

**Results of the Fiscal 2011 Follow-up to the Voluntary Action Plan on the
Environment (Summary)
—Section on Global Warming Measures—
< Performance in Fiscal 2010 >**

December 13, 2011
Keidanren

Contents

1. Target achievement policies for the Kyoto Protocol commitment period (fiscal 2008 to fiscal 2012)	1
2. CO₂ emissions in fiscal 2010 by industry as a whole (comprising the industrial and energy-conversion sectors)	1
3. Trends by industry	3
4. Evaluation of Voluntary Action Plan achievements	4
(1) Attribution analysis of CO ₂ emissions in the industrial and energy-conversion sectors for fiscal 2010	4
(2) Setting higher target levels by industries in fiscal 2010	5
5. Efforts in the commercial, residential, and transportation sectors to reduce CO₂ emissions	6
(1) Efforts by participating industries of the transportation, commercial, and other sectors	9
(2) Efforts related to offices and other operational units	9
(3) Efforts related to distribution operations	11
(4) Efforts from a life cycle assessment (LCA) perspective	11
(5) Support for national campaigns and the promotion of forest management activities	16
6. Efforts to make international contributions utilizing the technological capabilities of Japanese industry	18
(1) International comparisons of energy efficiency	18
(2) Overseas operations to reduce greenhouse gases based on the Kyoto Mechanisms	20
7. Future Policies	22
 (Attachment 1)	
Trends in Industrial and Energy-Conversion Sectors	25
 (Attachment 2)	
Trends in Transportation, Commercial, and Other Sectors	31
 (Attachment 3)	
Examples of Efforts to Achieve Targets Reported by Participating Industries	33
 (Attachment 4)	
Results of Efforts Related to Offices and Other Operational Units	47
 (Attachment 5)	
Results of Efforts Related to Distribution Operations	50
 (Attachment 6)	
International Comparison of Energy Efficiency in Participating Industries	52
 (Attachment 7)	
Evaluation Committee for the Voluntary Action Plan on the Environment	54
 (Reference)	
The Formulation of the Voluntary Action Plan on the Environment: History and Aims	55

1. Target achievement policies for the Kyoto Protocol commitment period (fiscal 2008 to fiscal 2012)

Under the philosophy that positive involvement in environmental issues is essential to the survival of companies as well as their activities, Keidanren established the Keidanren Voluntary Action Plan on the Environment (section on global warming measures) in June 1997 prior to adoption of the Kyoto Protocol. Since then, it has declared that it will “endeavor to reduce average CO₂ emissions from the industrial and energy-conversion sectors between fiscal 2008 and 2012 to below the level of fiscal 1990” as the uniform target, while participating industries and companies have set their own targets and have been striving to achieve those targets as their social commitment.

The Voluntary Action Plan on the Environment has recognized the achievement of targets through the supplementary use of domestic credits contributing to material reductions as well as the credits of the Kyoto Mechanisms when the achievement of such targets is difficult through voluntary reduction efforts alone.

2. CO₂ emissions in fiscal 2010 by industry as a whole (comprising the industrial and energy-conversion sectors)

The 34 industries¹ in the industrial and energy-conversion sectors that participated in

1. The following are the 34 participating industry groups in the industrial and energy-conversion sectors: Flat Glass Manufacturers Association of Japan; Japan Federation of Housing Organizations; four electrical/electronics-related groups (Communications and Information Network Association of Japan, Japan Electronics and Information Technology Industries Association, The Japan Electrical Manufacturers' Association, and Japan Business Machine and Information System Industries Association); Japan Sugar Refiners' Association; Flour Millers Association; Japan Petroleum Development Association; Petroleum Association of Japan; Limestone Association of Japan; Lime Manufacture Association; Japan Cement Association; Japan Soft Drink Association; The Federation of Electric Power Companies of Japan; Japan Aluminium Association; Japan Sanitary Equipment Industry Association; Japan Chemical Industry Association; The Japan Gas Association; Japan Federation of Construction Contractors; Japan Mining Industry Association; Japan Machine Tool Builder's Association; The Japan Rubber Manufacturers Association; The Japan Society of Industrial Machinery Manufacturers; Japan Industrial Vehicles Association; Japan Automobile Manufacturers Association; Japan Auto-Body Industries Association; Japan Auto Parts Industries Association; Japan Copper and Brass Association; Japan Paper Association; The Federation of Pharmaceutical Manufacturers' Associations of Japan and Japan Pharmaceutical Manufacturers Association; The Shipbuilders' Association of Japan and the Cooperative Association of Japan Shipbuilders; The Japan Iron and Steel Federation; Japan Association of Rolling Stock Industries; The Japanese Electric Wire & Cable Makers' Association; Japan Dairy Industry Association; The Japan Bearing Industrial Association; and Brewers Association of Japan.

the Fiscal 2011 Follow-up together emitted 505.84 million t-CO₂ in fiscal 1990, the base year.² The emissions accounted for approximately 44% of Japan's total emissions of 1,141.20 million t-CO₂ in that year. Moreover, it represented approximately 83% of the total amount of CO₂ emitted by Japanese industrial and energy-conversion sectors in fiscal 1990 (612.30 million t-CO₂).³

According to the Fiscal 2011 Follow-up, CO₂ emissions in fiscal 2010 were 443.47 million t-CO₂, representing a 12.3% decrease compared to fiscal 1990 (and a 5.3% increase compared to fiscal 2009),⁴ as shown in the graph on following page.⁵

2. When calculating emission volumes for the industrial and energy-conversion sectors as a whole, Keidanren uses the following electricity carbon emission factor survey data (averages for all power sources at generating ends) provided by the Federation of Electric Power Companies. Unless stated otherwise, electricity carbon emission factors cited for individual industries are also based on the following data. (For FY 1990: 3.71; FY 1997: 3.24; FY 1998: 3.13; FY 1999: 3.32; FY 2000: 3.35; FY 2001: 3.36; FY 2002: 3.60; FY 2003: 3.87; FY 2004: 3.74; FY 2005: 3.79; FY 2006: 3.68; FY 2007: 4.07; FY 2008: 3.35 [with credits] / 4.00 [without credits]; FY 2009: 3.16 [with credits] / 3.70 [without credits]; FY 2010: 3.16 [with credits] / 3.72 [without credits]).

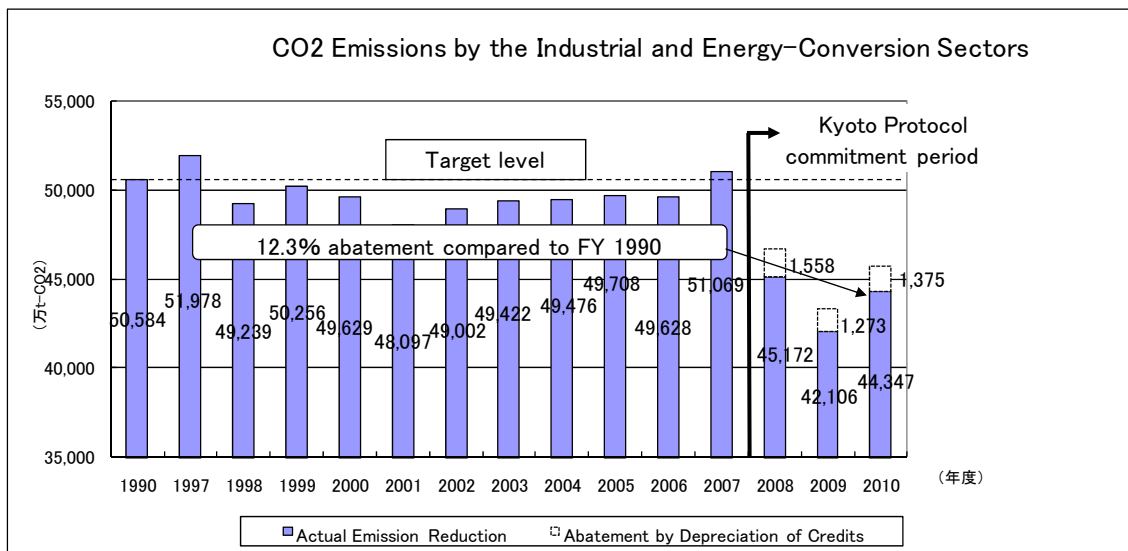
Other conversion factors for energy: For caloric value, Keidanren utilizes data from the following: *Comprehensive Energy Statistics*, the Agency of Natural Resources and Energy's "2005 *nenn iko tekiyo suru hyojun hatsunetsu ryo no kento kekka to kaiteichi ni tsuite*" (Examination results and revised values for standard caloric values applicable in fiscal 2005 and beyond) (May 2007), and survey data by the Federation of Electric Power Companies. Due to revisions of the Caloric Value Table, caloric conversion factors for periods prior to FY 2000 differ from those for the period from FY 2000 through FY 2004 and from FY 2005 onward. For carbon conversion factors, Keidanren uses *National Greenhouse Gas Inventory Report of Japan* (2011).

3. The total of emissions is from the industrial and energy-conversion sectors and industrial processes as contained in the statistics on total CO₂ emissions for Japan, which are announced by the Ministry of the Environment.

4. Without credits, CO₂ emissions were 457.23 million t-CO₂, representing a 9.6% decrease compared to fiscal 1990 (and a 5.4% increase compared to fiscal 2009).

5. Industries review actual figures on CO₂ emissions each year with the aim of improving the accuracy. Therefore, cited figures may vary from the previous fiscal year.

CO₂ Emissions by the Industrial and Energy-Conversion Sectors



3. Trends by industry

Of the 34 industries in the industrial and energy-conversion sectors that participated in the Fiscal 2011 Follow-up, 24 reported CO₂ emission reductions compared to fiscal 1990⁶, while 11 reported reductions compared to fiscal 2009.⁷

Of the 14 industries that defined their goals in terms of CO₂ emission reductions, 13 reported reductions compared to fiscal 1990⁸ and five reported reductions compared to fiscal 2009.^{9, 10} Of the five industries that defined their goals in terms of energy savings, all five reported savings compared to fiscal 1990. Of the 10 industries that defined their goals in terms of CO₂ emission reductions per unit of output, all 10 reported improvements compared to fiscal 1990¹¹, and seven showed improvements compared to fiscal 2009¹². Of the 12 industries that defined their goals in terms of energy efficiency improvements, 10 reported improvements compared to fiscal 1990, and seven showed improvements compared to fiscal 2009 (Attachment 1).

