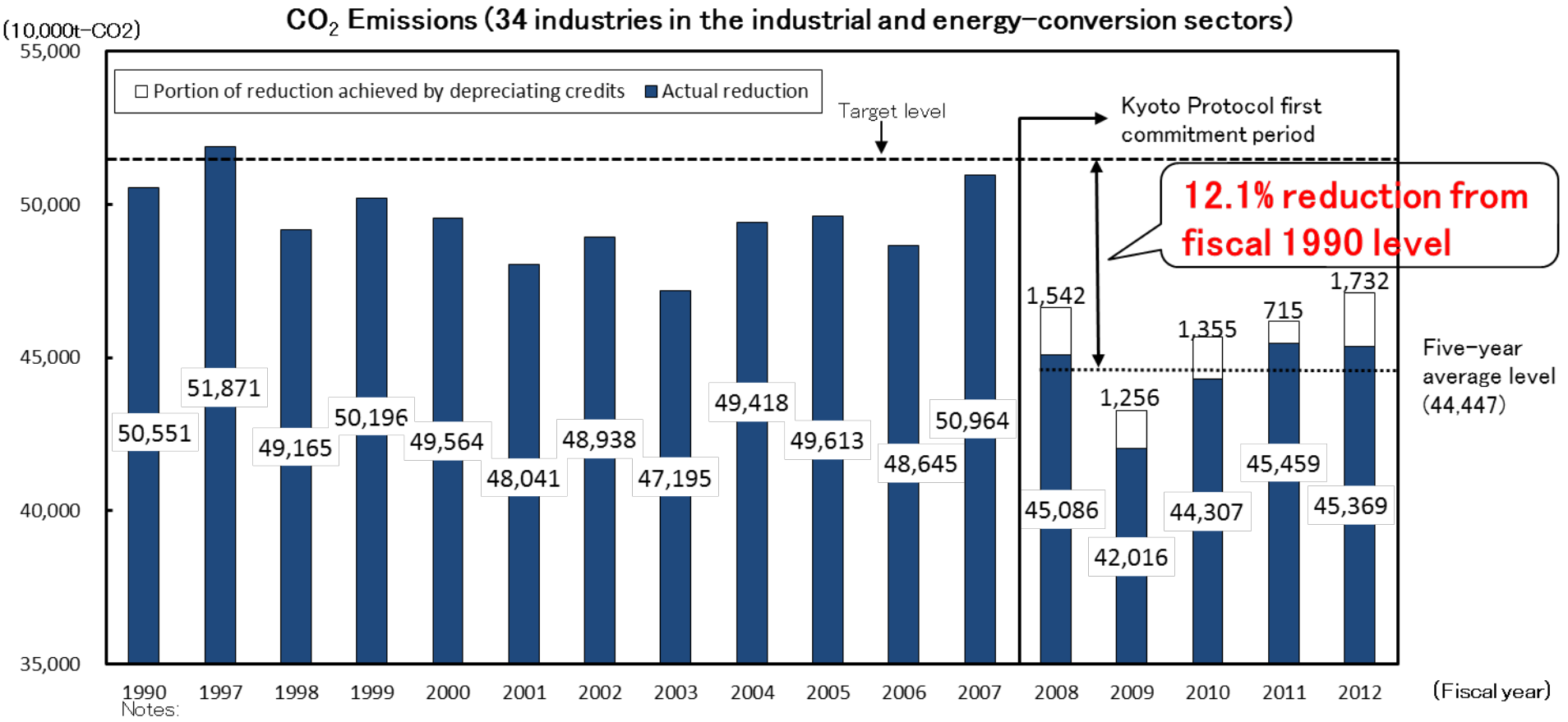


P-D-C-A cycles of the Keidanren Action Plan



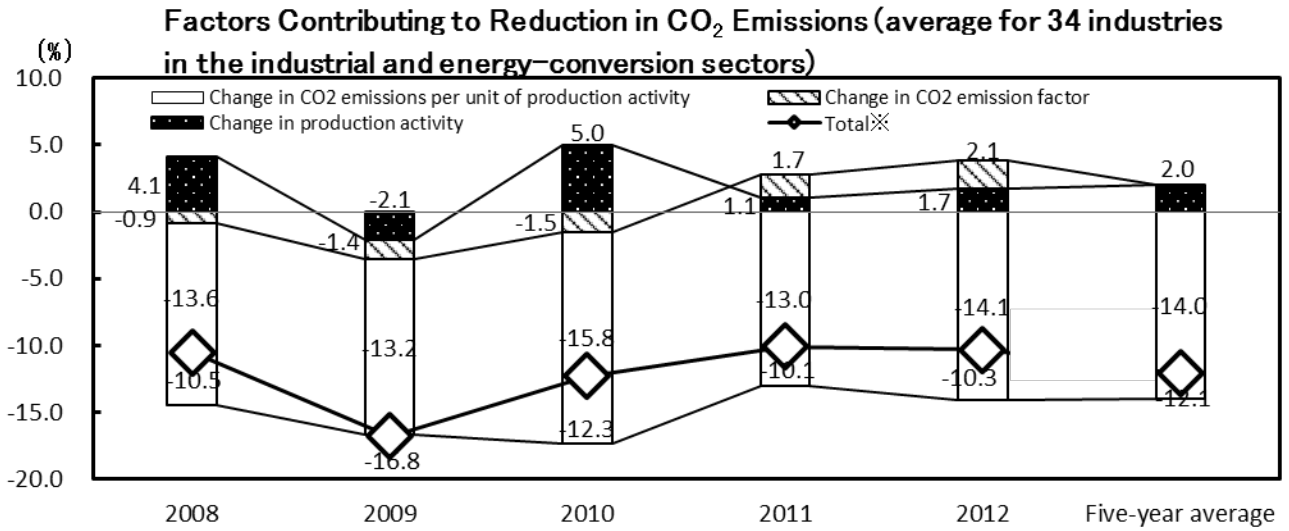
CO2 Emissions by 34 Industries in the Industrial and Energy Converting Sectors