6. Twenty-three industries excluding credits.

7. Twelve industries excluding credits.

8. Achievements made toward each target are counted for those industries that have declared multiple targets.

9. Thirteen industries excluding credits.

10. Six industries excluding credits.

11. Eight industries excluding credits.

12. Six industries excluding credits.

4. Evaluation of Voluntary Action Plan achievements

- (1) Attribution analysis of CO₂ emissions in the industrial and energy-conversion sectors for fiscal 2010

An attribution analysis was made of the 12.3% decrease in CO₂ emissions between fiscal 1990 and fiscal 2010 for the 34 industries in the industrial and energy-conversion sectors. An increase in production activity between fiscal 1990 and fiscal 2010 contributed to a 5.0% rise in CO₂ emissions. On the other hand, reductions in CO₂ emissions per unit of output and the CO₂ emission factor respectively contributed to decreases of 15.8% and 1.5% in CO₂ emissions. The low-carbon rate (the improvement of the CO₂ emission factor compared to fiscal 1990 and the improvement of CO₂ emissions per unit of output compared to fiscal 1990), which reflects industries' efforts to reduce emissions, was -17.3%.

Compared to fiscal 2009, while increases in both production activity and the CO₂ emission factor resulted in an 8.1% rise in CO₂ emissions, decreased CO₂ emissions per unit of output contributed to a 2.7% reduction in CO₂ emissions. As a result, CO₂ emissions in fiscal 2010 represented an increase of 5.3% compared to fiscal 2009.

The reason emissions per unit of output decreased even as production activity fell is the consequence of the steady accumulation of industry efforts in such areas as technological innovation, the installation of energy-saving and high-efficiency facilities, fuel conversion, the recovery and use of waste energy, and improvements in the operation of facilities and equipment (Attachment 3). Voluntary Action Plans are yielding enormous results.

Reference: An Attribution Analysis for Changes in CO₂ Emissions by Industrial and Energy-Conversion Sectors in Fiscal 2010

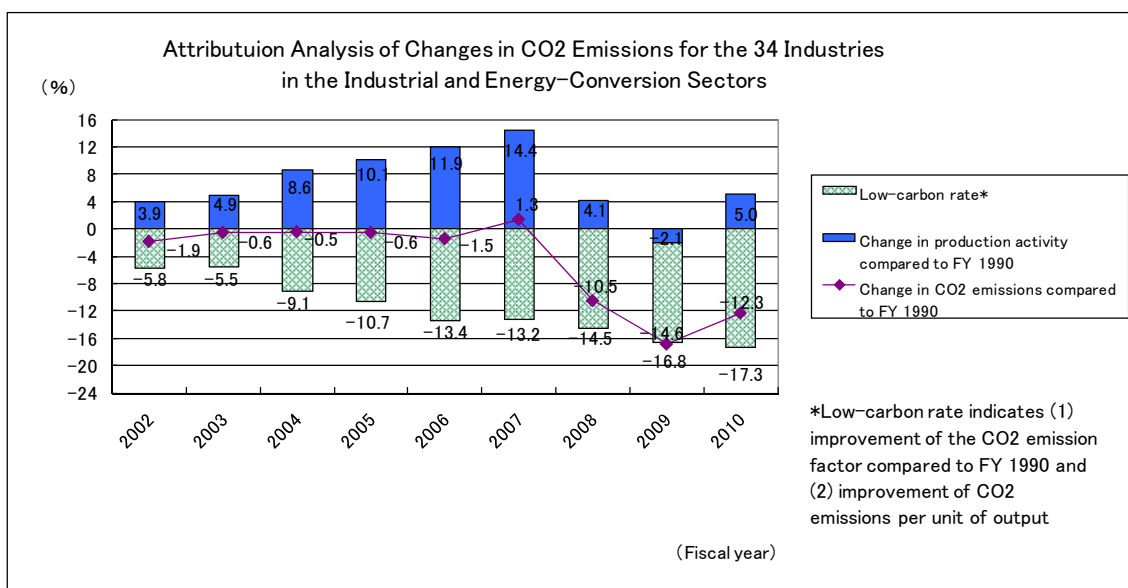
	Comparison to FY 1990	Comparison to FY 2009
Change in production activity* ¹	+5.0%	+8.0%
Change in CO ₂ emission factor* ²	-1.5%	+0.1%
Change in CO ₂ emissions per unit of output (efficiency improvement)	-15.8%	-2.7%
Total	-12.3%	+5.3%

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

*² CO₂/MJ for fuel use and CO₂/kWh for electricity consumption.

Note: The effect of depreciating credits

Emission credits depreciated by the 34 industries in fiscal 2010 to help achieve their targets were about 57.00 million t-CO₂ of Kyoto Mechanism credits (approximately 52.00 million t-CO₂ in fiscal 2009 and 64.00 million t-CO₂ in fiscal 2008) and around 17,000 t-CO₂ of domestic credits, all of which were depreciated by electric power companies. This led to an improvement of the CO₂ emission factor accompanying electricity use. As a result, the CO₂ emissions of the 34 industries were approximately 13.75 million t-CO₂ lower than the case where electric power companies had not depreciated their Kyoto Mechanism credits and domestic credits (corresponding to about 3.1% of fiscal 2010 CO₂ emissions). Industries other than electric power companies depreciated no credits in fiscal 2010.



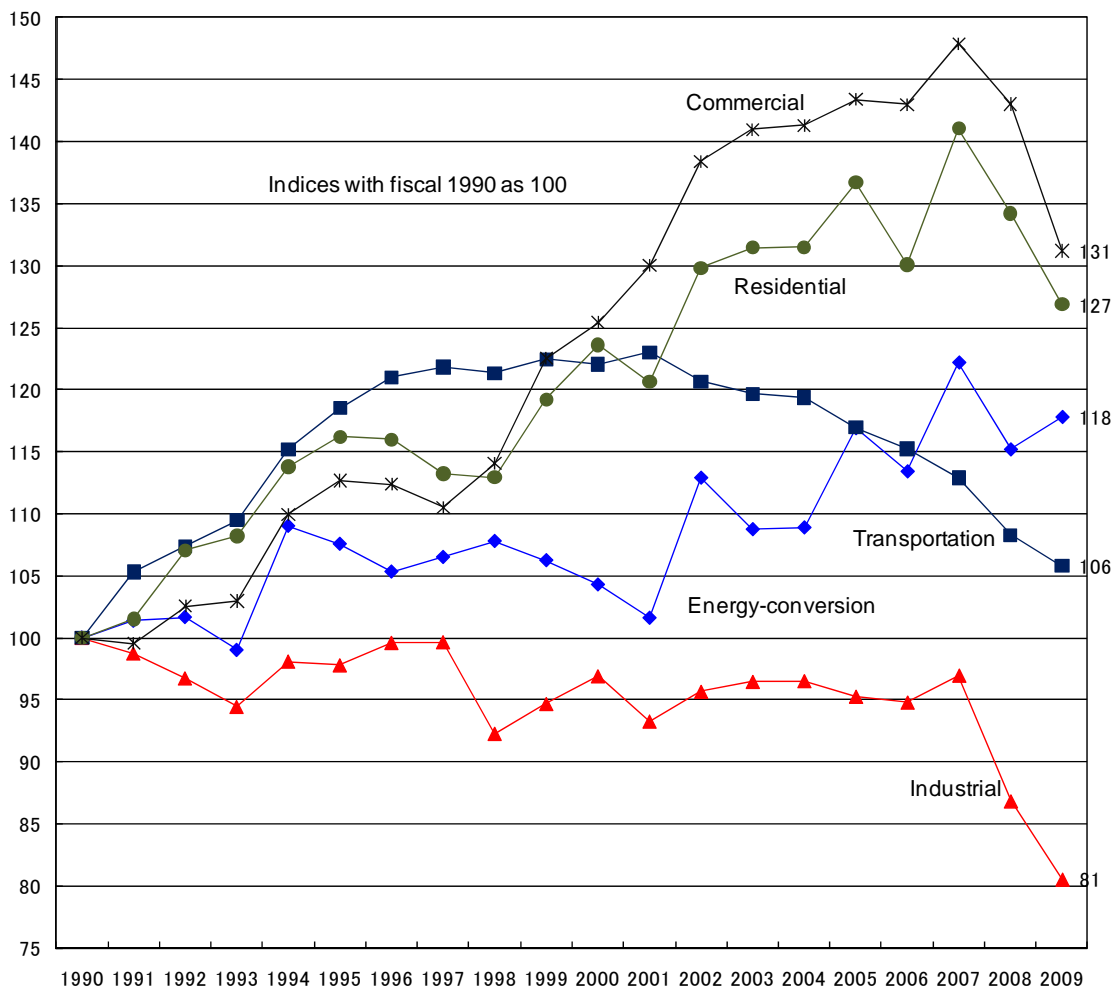
(2) Setting higher target levels by industries in fiscal 2010

In the Voluntary Action Plan on the Environment, industries that have achieved greater reductions than initially forecast are expected to set higher target levels. Many industries set higher target levels in the Fiscal 2007 Follow-up and thereafter, although no industries did so in the Fiscal 2011 Follow-up.

5. Efforts in the commercial, residential, and transportation sectors to reduce CO₂ emissions

An examination of trends of Japan's total CO₂ emissions from energy consumption reveals that, based on final figures for fiscal 2009, such emissions increased 1.5% compared to fiscal 1990 (a decrease of 4.1% for all greenhouse gases including non-energy-consumption CO₂, methane, and alternatives to chlorofluorocarbons [CFCs]). A breakdown of CO₂ emissions by sector shows that emissions from the industrial sector declined 19.5% whereas emissions from the commercial and residential sectors recorded substantial increases of 31.2% and 26.9%, respectively.

Reference: CO₂ Emissions from Energy Consumption in Japan, by Sector

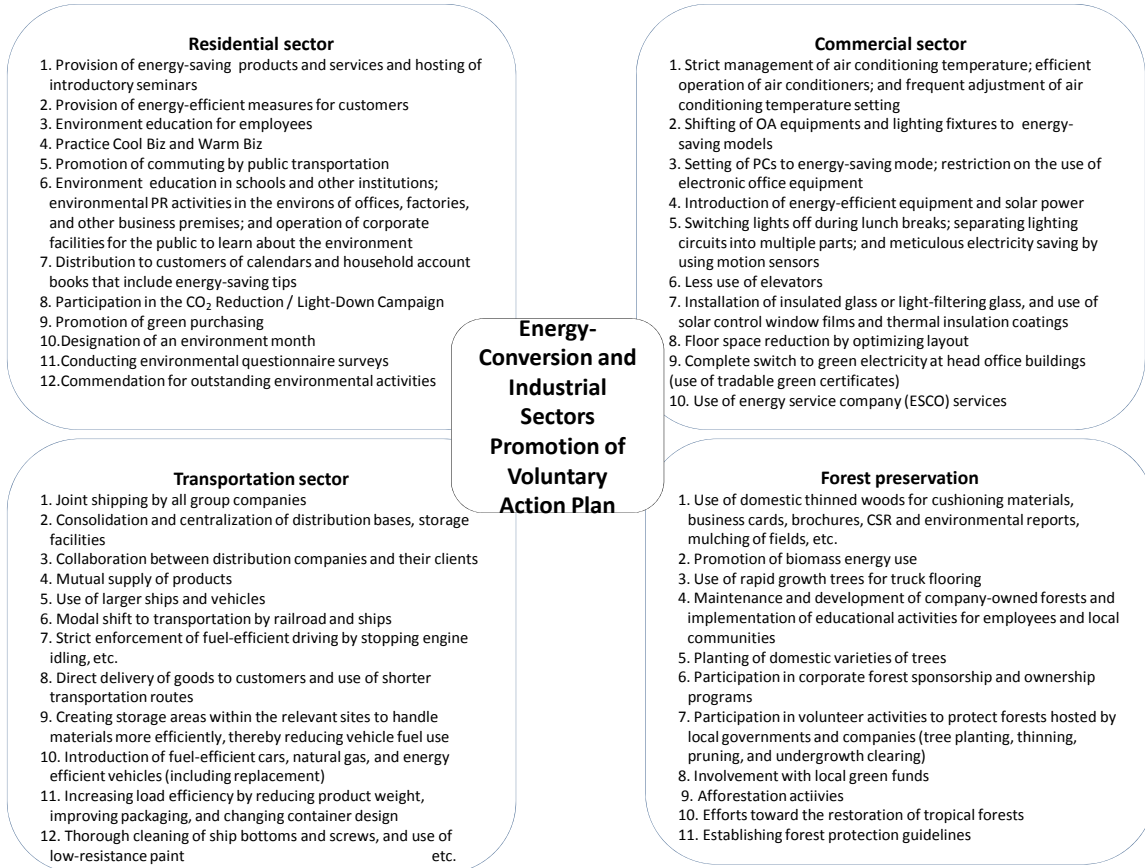


Source: Ministry of the Environment

Japanese industry has supported efforts in the residential, commercial, and transportation sectors to reduce emissions by developing and providing various services and disseminating energy-efficient products that meet “Top Runner” standards and by providing information to employees and customers. Keidanren is determined to continue contributing to Japan’s achievement of its commitments under the Kyoto Protocol by harnessing the technological capabilities and creative ingenuity of Japanese companies.

Industry measures to combat climate change have spread from manufacturing to distribution and office operations and are developing into nationwide efforts through corporate employees. It is important for more companies to expand their activities aimed at preventing climate change by sharing and effectively exploiting the experience and accomplishments of broad-ranged efforts made to date by individual companies to fight climate change. Keidanren has taken every opportunity to urge member companies and organizations to step up their efforts against climate change in the commercial, residential, and transportation sectors. (Examples include the November 20, 2007, statement titled “A Call for Energy-Saving Practices in the Workplace and Other Steps to Strengthen the Fight against Climate Change;” the April 1, 2008, statement, “More Action against Climate Change: On the Start of the Kyoto Protocol Commitment Period;” and the June 1, 2010, statement, “A Call for Efforts to Create a Low-Carbon Society.” All issued in Japanese.)

Reference: Circle of Widening Voluntary Efforts in the Commercial, Residential, Transportation, and Other Sectors



(1) Efforts by participating industries of the transportation, commercial, and other sectors

In the Fiscal 2011 Follow-up 14 industry groups and companies from the commercial and other sectors took part. They were also joined by 13 industrial associations and companies from the transportation sector to formulate their own Voluntary Action Plans (Attachment 2).¹³ Many of the participating industries and companies have set specific quantitative targets for fiscal 2008 through 2012, including targets for CO₂ emissions or CO₂ emissions intensity. They have been making steady efforts toward achieving the targets by pursuing such measures as installation of energy-saving facilities and equipment, operational improvements, and in-house education (Attachment 3).

In the transportation, commercial, and other sectors, many of the participating industries and companies that achieved results surpassing initial expectations have raised their targets, in the same manner as in the industrial and energy-conversion sectors.

(2) Efforts related to offices and other operational units

A variety of energy efficiency improvement measures in offices being pursued is not limited to industry groups in the commercial sector. In a broad range of industry groups in the industrial, energy-conversion, transportation, and other sectors, a diversity of efforts are being made, such as to strengthen the control of air conditioning temperatures, to conserve electricity by switching off lights, and to install high-efficiency, energy-saving facilities. These efforts have led to the reduction of CO₂ emissions and of CO₂ emissions per unit of floor area (Attachment 4).

Also, as shown in the table below, there are multiple companies that have established numerical targets for operational units and are actively promoting measures toward their

13. The following 14 industry groups and companies participated from the commercial and other sectors: The Life Insurance Association of Japan; Japanese Bankers Association; Japan Federation of Printing Industries; Japan LP Gas Association; The General Insurance Association of Japan; Japan Chain Stores Association; Japan Department Stores Association; Japan Franchise Association; Japan Hotel Association; Japan Foreign Trade Council, Inc.; Japan Association of Refrigerated Warehouses; The Real Estate Companies Association of Japan; NTT Group, and KDDI Corporation. Participating industries from the transportation sector consist of the following 13 associations and companies: All Japan Freight Forwarders Association; Japan Trucking Association; The Scheduled Airlines Association of Japan; The Japanese Shipowners' Association; Japan Federation of Coastal Shipping Associations; The Association of Japanese Private Railways; and JR Freight, JR Kyushu, JR Shikoku, JR Central, JR West, JR East, and JR Hokkaido.

achievement.

Reference: Examples of Numerical Targets for Offices and Operational Units Reported by the Industrial and Energy-Conversion Sectors

Industry	Target setting entity	Numerical targets
Petroleum Association of Japan	Companies	<ul style="list-style-type: none"> • Reduce energy consumption intensity by 3% in FY 2012 compared to FY 2009 • Reduce CO₂ emissions by an average of 8% between FY 2010 and FY 2014 compared to the average between FY 2005 and FY 2008
The Japan Gas Association	Companies	<ul style="list-style-type: none"> • Reduce total energy consumption by 13% in FY 2015 and by 15% in FY 2020 compared to FY 2005 • Reduce CO₂ emissions per unit of floor area by more than 1% annually between FY 2008 and FY 2012 compared to FY 2007
The Japan Iron and Steel Federation	Industry	<ul style="list-style-type: none"> • Reduce CO₂ emissions by an average of 5% between FY 2008 and FY 2012 compared to the average between FY 2003 and FY 2005
Japan Chemical Industry Association	Companies	<ul style="list-style-type: none"> • Reduce electricity consumption by 6% in FY 2010 compared to FY 1990
Japan Cement Association	Companies	<ul style="list-style-type: none"> • Reduce annual kerosene consumption by 5% in FY 2012 compared to FY 2005 • Reduce CO₂ emissions from 377 t in FY 2010 to 375 t in FY 2011
Japan Automobile Manufacturers Association and Japan Auto-Body Industries Association	Companies	<ul style="list-style-type: none"> • Reduce CO₂ emissions (per unit of employees) by an average of 2% between FY 2008 and FY 2010 • Reduce CO₂ emissions by 5% in FY 2010 compared to FY 2003

Note: See Attachment 2 for the targets of industries and companies in the commercial sector.

(3) Efforts related to distribution operations

In relation to the emissions reduction in distribution operations, world-leading fuel efficiency technologies targeting motor vehicles are being applied to achieve further improvements. In addition, emissions reduction is steadily progressing through such efforts as consolidating distribution bases, converting to low-emission vehicles, and increasing the efficiency of distribution through collaboration between distribution companies and their clients (Attachment 5).

As shown in the table below, some companies in the industrial, energy-conversion, commercial, and other sectors have established numerical targets for their distribution operations as well.

Reference: Examples of Numerical Targets for Distribution Operations Reported by the Industrial, Energy-Conversion, Commercial, and Other Sectors

Industry	Target setting entity	Numerical targets
The Japan Gas Association	Companies	<ul style="list-style-type: none">• Reduce vehicle CO₂ emissions by more than 5% by the end of FY 2015 compared to FY 2010
Japan Chemical Industry Association	Companies	<ul style="list-style-type: none">• Reduce energy consumption per t/km by 1% per year• Increase the rail transport rate by 1% over the previous year
The Japanese Electric Wire & Cable Makers' Association	Industry	<ul style="list-style-type: none">• Reduce energy consumption intensity by 1% per year
Japan LP Gas Association	Companies	<ul style="list-style-type: none">• Reduce energy consumption intensity by 1% per year

Note: See Attachment 2 for the targets of industries in the transportation sector.

(4) Efforts from a life cycle assessment (LCA) perspective

Companies contribute to CO₂ emissions reduction not only by enhancing efficiency in manufacturing and production processes but also by providing low-carbon products and services. Their ongoing efforts include the development and diffusion of products that

emit less CO₂ in use, and the expanded use of wastes that were considered worthless as raw materials and sources of heat energy.