◆With regard to the uniform target (endeavor to reduce average CO_2 emissions from the industrial and energy-conversion sectors between fiscal 2008 and 2012 to below the level of fiscal 1990), participating industries marked a 12.1% reduction, a significant achievement far beyond the initial target.



Notes:
1. Figures from fiscal 2008 onwards show actual reductions and credit depreciation separately.
2. Excluding credit depreciation, the five-year average (fiscal 2008-2012) was a 9.5% reduction from the fiscal 1990 level.

The Attribution of the Follow-Up



Note: Sum of items may differ from total due to rounding.

	Comparison to FY 1990
Change in production activity*1	+2.0%
Change in CO2 emission factor*2	+0.0%
Change in CO2 emissions per unit of output (efficiency improvement)	-14.0%
Total	-12.1%

Efficiency improvement is the driving force to reduce CO2 emissions

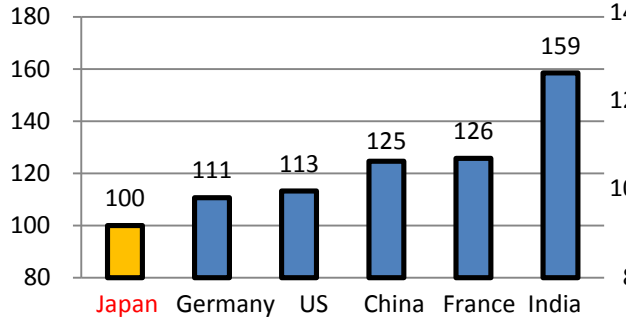
*1 For change in production activity, the indices with the closest relation to energy consumption in each industry were selected.

*2 CO_2/MJ for fuel use and CO_2/kWh for electricity consumption.

International Comparisons of Energy Efficiency in Industrial and Energy-conversion Sectors

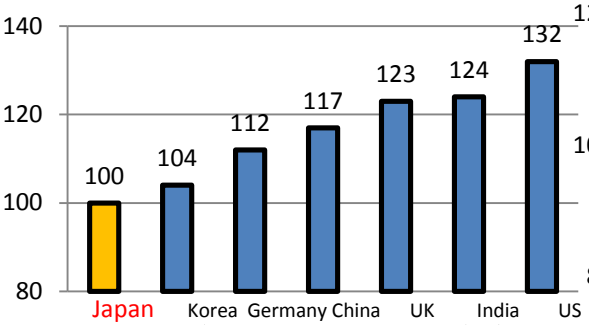
Energy efficiency in key industries is among the world's highest

Energy required to produce 1kWh of electricity through thermal power generation（2010）



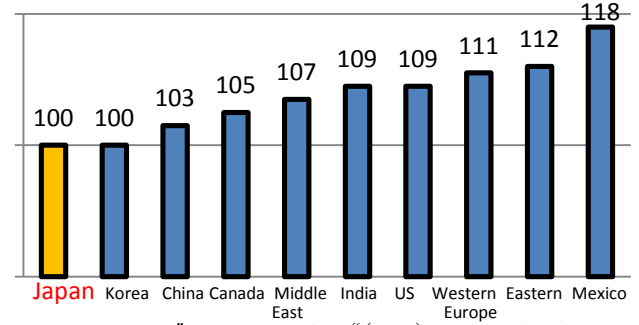
Source: :INTERNATIONAL COMPARISON OF FOSSIL POWER EFFICIENCY AND CO2 INTENSITY(2013) (ECOFYS)

Energy required to produce 1 ton of iron （2010）



Source: Research Institute for Innovative Technology for the Earth, "International Comparison of Energy Efficiency"