Reference: Examples of Measures Pursued from an LCA Perspective, Including Contributions Made through Products and Services

Products	Overview		CO ₂ reduction benefits
Appliances	Introduce energy-efficient appliances that exceed standards set by the Top Runner Program		26.00 million t-CO ₂ reduction in commercial and residential sectors in FY 2010 (estimation based on reference materials for the Kyoto Protocol Target Achievement Plan of March 2008)
	Products	Numerical targets for energy efficiency gains	Actual gains (energy efficiency)
	TVs	16.4% (FY 1997→FY 2003)	25.7%
	VCRs	58.7% (FY 1997→FY 2003)	73.6%
	Air conditioners	66.1% (FY1997→FY 2004)	67.8%
	Refrigerators	30.5% (FY 1998→FY 2004)	55.2%
	Freezers	22.9% (FY 1998→FY 2004)	29.6%
High-performance steel	Requires more energy in production process compared to ordinary steel, but offers energy savings when used in machinery such as transformers and heat-resistant boilers.		FY 2010 About 20.39 million t-CO ₂

Carbon fiber	Carbon fiber manufacture involves a high-temperature processing stage that consumes more energy than comparable manufacturing processes for conventional materials. However, when used in automobiles and aircraft, carbon fiber enables weight reductions that in turn facilitate gains in fuel efficiency, thus significantly easing the burden on the environment over the product's life cycle.	At the manufacturing stage, one metric ton of carbon fiber results in the emission of 20 t-CO ₂ but has the benefit of reducing emissions by 70 t- CO ₂ from automobiles and 1,400 t-CO ₂ from aircraft over a 10-year life cycle . If carbon fiber were used in all automobiles (42 million, excluding light motor vehicles) and airplanes (430 owned) in Japan, emissions would be reduced by 22.00 million t-CO ₂ .
Biomass fuel for automobiles	Plant-based bio-ethanol, which is carbon neutral in the Kyoto Protocol, is added to gasoline as bio-ETBE and sold as bio-gasoline.	FY 2010 Reduction of CO ₂ emissions corresponding to 210,000 kl per year (crude oil equivalent)
High-efficiency boilers (Eco Cute)	These water heaters are based on a heat-pump system that uses CO ₂ as a cooling medium and heat recovered from the atmosphere as heat energy.	Cumulative units installed by the end of August 2011: 3.00 million units CO ₂ reductions: about 2.16 million t-CO ₂ per year
Natural gas cogeneration	A high-efficiency system using city gas as fuel to generate electricity and to reuse waste heat.	Cumulative capacity installed by FY 2010 year-end: 4.53 million kW CO ₂ reductions: 12.70 million t-CO ₂ per year (estimation based on reference materials for the Kyoto Protocol Target Achievement Plan of March 2008)

Fuel cells for residential use (Ene-Farm)	Highly efficient system that uses city gas to simultaneously produce electricity and hot water (including that for heating) for household use.	Emissions reduction of 1,500 kg-CO ₂ per year compared to the use of conventional water heaters and electricity generated by thermal power plants
Double-glazed windows	Replacing residential single-pane glass windows with double-glazed ones boosts thermal insulation efficiency and enables some 40% cuts in air-conditioning costs. The percentage of double-glazed glass windows used in relation to total window area is estimated at 87.7% for all newly built single-family housing and 60.7% for all new apartments (FY 2010 figures).	As of FY 2010, double-glazed windows contributed to a reduction of 287,000 t-CO ₂ per year.
In-house production of lightweight soft-drink bottles	Producing a higher percentage of PET bottles in-house cuts emissions attributable to PET bottle delivery and shipping operations. The use of lighter-weight bottles helps reduce emissions that occur at the bottle manufacturing and shipping stages.	Greater in-house production would reduce emissions by about 25,100 t-CO ₂ , which corresponds to emissions of about 225,900 trucks. Weight reductions would reduce emissions by about 1,523 t-CO ₂ compared to 2009 (assuming 1.5 kg of CO ₂ is released per kilogram of PET bottle material consumed).
Concrete pavements	Rolling resistance is 6% to 20% less with concrete pavement compared to asphalt pavement (as of FY 2006). Large vehicles will save 0.8% to 4.8% in fuel costs with concrete pavement compared to asphalt pavement.	If arterial roads (expressways and designated sections of national highways) are fully paved with concrete, emissions will be reduced about 270,000 to 1,610,000 t-CO ₂ per year (average of 940,000 t-CO ₂ per year).

Use of sewage sludge as material for cement	Sewage sludge and other waste products that are difficult to process and are generated in large quantities are being actively used as raw material for cement, and this is contributing to lower energy use in sewage sludge treatment for Japan as a whole.	Using sewage sludge as material for cement has reduced energy consumption by 973×10^6 MJ for Japan as a whole (corresponding to 17.4 MJ/t-cement). This is equivalent to a reduction in emissions of about 70,000 t-CO ₂ .
High-performance grooved copper tubes	Compared to the use of bare tubes, air conditioners with high-performance grooved copper tubes cause CO ₂ emissions to increase 3.3 kg-CO ₂ per unit in the manufacturing process, but emissions from the use of air conditioners can be reduced.	Assuming that air conditioners are in use 4,319 hours per year (JISC 9612) and that they have a life of 10 years, emissions will be reduced about 2,216 kg-CO ₂ per unit compared to bare-tube units even when the difference in CO ₂ emissions during manufacture is factored in.
Electric forklifts	By replacing forklifts with engines with those using electric motors, CO ₂ emissions from the use of forklifts can be greatly reduced.	With the increase in the proportion of electric vehicles in the number of vehicles owned, when CO ₂ emissions from domestic vehicles owned at FY 1998 year-end are keyed to 100, emissions were 87 at FY 2009 year-end and 86 at FY 2010 year-end, a decrease of 14 points compared to FY 1998.
Lightweight paper and cardboard	Reducing the weight of paper and cardboard per unit area (by about 10% compared to conventional products made overseas) has contributed to reducing CO ₂ emissions during	Reducing the weight of paper and cardboard products by about 10% would cut CO ₂ emissions

	shipping.	during cargo shipping by about 0.6%. As of FY 2010, lighter-weight paper and cardboard contributed to a reduction of about 500,000 t-CO ₂ per year in Japan.
Water-saving toilets	Sanitary ware products are used over significantly longer periods of time compared to the time required for production and disposal. The total amount of water flushed during the use phase of these products is enormous. Since the processes of generating water for flushing as well as treating sewage consume energy and emit CO ₂ , reducing the amount of water flushed helps cut CO ₂ emissions.	By replacing a conventional toilet that uses 13 liters per flush with a water-saving toilet that uses 6 liters, CO ₂ emissions can be cut by about 60% (a reduction of 26.7 kg- CO ₂ per year).

(5) Support for national campaigns and the promotion of forest management activities

It is essential that each individual acts day-to-day with a keen awareness of the problem of climate change and adapt his or her lifestyle accordingly. To this end, it will be necessary to change people's attitudes and behavior through national campaigns so that they will use more energy-efficient products and environmentally friendly goods and services. During fiscal 2010, even before the Great East Japan Earthquake struck the nation, many companies actively pursued measures aimed at encouraging national campaigns, including the use of the Internet and the sponsorship of assorted events to provide consumers with more information on energy conservation as well as running environmental education programs for their own employees. The eco-car tax break, the eco-car subsidy, the eco-point program for household electrical appliances, and the housing eco-point program that were introduced in or after the spring of 2009 have helped promote the purchases of automobiles and household electrical appliances with advanced energy-saving performance, as well as encouraging the construction of highly energy-efficient homes and renovations to realize such homes.

Along with strengthened measures to increase the energy efficiency of offices, stores, and other commercial operations and in distribution operations, Keidanren called for strengthened measures that will help expand national campaigns, such as having business leaders set an example by wearing casual summertime dress (“Cool Biz”), promoting the active use of highly energy-efficient equipment, and encouraging employees to keep environmental household account books.¹⁴

Reference: Examples of Environmental Household Account Book Programs Reported by the Industrial and Energy-Conversion Sectors

Industry	Program
The Japan Gas Association	Out of 107 member companies, environmental household account books are being used by about 5,000 employee households.
The Japan Iron and Steel Federation	Energy-saving activities using environmental household account books were started in FY 2005. Member companies have strengthened such efforts as educational activities targeting all employees including group companies and the development of computerized environmental household account books using intranets. As a result, the number of participating households has remained over 20,000 since FY 2008.
Japan Chemical Industry Association	Participating employees of member companies total 9,087.
Japan Paper Association	Between April 2010 and March 2011, electricity, gas, and water usage was checked by stakeholder households to experience the use of environmental household account books and to understand the state of utility use. It was revealed that households were implementing such energy-saving measures as insulation (use of double-glazed windows), installation of high-efficiency water heaters (replacement with Eco-Jozu and Eco-Cute units), replacement of incandescent light bulbs with florescent light bulbs, installation of LEDs, and installation of solar panels.

14. On June 1, 2010, Keidanren Chairman Hiromasa Yonekura issued a statement urging that member companies step up their efforts to prevent climate change by augmenting and achieving the goals of their Voluntary Action Plans on the Environment, participating in Keidanren’s Commitment to a Low Carbon Society, and encouraging clients, employees, and other stakeholders to become more actively involved.

In addition, a number of initiatives to protect forests and CO₂ sinks are being reported. These include the increased use of domestic lumber such as timber from thinning, maintenances of company-owned forests, and the promotion of afforestation projects both in Japan and abroad. As these examples illustrate, industry's efforts against climate change have spread into various sectors (see "Reference: Circle of Widening Voluntary Efforts in the Commercial, Residential, Transportation, and Other Sectors" on page 9). Furthermore, the Japan Paper Association has the target "to increase owned or managed forests to 700,000 ha (an area approximately 11 times the size of Tokyo's 23 wards)" as part of the industry's Voluntary Action Plan targets along with goals for carbon and energy intensity improvements. As of fiscal 2010 year-end, the afforested areas they owned or managed totaled 691,000 ha domestically and overseas.

6. Efforts to make international contributions utilizing the technological capabilities of Japanese industry

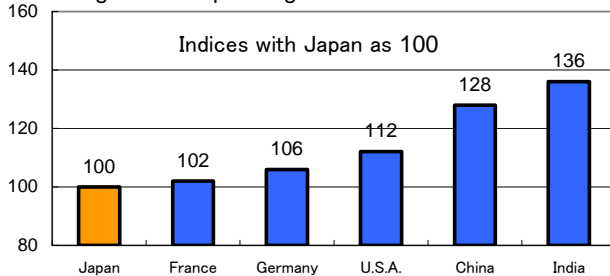
(1) International comparisons of energy efficiency

Japanese industry has been a forerunner in energy-saving by launching efforts in the 1970s following the oil shocks. According to the international comparisons of energy efficiency conducted by participating industries as part of the Fiscal 2010 Follow-up, world-leading levels of energy efficiency have been achieved once again in participating industries that carried out comparisons (see chart on the next page and Attachment 6).

Climate change is a global problem, and it is vital that Japanese companies promote the spread of their advanced energy-saving and alternative energy technologies overseas and contribute to the reduction of greenhouse gas emissions on a global scale.

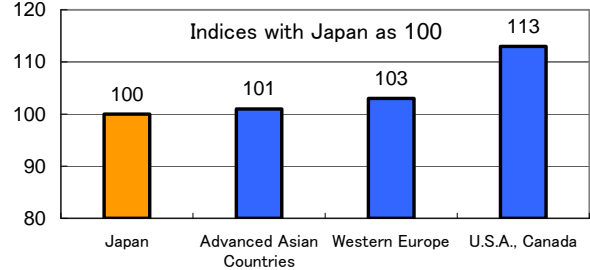
Reference: International Comparisons of Energy Efficiency in Industrial and Energy-Conversion Sectors

Energy required to produce 1kWh of electricity through thermal power generation (2008)



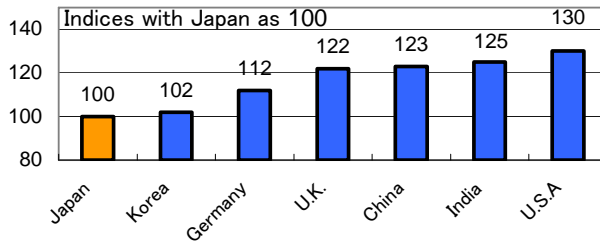
Source: ECOFYS, "International Comparison of Fossil Power Efficiency", 2011.

Energy required to produce 1 kl of oil products (2004)



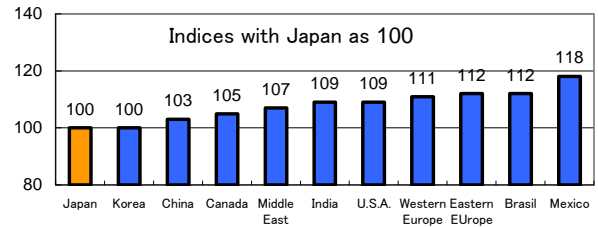
Source: Data from the results of a survey by Solomon Associates Ltd.

Energy required to produce 1 ton of iron (2005)



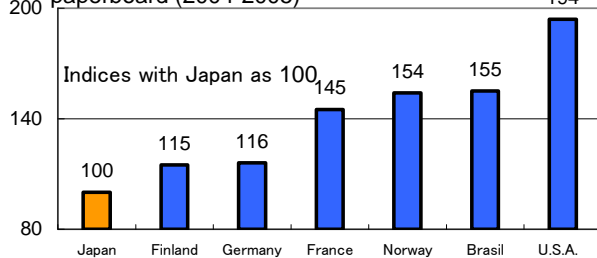
Source: Research Institute for Innovative Technology for the Earth, "International Comparison of Energy Efficiency (Power Generation, Steel, and Cement)", October 2009. Japan Iron and Steel Federation indexed the

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



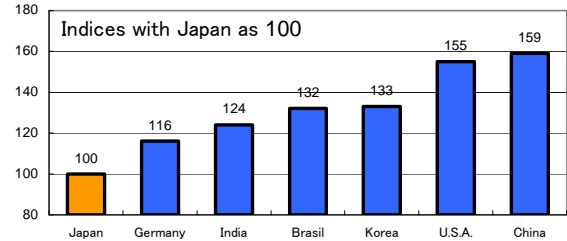
Source: CMAI "Capacity Database" (2009) and Japan Soda Industry Association, Soda Handobukku (Soda Handbook) (2009)

Energy required to produce 1 ton of paper or paperboard (2004-2005)



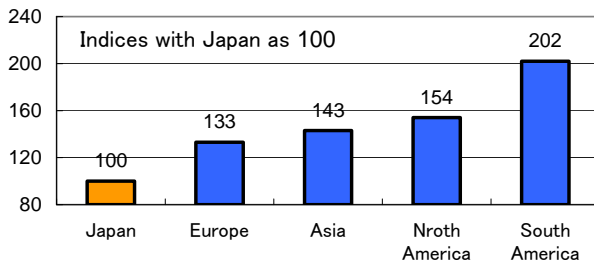
Source: Institute of Energy Economics, Japan, "Research Paper for Technological Measures of Manufacturers in 2007: The Production and Energy Consumption of Pulp, Paper, and Paperboard Industries of Countries", 2007.

Energy required to produce 1 ton of cement clinker (in-process material) (2003)



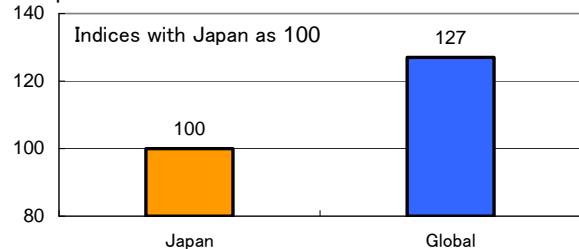
Source: The International Energy Agency (IEA), "Worldwide Trends in Energy Use and Efficiency 2008".

Energy required to refine copper (2000)



Source: Sample data collected through interviews by Japan Mining Industry Association.

Energy required in the aluminum plate rolling process (2000)



Source: International Aluminium Institute and Life Cycle Assessment Society of Japan's Database (2006).

(2) Overseas operations to reduce greenhouse gases based on the Kyoto Mechanisms

In the Fiscal 2011 Follow-up, as was seen in the preceding year, many specific operations including alternative energy projects, waste heat recovery, and methane gas recovery in various regions of the world were reported along with the number of carbon credits expected to be generated from such Kyoto Mechanisms-based projects. Furthermore, many industrial associations and corporations have made financial contributions to domestic and international funds such as the Japan GHG Reduction Fund and the World Bank.

When the achievement of the targets is difficult by industry's reduction efforts alone, under the Voluntary Action Plan on the Environment, the industry may utilize supplementary means of the Kyoto Mechanisms such as credits from the Clean Development Mechanism (CDM) and Joint Implementation (JI) to achieve their targets.

As shown in the table below, some industry groups have made massive financial contributions to acquire credits through the Kyoto Mechanisms in order to meet their voluntary targets, despite having already achieved world-leading levels of energy efficiency.

Reference: Examples of Projects Reported by Participating Industries Aimed at Making International Contributions Utilizing the Kyoto Mechanisms

Industry	Project outline	Credits earned/retired
The Federation of Electric Power Companies of Japan	<ul style="list-style-type: none"> • Expanding overseas projects within the framework of the Kyoto Protocol's JI or CDM, such as biomass power generation, heat efficiency improvement, and afforestation. • Financial contributions to various funds, including the World Bank carbon funds and the Japan Greenhouse Gas Reduction Fund, in which industries in Japan are participating as a concerted effort 	<ul style="list-style-type: none"> • Credits of about 64.00 million t-CO₂, 52.00 million t-CO₂, and 57.00 million t-CO₂ were respectively retired in FY 2008, FY 2009, and FY 2010.
The Japan Iron and Steel Federation	<ul style="list-style-type: none"> • Shandong Dongyue HFC23 decomposition project in China • Installation of waste heat recovery system at 	<ul style="list-style-type: none"> • For the industry overall, 35.00 million t-CO₂

	<p>Qian'an coke plant in China</p> <ul style="list-style-type: none"> • Electric power generation project using the waste heat of sinter cooling systems in the Philippines • Participation in various carbon funds 	
Petroleum Association of Japan	<ul style="list-style-type: none"> • Operations in Vietnam to capture and utilize gas released during oil drilling • Operations in Brazil to capture methane gas from landfill disposal sites • Participation in various carbon funds 	<ul style="list-style-type: none"> • 0.68 million t-CO₂ per year • 0.66 million t-CO₂ per year
Japan Petroleum Development Association	<ul style="list-style-type: none"> • Project in China's Zhejiang Province to recover and decompose HFC23 gas generated as a byproduct during alternative CFC production 	<ul style="list-style-type: none"> • About 25.00 million t-CO₂
Japan Federation of Construction Contractors	<ul style="list-style-type: none"> • Promotion mainly by major companies of CDM projects in developing countries, such as those for capturing methane gas at waste disposal sites and for power generation 	—
The Federation of Pharmaceutical Manufacturers' Associations of Japan and Japan Pharmaceutical Manufacturers Association	<ul style="list-style-type: none"> • Participation in various carbon funds 	<ul style="list-style-type: none"> • About 8,168 t-CO₂ (held as of FY 2010 year-end)

Note: The above also includes efforts by individual companies.

7. Future Policies

The Kyoto Protocol Target Achievement Plan that the government revised in March 2008 refers to the advantages of the Voluntary Action Plan on the Environment. It states that “it enables each entity to use its originality and ingenuity to select outstanding countermeasures, afford incentives for higher level of targets, and involve no procedural costs either for the government or for implementing entities. We expect that these advantages will be further enhanced in Voluntary Action Plans by businesses.” In the Kyoto Protocol Target Achievement Plan, the Voluntary Action Plan on the Environment is recognized for an instrumental role in facilitating the industrial sectors’ efforts toward the achievement of targets.