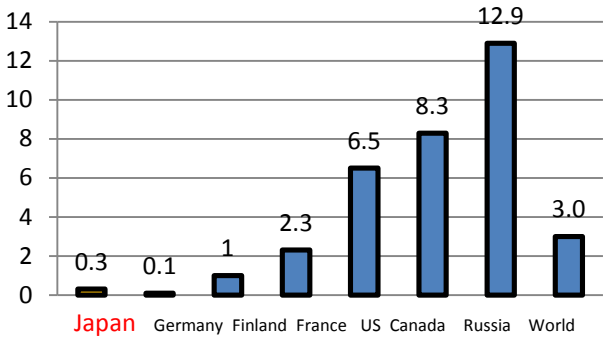
Energy required to produce 1 ton of electrolytic caustic soda（2009）



Source：CMAI "Capacity Database"(2009), Japan Soda Industry Association "Soda Handbook" (2009)

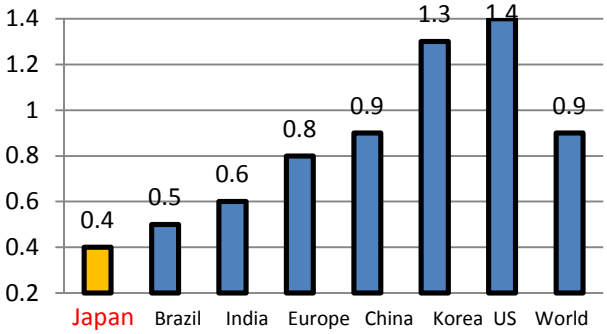
Japanese industries' have introduced Best Available Technologies aggressively.

Energy saving potential by adopting BAT (Pulp and Paper)（GJ/T）



Source: IEA Energy Technology Perspective 2012

Energy saving potential by adopting BAT (Cement)（GJ/T）



Source: IEA Energy Technology Perspective 2010

Industries which raised their targets

- All Japan Freight Forwarders Association (twice)
- Association of Japanese Private Railways
- Brewers Association of Japan
- Flat Glass Manufacturers Association of Japan
- Four electrical/electronics-related groups
- Japan Aluminium Association
- Japan Association of Rolling Stock Industries
- Japan Automobile Manufacturers Association (three times)
- Japan Cement Association; Japan Chemical Industry Association
- Japan Copper and Brass Association
- Japan Department Stores Association (twice)
- Japan Federation of Construction Contractors
- Japan Federation of Housing Organizations
- Japan Foreign Trade Council
- Japan Gas Association (three times)
- Japan Mining Industry Association
- Japan Paper Association (twice)
- Japan Rubber Manufacturers Association (twice)
- Japan Sanitary Equipment Industry Association
- Japan Sugar Refiners' Association
- Japan Trucking Association
- Japanese Electric Wire & Cable Makers' Association (three times)
- Japanese Ship-owners Association
- KDDI
- Lime Manufacture Association (twice)
- Petroleum Association of Japan
- Real Estate Companies Association of Japan;
- Scheduled Airlines Association of Japan (twice)

The role of Keidanren Action Plan in Japanese Government's Climate Change Policy

Quoted in the Government's Kyoto Protocol Target Achievement Plan (Government Decision: 28 March 2008)

"These voluntary action plans by business operators have thus far produced results and the voluntary action plans of Nippon Keidanren are, in particular, playing a central role in countermeasures in the industrial community. The advantages of a voluntary instrument include the ease of selection of superior countermeasures for each actor based on its originality and ingenuity, the likelihood of providing incentives to pursue aggressive targets, and no procedural costs for both the Government and implementing actors. It is expected that these advantages will be further exploited in voluntary action plans by business operators."