Impacts of the March 2011 Great East Japan Earthquake on the Voluntary Action Plan on the Environment are still unclear. Keidanren will, however, continue urging that all participating industries and companies, including those in the commercial, transportation, and other sectors, remain committed to individual efforts to achieve their goals, as well as working toward achieving the uniform target, namely, “to endeavor to reduce average CO₂ emissions from the industrial and energy-conversion sectors between fiscal 2008 and 2012 to below the level of fiscal 1990.”

The business community will also continue to pursue the following specific initiatives: (1) development and diffusion of energy-efficient products and services; (2) establishment of numerical targets and the raising of target levels for energy-efficient activities at head offices and other office buildings of individual companies, (3) sharing of outstanding CO₂ emissions reduction schemes within the commercial and transportation sectors; (4) improvements in distribution efficiency through cross-industry collaborations, including coordination between distributors and their clients; (5) support for energy-efficiency activities at employees’ households; (6) contribution to environmental education; and (7) the promotion of forest improvement activities. Furthermore, through the use of the domestic credit system, the business community will support the environmental measures taken by small- and medium-sized companies and other entities.

To enhance the transparency and credibility of the Voluntary Action Plan on the Environment, in fiscal 2002 Keidanren established the Evaluation Committee for the Voluntary Action Plan on the Environment consisting of outside experts. This

committee (1) ensures that the data reported by participating industries are aggregated appropriately, and (2) evaluates the overall Follow-up system from the perspective of enhancing its transparency and credibility (Attachment 7). The Evaluation Committee's reports are published on the Keidanren website. Acting in response to points made by the Evaluation Committee, in the Fiscal 2011 Follow-up, Keidanren endeavored to explain the progress made in achieving overall targets, to explain how the use of low-carbon products helps to reduce CO₂ emissions, and to specify the CO₂ emissions reductions achieved by individual industries as well as the supplementary CO₂ emissions reductions achieved through the retirement of credits. Keidanren will continue its efforts to enhance its Voluntary Action Plan, including addressing issues brought up by the Evaluation Committee

Climate change is a problem that must be addressed on a global scale, and long-term efforts will be essential to solve it. Regarding a post-2012 international framework on climate change, Keidanren published its policy proposal on September 15, 2011, calling for the establishment of a single international framework that is equitable and effective and involves responsible participation by all major emitters. Keidanren intends to lobby the governments of Japan and other countries in cooperation with economic organizations abroad.

Keidanren believes that a Bilateral Offset Mechanism will be effective in complementing the CDM. Under this mechanism, energy-saving and low-carbon projects would be formulated through bilateral discussions between a sponsoring country and a developing country, fully taking the latter's needs into consideration. Part of the emissions reductions resulting from the transfer of technologies to the developing country would be recognized as the sponsoring country's contribution. Keidanren will continue calling for an early realization of the mechanism.

As an independent initiative under the post-2012 framework, Keidanren's Commitment to a Low Carbon Society was announced in December 2009, which set out a vision for the Japanese business community to harness its technological prowess and assume an instrumental role in realizing a low-carbon society that achieves economic growth in harmony with the environment. This commitment consists of the four pillars of (1) maximizing the introduction of best available low-carbon technologies in corporate activities, (2) developing and commercializing products and services that harness world-leading energy-saving technologies for consumers, (3) transferring technology

and expertise to other countries, and (4) developing innovative technologies. Responding to this commitment, many industries have already announced or are proceeding to determine action plans.

In the interest of battling climate change through the remaining commitment period under the Kyoto Protocol and beyond, Keidanren will continue to aim for the highest levels of energy efficiency in the world and take the initiative in developing and promoting the adoption of existing energy-efficient technologies in Japan and abroad and encouraging the development of innovative new technologies.

Trends in Industrial and Energy-Conversion Sectors

(10,000t-CO₂; 10,000kl, crude oil equivalents)

Industry	(☆ : target defined by the industry)	target level	FY1990	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	Compared to FY 1990(%)	Compared to FY 2009(%)	
Federation of Electric Power Companies	CO ₂ emissions (with credits)														33,200	30,100	31,700	+15.3%	+5.3%	
	CO ₂ emissions (excluding credits)		27,500	29,000	28,300	30,400	31,500	31,000	34,000	36,100	36,200	37,300	36,500	41,700	39,500	35,300	37,400	+36.0%	+5.9%	
	CO ₂ emissions intensity (with credits)														0.89	0.84	0.84			
	CO ₂ emissions intensity (excluding credits) ☆		-20%	1	0.88	0.85	0.89	0.90	0.90	0.97	1.04	1.00	1.01	0.98	1.09	1.06	0.99	0.99		
	Energy consumption			10,800	11,200	10,900	11,700	12,000	11,700	12,700	13,500	13,300	13,600	13,500	15,500	14,600	13,200	13,600	+25.9%	+3.0%
	Energy consumption intensity			1	0.97	0.97	0.96	0.95	0.95	0.94	0.94	0.95	0.95	0.94	0.94	0.93	0.93	0.92		
	Production activity index			1	1.20	1.21	1.24	1.27	1.25	1.28	1.27	1.31	1.34	1.35	1.40	1.35	1.30	1.37		
	Portion attributed to power industry: figures are used in the 34-industries	CO ₂ emissions (with credits)														3,330	3,030	3,100	+1.0%	+2.3%
		CO ₂ emissions (excluding credits)		3,070	3,350	3,220	3,340	3,410	3,340	3,700	3,860	3,830	3,850	3,700	4,250	3,960	3,560	3,650	+18.9%	+2.5%
		Energy consumption		1,210	1,300	1,240	1,280	1,300	1,260	1,380	1,440	1,410	1,410	1,370	1,580	1,470	1,330	1,320	+9.1%	-0.8%
Petroleum Association of Japan	CO ₂ emissions (with credits)														4,036	3,922	3,963	+28.1%	+1.1%	
	CO ₂ emissions (excluding credits)		3,094	4,105	4,062	4,093	4,053	4,047	4,016	4,058	4,037	4,133	4,059	4,164	4,053	3,936	3,978	+28.6%	+1.1%	
	CO ₂ emissions intensity (with credits)			1	0.92	0.93	0.90	0.89	0.89	0.88	0.88	0.87	0.85	0.85	0.85	0.86	0.85	0.84		
	CO ₂ emissions intensity (excluding credits)			1	0.92	0.93	0.90	0.89	0.89	0.88	0.88	0.87	0.85	0.85	0.85	0.86	0.85	0.84		
	Energy consumption		1,287	1,705	1,670	1,675	1,661	1,657	1,650	1,665	1,665	1,714	1,682	1,725	1,688	1,633	1,651	+28.3%	+1.1%	
	Energy consumption intensity ☆		-13%	1	0.92	0.92	0.89	0.87	0.87	0.87	0.87	0.86	0.84	0.85	0.85	0.86	0.84	0.84		
Production activity index			1	1.44	1.42	1.46	1.48	1.48	1.47	1.49	1.50	1.58	1.55	1.58	1.53	1.50	1.52			
Japan Gas Association	CO ₂ emissions (with credits)*5														34	31	31	-77.0%	-1.6%	
	CO ₂ emissions (excluding credits)*5		133	107	96	92	83	72	66	58	53	46	38	40	37	34	33	-74.9%	-1.3%	
	CO ₂ emissions intensity (with credits)*5			1	0.56	0.49	0.45	0.39	0.33	0.28	0.24	0.21	0.17	0.13	0.13	0.12	0.11	0.11		
	CO ₂ emissions intensity (excluding credits)*5			1	0.56	0.49	0.45	0.39	0.33	0.28	0.24	0.21	0.17	0.13	0.13	0.12	0.11	0.11		
	Energy consumption		66.5	55.3	50.6	48.1	43.9	38.5	34.8	29.8	28.1	24.8	21.1	21.3	20.1	19.2	19.0	-71.4%	-1.4%	
	Energy consumption intensity			1	0.58	0.52	0.47	0.41	0.36	0.30	0.25	0.22	0.18	0.14	0.14	0.13	0.13	0.12		
Production activity index			1	1.43	1.46	1.54	1.60	1.62	1.76	1.82	1.94	2.10	2.20	2.33	2.25	2.21	2.33			
Japan Iron and Steel Federation	CO ₂ emissions (with credits)														17,618	16,543	18,603	-7.3%	+12.5%	
	CO ₂ emissions (excluding credits)		20,061	19,799	18,643	19,233	18,363	17,894	18,387	18,601	18,791	18,704	19,015	19,715	17,813	16,688	18,785	-6.4%	+12.6%	
	CO ₂ emissions intensity (with credits)			1	1.09	1.15	1.10	0.95	0.96	0.92	0.92	0.91	0.90	0.88	0.88	0.92	0.93	0.91		
	CO ₂ emissions intensity (excluding credits)			1	1.09	1.15	1.10	0.95	0.96	0.92	0.92	0.91	0.90	0.88	0.88	0.92	0.93	0.91		
	Energy consumption ☆		-10%	6,288	6,240	5,871	6,022	5,761	5,582	5,716	5,775	5,861	5,837	5,964	6,138	5,568	5,207	5,869	-6.7%	+12.7%
	Energy consumption intensity			1	1.09	1.16	1.10	0.95	0.95	0.91	0.91	0.90	0.90	0.88	0.87	0.91	0.93	0.91		
Production activity index			1	0.91	0.81	0.87	0.96	0.93	1.00	1.01	1.03	1.03	1.08	1.12	0.97	0.90	1.03			
Japan Chemical Industry Association	CO ₂ emissions (with credits)														6,033	5,891	6,020	-6.1%	+2.2%	
	CO ₂ emissions (excluding credits)		6,407	6,999	6,721	6,982	6,978	6,643	6,772	6,834	6,911	6,902	6,854	6,851	6,220	6,047	6,194	-3.3%	+2.4%	
	CO ₂ emissions intensity (with credits)			1	0.92	0.92	0.91	0.91	0.92	0.91	0.90	0.88	0.87	0.84	0.83	0.87	0.82	0.79		
	CO ₂ emissions intensity (excluding credits)			1	0.92	0.92	0.91	0.91	0.92	0.91	0.90	0.88	0.87	0.84	0.83	0.87	0.82	0.79		
	Energy consumption		2,677	2,995	2,877	2,969	2,917	2,777	2,809	2,812	2,872	2,875	2,886	2,904	2,643	2,627	2,726	+1.8%	+3.8%	
	Energy consumption intensity ☆		-20%	1	0.94	0.94	0.92	0.91	0.92	0.90	0.88	0.88	0.86	0.84	0.84	0.88	0.85	0.83		
Production activity index			1	1.19	1.14	1.20	1.19	1.13	1.16	1.19	1.23	1.24	1.28	1.29	1.12	1.15	1.23			
Japan Paper Association	CO ₂ emissions (with credits)														2,076	1,914	1,841	-27.5%	-3.8%	
	CO ₂ emissions (excluding credits)		2,538	2,595	2,599	2,639	2,719	2,620	2,639	2,628	2,572	2,451	2,312	2,304	2,118	1,946	1,875	-26.1%	-3.6%	
	CO ₂ emissions intensity (with credits)			1	0.96	0.99	0.96	0.97	0.99	0.97	0.97	0.95	0.89	0.84	0.83	0.83	0.82	0.77		
	CO ₂ emissions intensity (excluding credits) ☆		-16%	1	0.96	0.99	0.96	0.97	0.99	0.97	0.97	0.95	0.89	0.84	0.83	0.83	0.82	0.77		
	Energy consumption		943	951	950	961	977	933	937	925	905	869	829	823	753	689	671	-28.8%	-2.7%	
	Energy consumption intensity ☆		-20%	1	0.95	0.97	0.94	0.94	0.95	0.93	0.92	0.90	0.85	0.81	0.79	0.79	0.78	0.75		
Production activity index			1	1.06	1.04	1.08	1.11	1.04	1.07	1.06	1.07	1.08	1.08	1.10	1.01	0.94	0.95			

Industry	(☆ : target defined by the industry)	target level	FY1990	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	Compared to FY 1990(%)	Compared to FY 2009(%)	
Cement Association of Japan	CO2 emissions (with credits)														1,944	1,736	1,643	-40.1%	-5.4%	
	CO2 emissions (excluding credits)		2,741	2,681	2,480	2,464	2,473	2,376	2,249	2,186	2,107	2,177	2,184	2,107	1,959	1,747	1,654	-39.7%	-5.4%	
	CO2 emissions intensity (with credits)														1.00	1.01	1.00			
	CO2 emissions intensity (excluding credits)		1	0.98	1.02	1.02	1.02	1.02	1.01	1.01	1.00	1.00	1.02	1.02	1.01	1.02	1.00			
	Energy consumption		861	823	756	747	745	715	674	652	630	651	656	628	584	521	495	-42.6%	-5.1%	
	Energy consumption intensity	☆	-3.8%	1	0.96	0.99	0.98	0.98	0.98	0.97	0.96	0.95	0.95	0.97	0.96	0.96	0.97	0.96		
	Production activity index			1	0.99	0.89	0.88	0.88	0.85	0.81	0.79	0.77	0.79	0.78	0.76	0.71	0.63	0.60		
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	CO2 emissions (with credits)														1,625	1,468	1,449	+30.3%	-1.3%	
	CO2 emissions (excluding credits)		1,112	1,302	1,247	1,307	1,382	1,328	1,453	1,699	1,730	1,804	1,843	2,109	1,865	1,666	1,652	+48.6%	-0.9%	
	CO2 emissions intensity (with credits)	☆	-35%												0.56	0.57	0.53			
	CO2 emissions intensity (excluding credits)		1	0.78	0.76	0.76	0.71	0.70	0.71	0.76	0.71	0.69	0.66	0.67	0.64	0.65	0.60			
	Energy consumption		638	832	799	803	849	817	838	933	978	1,010	1,065	1,136	1,028	980	974	+52.6%	-0.7%	
	Energy consumption intensity		1	0.87	0.85	0.82	0.76	0.75	0.72	0.72	0.70	0.67	0.66	0.63	0.62	0.66	0.62			
	Production activity index			1	1.50	1.48	1.54	1.75	1.70	1.83	2.02	2.20	2.35	2.52	2.83	2.62	2.31	2.46		
Japan Federation of Construction Contractors	CO2 emissions (with credits)														495	442	375	-59.3%	-15.2%	
	CO2 emissions (excluding credits)		923	892	876	718	704	659	642	514	492	518	490	512	509	454	387	-58.0%	-14.7%	
	CO2 emissions intensity (with credits)	☆	-13%												0.85	0.87	0.85			
	CO2 emissions intensity (excluding credits)		1	0.97	0.95	0.94	0.90	0.92	0.97	0.90	0.86	0.87	0.81	0.87	0.88	0.89	0.88			
	Energy consumption		429	416	409	336	324	301	286	229	225	222	215	209	208	189	164	-61.7%	-13.0%	
	Energy consumption intensity		1	0.97	0.95	0.95	0.89	0.90	0.93	0.86	0.85	0.80	0.77	0.76	0.77	0.79	0.80			
	Production activity index			1	1.00	1.00	0.82	0.85	0.78	0.72	0.62	0.62	0.64	0.65	0.64	0.63	0.55	0.48		
Japan Automobile Manufacturers Association Japan Auto-body Industries Association	CO2 emissions (with credits)	☆	-25%												508	451	467	-44.6%	+3.7%	
	CO2 emissions (excluding credits)		844	724	684	682	680	643	674	679	672	682	660	657	553	486	505	-40.1%	+3.9%	
	CO2 emissions intensity (with credits)														0.56	0.59	0.58			
	CO2 emissions intensity (excluding credits)		1	0.91	0.94	0.96	0.90	0.83	0.79	0.80	0.76	0.72	0.64	0.60	0.61	0.64	0.63			
	Energy consumption		435	400	381	367	354	336	339	333	337	343	338	337	289	265	275	-36.8%	+3.7%	
	Energy consumption intensity		1	0.98	1.01	1.00	0.91	0.84	0.77	0.76	0.74	0.70	0.64	0.59	0.62	0.68	0.66			
	Production activity index			1	0.94	0.87	0.85	0.89	0.92	1.01	1.01	1.04	1.13	1.21	1.30	1.08	0.90	0.96		
Japan Auto Parts Industries Association	CO2 emissions (with credits)	☆	-7%												531	463	504	-29.5%	+8.8%	
	CO2 emissions (excluding credits)		715	688	645	650	637	578	626	644	654	695	682	735	590	510	557	-22.1%	+9.2%	
	CO2 emissions intensity (with credits)	☆	-20%												0.57	0.53	0.53			
	CO2 emissions intensity (excluding credits)		1	0.92	0.92	0.91	0.86	0.81	0.82	0.82	0.80	0.78	0.71	0.68	0.63	0.59	0.59			
	Energy consumption		375	406	390	381	361	329	340	335	348	362	366	375	308	282	307	-18.1%	+9.2%	
	Energy consumption intensity		1	1.03	1.06	1.02	0.93	0.88	0.85	0.81	0.81	0.78	0.72	0.66	0.63	0.62	0.62			
	Production activity index			1	1.05	0.98	1.00	1.03	0.99	1.07	1.10	1.15	1.24	1.35	1.51	1.31	1.22	1.32		
Japan Federation of Housing Organization	CO2 emissions (with credits)	☆	-20%												368	259	272	-47.6%	+5.0%	
	CO2 emissions (excluding credits)		519	549	507	517	506	494	472	442	427	409	415	373	368	259	272	-47.6%	+5.0%	
	CO2 emissions intensity (with credits)														1.10	0.99	0.95			
	CO2 emissions intensity (excluding credits)		1	1.15	1.18	1.12	1.11	1.18	1.18	1.09	1.05	0.99	0.99	1.09	1.10	0.99	0.95			
	Energy consumption		197	209	193	169	164	164	182	170	164	157	160	143	142	100	105	-46.9%	+5.0%	
	Energy consumption intensity		1	1.15	1.18	0.96	0.95	1.03	1.20	1.11	1.06	1.01	1.00	1.11	1.12	1.00	0.97			
	Production activity index			1	0.92	0.83	0.89	0.87	0.81	0.77	0.78	0.78	0.79	0.81	0.66	0.64	0.50	0.55		