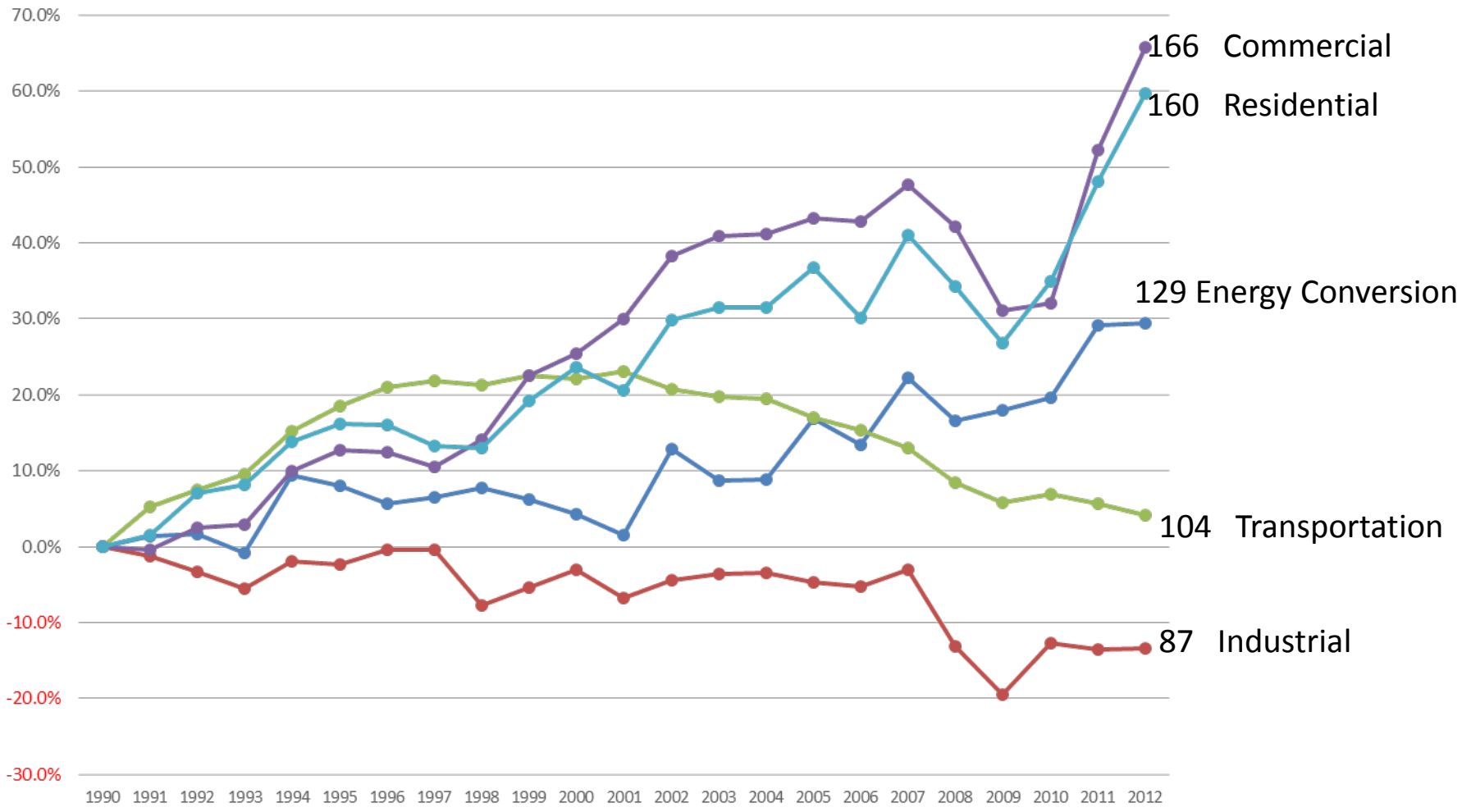
3. Where are we heading?

～ KEIDANREN's Commitment to a Low Carbon Society～

2013～2050

15 Dec. 2009	**Announced the "Basic Concept"**
17 Jan. 2013	**Released the "Commitment" integrating participating industries' action plans (as of January 2013)**
1 Apr. 2013	**Launch its PDCA cycle for the "Commitment" for 2013 onwards**

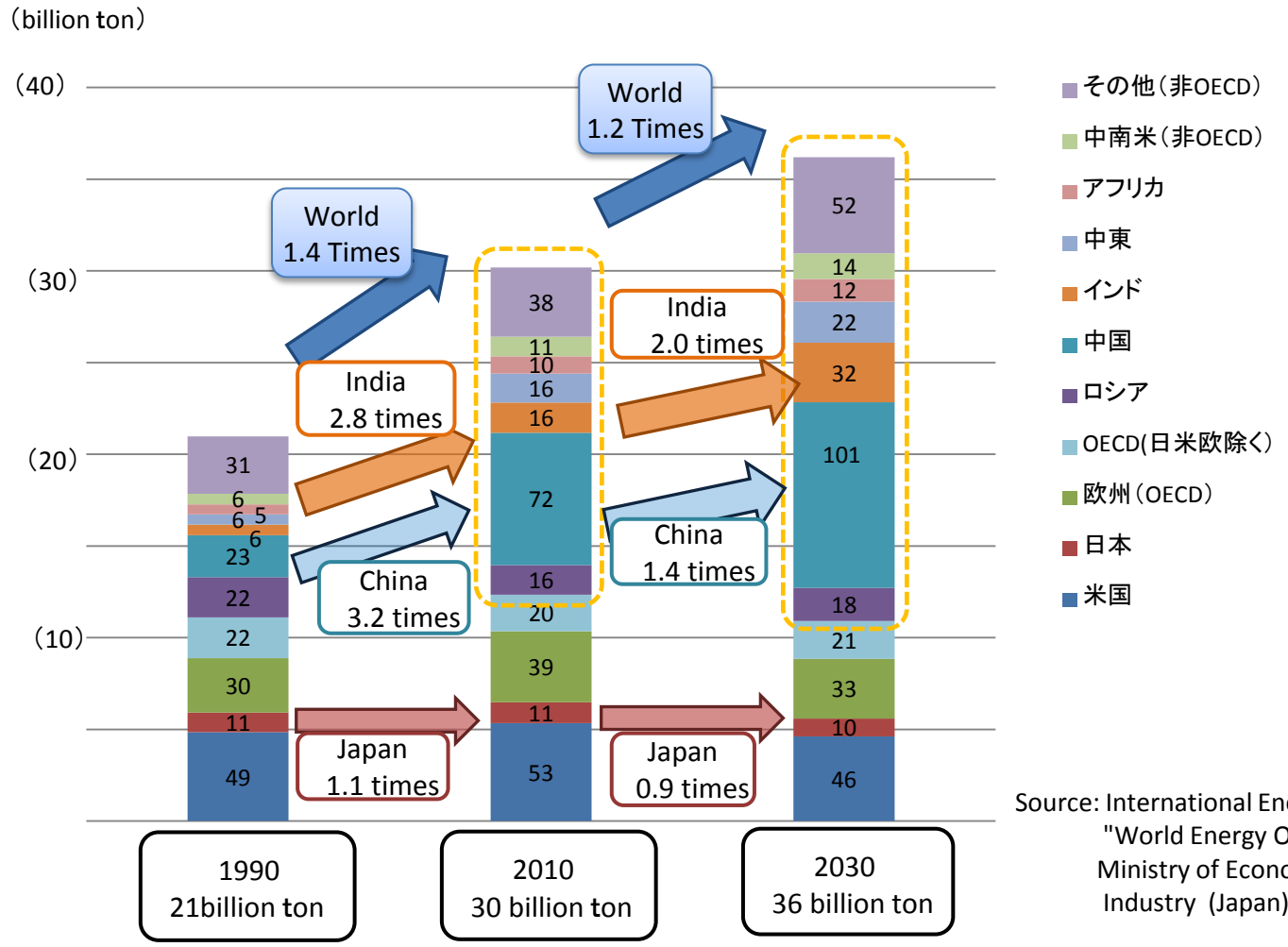
Japan's CO2 Emission Per Sector



Source: Ministry of Environment, Japan

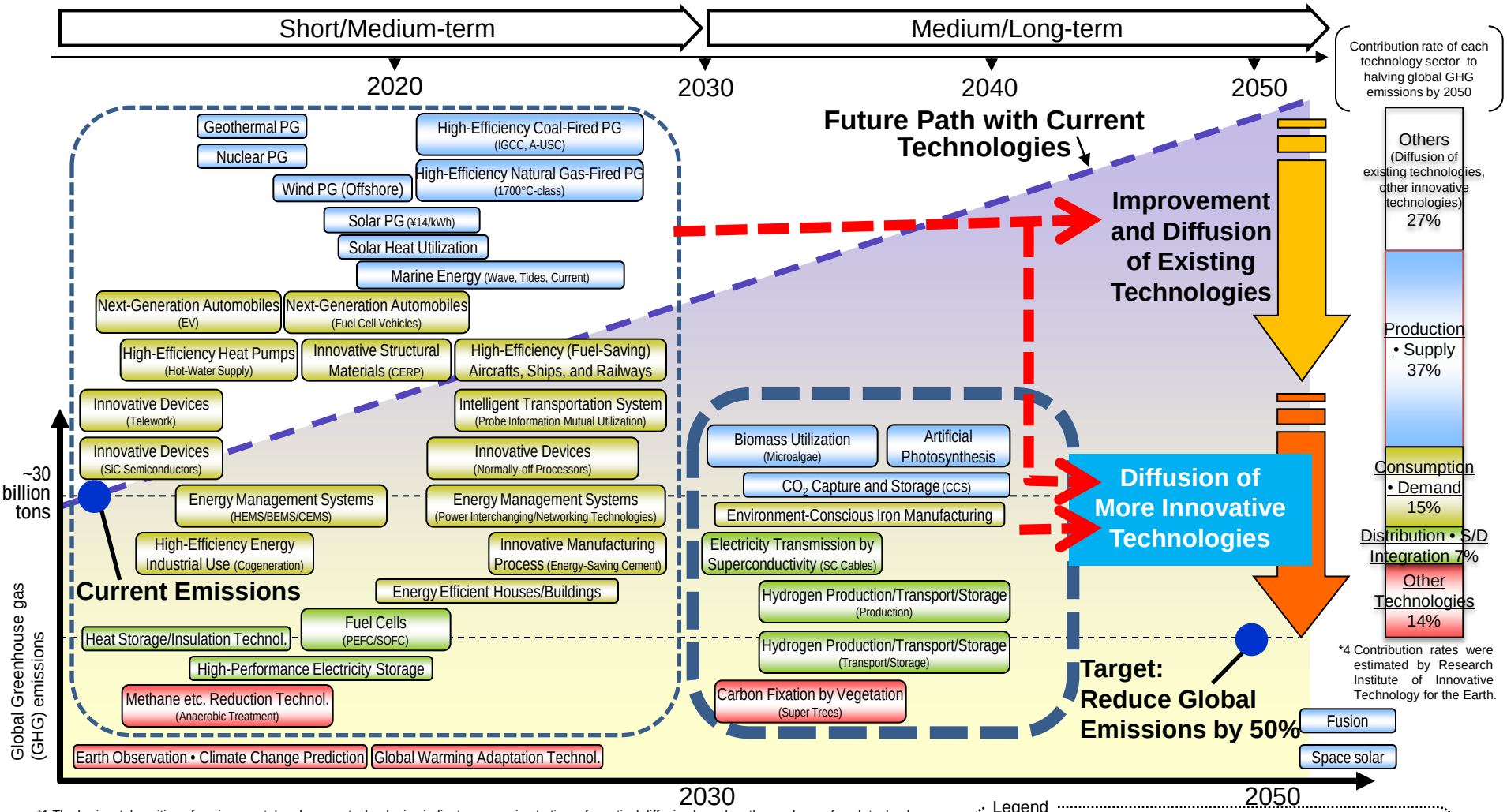
CO2 Emission Worldwide

■ Emission from developing countries such as China, India, and the Middle East is expected to increase drastically in the future.



Source: International Energy Agency "World Energy Outlook 2012", Ministry of Economy, Trade and Industry (Japan)

The Importance of Innovative Technology



*1 The horizontal position of environmental and energy technologies indicates approximate time of practical diffusion based on the roadmap of each technology.
*2 "Future path with current technologies" indicates approximate transition of global GHG emissions assuming no change in efficiencies for existing technologies (e.g., generating efficiency of coal-fired generation)
*3 The downward arrows for "Improvement and diffusion of existing technologies" and "Diffusion of innovative technologies" indicate both contributions are required to reduce global GHG emissions; they do not specify the amount of reduction by each contribution.

Legend
Production • Supply
Consumption • Demand
Distribution • S/D Integration
Other Technologies

*1 Center of bars indicates approximate time of practical diffusion.
*2 Parentheses show technology examples. Refer to the full text for details.

Source: Ministry of Economy Trade and Industry

KEIDANREN's Commitment to a Low Carbon Society

Domestic Measures

Corporate Operations

Industrial Sector | Business Sector | Transportation Sector

1 ✓ Set reduction targets assuming widespread implementation of the best available technologies for the low carbon path.
* Demonstrate viability of targeted reduction levels.

Explore ways of guaranteeing reduction targets will be achieved.

Stronger collaboration with consumers, etc.

2
- ✓ Development and commercial adoption of world-leading energy-saving products and services
- ✓ Efforts to educate employees and provide information to consumers

International Contributions

3
- ✓ Transfers of advanced technology and expertise to motivated developing countries in compliance with international rules
- ✓ Reinforcement of private-led undertakings in international cooperation

Development of Innovative Technologies

4
- ✓ Formulation and pursuit of sector-specific, medium- to long-range technology development road maps leading to the creation of a low carbon society on a global scale

Year 2020: Strengthening of domestic GHG reduction measures

Contribution to the global goal of halving GHG emissions by the year 2050

Participating Industries

* as of August 2014

■ 55 industries are participating.

【Industrial Sector】
① Japan Iron and Steel Federation
② Japan Chemical Industry Association
③ Japan Paper Association
④ Japan Electrical Manufacturers' Association, Japan Electronics and Information Technology Industries Association, Communications and Information network Association of Japan, Japan Business Machine and Information System Industries Association
⑤ Japan Cement Association
⑥ Japan Automobile Manufacturers Association (JAMA) and Japan Auto-Body Industries Association (JABIA)
⑦ Japan Auto Parts Industries Association
⑧ Japan Mining Industry Association
⑨ Japan Federation of Construction Contractors
⑩ Japan Federation of Housing Organizations (Judanren)
⑪ Lime Manufacturing Association
⑫ The Japan Rubber Manufacturers Association
⑬ The Federation of Pharmaceutical Manufactures' Associations of JAPAN
⑭ Japan Aluminum Association
⑮ Japan Federation of Printing Industries
⑯ Flat Glass Association
⑰ The Japan Soft Drinks Association
⑱ Japan Dairy Industry Association
⑲ Japan Electric Wire and Cable Makers' Association
⑳ Japan Bearing Industrial Association
- Japan Society of Industrial Machinery Manufacturers
- Japan Petroleum Development Association
- Japan Brass Makers Association
- Brewers Association of Japan
- The Shipbuilders' Association of Japan, The Cooperative Association of Japan Shipbuilders
- Limestone Association of Japan
- Japan Machine Tool Builders' Association
- Japan Sanitary Equipment Industry Association
- Flour Millers Association
- Japan Industrial Vehicle Association
- Japan Association of Rolling Stock Industries

【Energy-Conversion sector】
①The Federation of Electric Companies of Japan (FEPC)
② Petroleum Association of Japan
③ Japan Gas Association of Japan

【Commercial Sector】
① Japan Chain Stores Association (JCA)
② Telecommunications Carriers Association
③ Japan Franchise Association
④ Japan Department Stores Association
⑤ Japan Association of Refrigerated Warehouses
⑥ Japanese Bankers Association
⑦ The Life Insurance Association of Japan (LIAJ)
⑧ Japan Foreign Trade Council
⑨ The General Insurance Association of Japan
⑩ Japan LP Gas Association
⑪ The Real Estate Companies Association of Japan
⑫ Japan Building Owners and Managers Association

【Transportation Sector】
① The Japanese Shipowners' Association (JSA)
② Japan Trucking Association
③ The Scheduled Airlines Associations of Japan
④ Japan Federation of Coastal Shipping Associations
⑤ Non-governmental Railways Association
⑥ East Japan Railway Company
⑦ West Japan Railway Company
⑧ Central Japan Railway Company
⑨ All Japan Freight Forwarders Association

The role of Keidanren Action Plan in Japanese Government's Climate Change Policy

Interim Policy on Global Warming Measures

(Decision made by Headquarters for Global Warming Measures, 15 March 2013)

Regarding sector-specific measures to cope with CO2 emissions of energy origin, voluntary approaches taken by industries participating to the Commitment to a Low Carbon Society shall undergo evaluation and verification, and institutional measures, including the formulation, announcement and implementation of guidelines on emission regulations, and various support measures shall be promoted.

*provisional translation

4. Further Challenges by the Japanese Business Community

～Phase 2 of our Commitment to a Low Carbon Society～

Overview on Countermeasures on Global Warming

	2008～2012	2013～2020	Post 2020
International Framework	➢ Countries participated to Kyoto Protocol undertook reduction commitments.	➢ Pledge and review under Cancun Agreements	➢ Adopt a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties ➢ Intended nationally determined contributions ..in advance of COP21 (by the first quarter of 2015 by those Parties ready to do so)
Japanese Government	➢ 6% decrease compared to 1990（achieved） ➢ Promoted policies and measures based on Kyoto Protocol Target Achievement Plan	➢ 3.8% emission reduction from 2005 ➢ A firm target will eventually be set.	➢ Estimated to discuss policies at the latter half of 2014 (fiscal year).
		➢ Intend to formulate New Global Warming Measures Plan.	
KEIDANREN's Initiative	➢ **Promoted Voluntary Action Plan**	➢ **Promote KEIDANREN's Commitment to a Low Carbon Society**	➢ **Promote Phase 2 of KEIDANREN's Commitment to a Low Carbon Society**

＊KEIDANREN's Commitment to a Low Carbon Society is based on four pillars (p16).
Time period above is about the first pillar (Domestic emission target).

KEIDANREN's Commitment to a Low Carbon Society Phase 2

- Endeavor to expand our efforts based on the Commitment to a Low Carbon Society in order to further enhance our contribution to long-term measures against global warming.

Four Pillars of the Action Plan

1. **Emissions from domestic business operations**
2. **Strengthened cooperation with other interested groups, including consumers and customers**
3. **Contributions at the international level, including technology transfer to developing countries**
4. **Development of innovative technologies**

Targets etc. shall be established for 2030, in addition to those for 2020

Efforts shall be enhanced to the extent possible

- In order to ensure the effectiveness, transparency and credibility, KEIDANREN shall continually encourage the implementation of the PDCA cycle.
- It will become increasingly important to consider various factors, such as structural changes in society and industry or advancements made in technological innovation.

5. KEIDANREN's Opinion

～ on Climate Change Policy ～

Opinion on Climate Change Policy

National Target

(1) Should adopt a bottom-up approach and aggregating individual efforts that will have a direct impact on reductions, instead of being bound to rates of reduction from emission levels of certain baseline years.
(2) Should make a realistic energy policy that enables the achievement of Japan's growth strategy (Abenomics).
(3) Should ensure international fairness, feasibility of implementation, and appropriateness of the burden on the people.

Domestic Countermeasures

(1) Incorporate the Commitment to a Low Carbon Society into Government policies (such as the Action Plan for Global Warming Countermeasures, etc.), as the pillar of industrial measures.
(2) Should not adopt cap-and-trade style domestic emission trading scheme which not only hinder corporate initiatives taken from an LCA perspective but also slow R&D efforts by enabling companies to meet targets by simply purchasing credits.

ETS Should not be Introduced in Japan

1. Hinder corporate initiatives taken from an LCA perspective

- Even if companies produce products which contributes to emission reduction throughout its lifecycle, they may be forced to purchase credits if emission from the productive process increases and exceeds the cap.

2. Hamper technological innovation

- If companies are able to purchase emission credits, they can achieve targets without curbing emissions and may have less R&D motivation.
- If funds allocated to development of innovative technology are instead dedicated to purchasing emission credits, tech investment will suffer

3. It could cause carbon leakage and run counter to global warming

- It could cause carbon leakage and run counter to global warming.

ETS Should not be Introduced in Japan

4. Could interfere with fair competition among enterprises

- Emissions trading schemes characteristically cause disadvantage to companies that step up manufacturing of products that win popular approval, and advantage to companies that cut production because products fail to win approval.

⇩

Disadvantage for companies which make preferred products.

5. Could detract from the competitiveness of Japanese industry

- To curb greenhouse gases more than it could be achieved through BAT, there is no alternative but cutting production or purchasing credits. This could severely impact the economy and employment.

The importance of assessing entire lifecycles

- Industry works to develop and supply energy-efficient products.
- However, supplying energy-efficient products may entail increased emissions during manufacturing stage.

◆ Tracking only emissions from manufacturing and imposing inflexible caps is irrational from the perspective of low-carbon society formation.

◆ It is essential to track emissions over a product's entire lifecycle including materials procurement, manufacturing, use, etc.

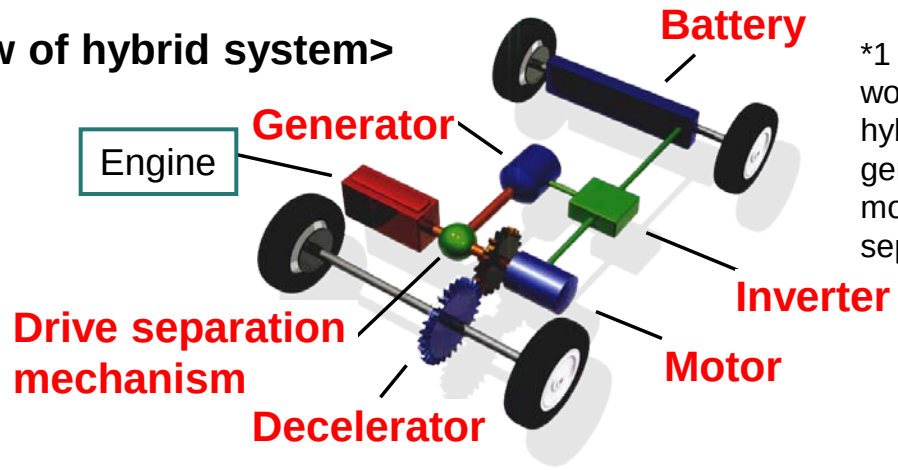
*In some cases, a product produces less CO2 during usage, but its manufacture generates more CO2 than that of a conventional product (manufacture generates more, but seen comprehensively the new product contributes to curbing CO2 emissions.)
*In some cases, the high-performance materials required for low-carbon products are manufactured in small lots with many steps in the manufacturing process, and thus produce more CO2 during the manufacturing stage.
*Pre-treatment of recycled waste products consumes energy, thus while recycling contributes to formation of a cyclical consumer society, it boosts CO2 emissions.
*Switching from conventional water heaters and air conditioners to heat pump models, or from traditional motor vehicles to electric vehicles, curbs CO2 emissions overall but boosts emissions from the electric power sector.
*As IT advances, more efficient business operations cut CO2 emissions for the whole of society, but emissions resulting from growing IT device use are rising.

The importance of assessing entire lifecycles

CO2 reduction throughout life cycle (hybrid vehicle life cycle assessment)

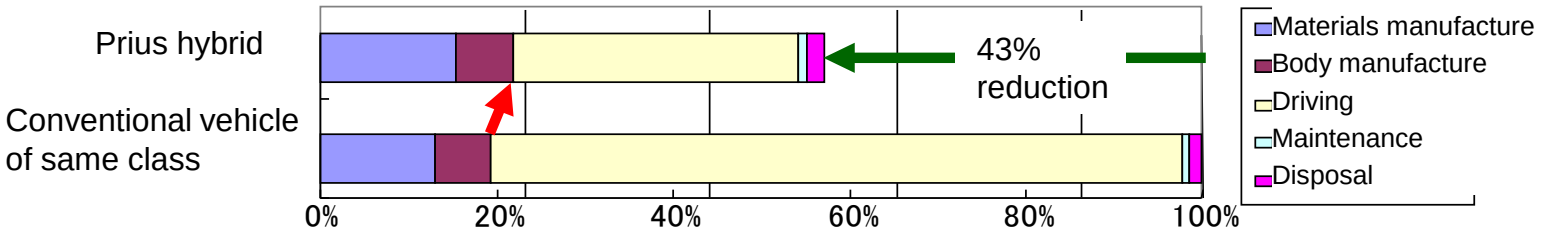
Because they have specialized hybrid components*1 lacking in conventional vehicles, hybrid vehicles generate more CO2 during the materials, body and component manufacturing stages, but they consume approximately half the fuel during operation. Hybrid vehicles have the potential to reduce CO2 emissions by approximately 43%.

<Overview of hybrid system>



*1 Where a conventional vehicle would have only an engine, a hybrid vehicle also has a generator, battery, inverter, motor, decelerator, and drive separation mechanism.

<CO2 emitted by eco-friendly vehicles>



Source: Prepared on the basis of Toyota Motor Corp. materials ***Assumes a driving distance of 100,000 km and Japan's 燃費認証用driving mode.**

(Source: Japan Automobile Manufacturers Association materials)