Industry	(☆ : target defined by the industry)	target level	FY1990	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	Compared to FY 1990(%)	Compared to FY 2009(%)	
Japan Mining Industry Association	CO2 emissions (with credits)															433	426	438	+2.8%	
	CO2 emissions (excluding credits)		486	483	481	494	505	503	502	516	510	497	482	491	463	452	466	-4.3%	+3.1%	
	CO2 emissions intensity (with credits)																0.80	0.79	0.79	
	CO2 emissions intensity (excluding credits)		1	0.92	0.93	0.91	0.88	0.89	0.90	0.91	0.92	0.89	0.83	0.85	0.86	0.84	0.84			
	Energy consumption		205	210	213	219	220	217	215	215	216	208	206	205	196	197	205	-0.3%	+3.7%	
	Energy consumption intensity	☆	-12%	1	0.95	0.97	0.95	0.91	0.91	0.91	0.90	0.92	0.88	0.84	0.83	0.86	0.87	0.87		
	Production activity index			1	1.08	1.07	1.12	1.18	1.16	1.15	1.16	1.14	1.15	1.19	1.19	1.11	1.11	1.14		
Lime Manufacture Association	CO2 emissions (with credits) ☆	-10%														272	239	263	-25.8%	
	CO2 emissions (excluding credits)		354	310	272	293	302	275	292	299	300	306	312	327	276	242	266	-24.9%	+9.9%	
	CO2 emissions intensity (with credits)																0.80	0.77	0.75	
	CO2 emissions intensity (excluding credits)		1	0.94	0.90	0.92	0.93	0.91	0.92	0.90	0.87	0.86	0.86	0.86	0.81	0.78	0.76			
	Energy consumption ☆	-10%	121.8	108.2	95.9	103.0	104.7	95.4	99.9	100.8	101.3	104.5	107.0	112.0	96.5	86.4	94.5	-22.4%	+9.4%	
	Energy consumption intensity		1	0.95	0.92	0.94	0.94	0.92	0.91	0.88	0.85	0.86	0.86	0.85	0.82	0.81	0.79			
	Production activity index			1	0.93	0.86	0.90	0.91	0.86	0.90	0.94	0.98	1.00	1.03	1.08	0.96	0.88	0.99		
The Japan Rubber Manufacturers Association	CO2 emissions (with credits)*5															188	171	180	-10.5%	
	CO2 emissions (excluding credits)*5		201	192	189	195	192	185	196	211	217	223	215	220	201	181	191	-5.1%	+5.7%	
	CO2 emissions intensity (with credits)																0.69	0.71	0.65	
	CO2 emissions intensity (excluding credits)		1	0.90	0.88	0.92	0.85	0.85	0.86	0.88	0.86	0.82	0.74	0.77	0.78	0.78	0.73			
	Energy consumption		98.8	99.8	99.5	100.7	97.0	94.0	97.1	100.9	104.5	106.9	106.4	107.2	100.0	93.3	99.4	+0.6%	+6.5%	
	Energy consumption intensity		1	1.00	1.01	1.03	0.92	0.93	0.91	0.90	0.91	0.90	0.88	0.88	0.90	0.97	0.91			
	Production activity index			1	1.01	1.00	0.99	1.06	1.02	1.09	1.14	1.17	1.21	1.23	1.23	1.12	0.97	1.11		
The Federation of Pharmaceutical Manufacturers' Association of Japan Japan Pharmaceutical Manufacturers Association	CO2 emissions (with credits) ☆	±0%														168	154	154	+1.4%	
	CO2 emissions (excluding credits)		151	172	173	189	189	186	191	198	204	201	194	196	182	166	166	+9.4%	-0.1%	
	CO2 emissions intensity (with credits)																0.66	0.57	0.56	
	CO2 emissions intensity (excluding credits)		1	0.90	0.91	0.94	0.91	0.86	0.86	0.87	0.87	0.83	0.79	0.78	0.71	0.62	0.60			
	Energy consumption		71.4	88.2	90.2	95	93	93	94	95	99	97	96	96	92	89	90	+25.4%	+0.9%	
	Energy consumption intensity		1	0.98	1.01	1.01	0.95	0.91	0.89	0.89	0.89	0.85	0.83	0.80	0.76	0.70	0.69			
	Production activity index			1	1.26	1.25	1.33	1.38	1.43	1.47	1.50	1.56	1.60	1.62	1.67	1.69	1.78	1.82		
Flat Glass Association	CO2 emissions (with credits) ☆	-22%														119	106	111	-37.6%	
	CO2 emissions (excluding credits)		178	163	145	138	134	137	132	134	134	133	136	130	122	108	114	-36.2%	+5.0%	
	CO2 emissions intensity (with credits)																1.13	1.12	1.01	
	CO2 emissions intensity (excluding credits)		1	1.15	1.17	1.09	1.10	1.11	1.11	0.97	0.98	1.03	1.03	1.09	1.15	1.15	1.03			
	Energy consumption ☆	-21%	71.4	65.0	58.8	55.4	53.8	55.1	52.3	52.2	52.2	51.7	53.5	50.5	48.2	43.2	45.5	-36.3%	+5.3%	
	Energy consumption intensity		1	1.14	1.18	1.10	1.09	1.11	1.10	0.95	0.95	1.00	1.01	1.06	1.13	1.14	1.03			
	Production activity index			1	0.80	0.70	0.71	0.69	0.69	0.67	0.77	0.77	0.72	0.74	0.67	0.60	0.53	0.62		
Japan Aluminum Association *4	CO2 emissions (with credits)															126	117	122	-17.6%	
	CO2 emissions (excluding credits)		148	162	152	161	163	155	161	165	163	160	154	156	135	125	130	-12.0%	+4.2%	
	CO2 emissions intensity (with credits)																0.87	0.89	0.82	
	CO2 emissions intensity (excluding credits)		1	1.01	1.01	1.00	1.00	1.03	1.03	1.01	1.00	1.04	0.97	0.99	0.87	0.89	0.82			
	Energy consumption		73.4	84.5	79.8	83.1	80.8	76.8	78.4	78.6	79.1	77.3	77.2	78.0	69.2	66.5	69.5	-5.3%	+4.6%	
	Energy consumption intensity ☆	-11%	0.95	0.95	0.96	0.93	0.89	0.92	0.90	0.86	0.87	0.90	0.87	0.89	0.87	0.89	0.86			
	Production activity index			1	1.16	1.08	1.15	1.18	1.08	1.13	1.18	1.18	1.12	1.14	1.14	1.04	0.96	1.05		

Industry	(☆ : target defined by the industry)	target level	FY1990	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	Compared to FY 1990(%)	Compared to FY 2009(%)
			Brewers Association of Japan	CO2 emissions (with credits)														60.0	56.0
	CO2 emissions (excluding credits) ☆	-10%	112	121	117	114	108	104	99.8	94.5	89.4	87.3	84.8	78.4	62.9	58.3	54.4	-51.7%	-6.7%
	CO2 emissions intensity (with credits)														0.57	0.54	0.51		
	CO2 emissions intensity (excluding credits)		1	0.99	0.95	0.92	0.88	0.85	0.84	0.84	0.80	0.80	0.78	0.73	0.60	0.56	0.54		
	Energy consumption		53.8	60.1	60.2	58.2	54.2	53.3	49.3	45.0	43.7	41.9	41.0	36.9	33.1	31.3	29.5	-45.2%	-5.8%
	Energy consumption intensity		1	1.03	1.02	0.99	0.93	0.91	0.86	0.84	0.82	0.80	0.79	0.72	0.66	0.63	0.61		
	Production activity index		1	1.09	1.09	1.10	1.09	1.09	1.06	1.00	1.00	0.98	0.97	0.96	0.93	0.92	0.90		
Japan Electric Wire and Cable Makers' Association	CO2 emissions (with credits)														68.5	62.9	65.9	-33.8%	+4.8%
	CO2 emissions (excluding credits)		100	92.7	87.3	87.7	91.9	85.5	84.9	88.8	82.7	83.7	81.7	88.8	78.8	71.3	74.9	-24.8%	+5.0%
	CO2 emissions intensity (copper/aluminum) (with credits)														0.96	0.96	1.01		
	CO2 emissions intensity (copper/aluminum) (excluding credits)		1	0.97	1.04	1.11	1.07	1.11	1.10	1.17	1.10	1.06	1.01	1.10	1.10	1.09	1.15		
	CO2 emissions intensity (optical fiber)(with credits)														0.22	0.20	0.21		
	CO2 emissions intensity (optical fiber) (excluding credits)		1	0.77	0.72	0.58	0.45	0.40	0.44	0.49	0.42	0.27	0.26	0.26	0.26	0.23	0.24		
	Energy consumption(copper/aluminum) ☆	-29%	57.5	55.1	52.8	50.0	48.9	43.7	43.0	42.8	41.9	42.2	41.8	41.6	37.0	35.1	37.0	-35.6%	+5.4%
	Energy consumption (optical fiber)		1.3	6.0	5.6	6.9	8.3	9.6	7.1	6.7	5.4	4.6	5.5	6.1	6.0	6.4	6.4		
	Energy consumption intensity(copper/aluminum)		1	1.07	1.17	1.21	1.12	1.16	1.10	1.10	1.06	1.01	0.99	1.00	1.01	1.07	1.12		
	Energy consumption intensity (optical fiber) ☆	-78%	1	0.85	0.81	0.63	0.46	0.40	0.42	0.43	0.39	0.24	0.23	0.22	0.22	0.21	0.22		
	Production activity index (copper/aluminum)		1	0.89	0.79	0.72	0.76	0.65	0.68	0.68	0.69	0.73	0.73	0.73	0.63	0.57	0.57		
	Production activity index (optical fiber)		1	5.38	5.29	8.33	13.82	18.02	13.03	11.75	10.62	14.37	17.98	21.16	20.54	23.59	22.03		
Japan Dairy Industry Association *4	CO2 emissions (with credits)														105	101	100	+20.1%	-0.8%
	CO2 emissions (excluding credits)		83.6	93.4	95.9	100	98	100	91	109	106	108	108	112	111	106	105	+26.1%	-0.4%
	CO2 emissions intensity (with credits)														1.07	1.06	1.05		
	CO2 emissions intensity (excluding credits)		0.91	0.85	0.86	0.88	1	1.03	1.10	1.07	1.04	1.08	1.06	1.09	1.13	1.11	1.10		
	Energy consumption		39.3	47.3	49.1	50.1	48.0	49.2	42.9	50.5	49.8	49.8	50.9	52.1	52.2	51.8	52.1	+32.5%	+0.6%
	Energy consumption intensity ☆	-0.5%	0.89	0.89	0.91	0.91	1	1.04	1.05	1.01	1.00	1.02	1.02	1.04	1.08	1.10	1.12		
	Production activity index	cf. 00	1	1.20	1.21	1.24	1.07	1.06	0.91	1.12	1.12	1.09	1.11	1.12	1.07	1.04	1.05		
Japan Brass Makers Association *4	CO2 emissions (with credits)														48.0	46.5	49.9	-23.8%	+7.3%
	CO2 emissions (excluding credits)		65.5	57.2	50.7	54.1	56.4	47.9	53.6	56.6	57.2	58.0	58.4	62.5	53.6	51.3	55.2	-15.7%	+7.6%
	CO2 emissions intensity (with credits)														0.90	0.91	0.86		
	CO2 emissions intensity (excluding credits)		1	0.88	0.86	0.93	0.85	0.94	0.89	0.97	0.88	0.91	0.88	0.99	1.01	1.00	0.95		
	Energy consumption		37.0	35.4	31.6	32.7	33.3	28.2	30.3	30.7	31.9	31.7	32.5	32.9	28.7	29.0	31.1	-15.8%	+7.3%
	Energy consumption intensity ☆	-9.05%	1	0.97	0.95	1.00	0.89	0.98	0.90	0.93	0.87	0.88	0.87	0.92	0.96	1.00	0.95		
	Production activity index	cf. 95	1	0.99	0.90	0.89	1.02	0.78	0.92	0.89	1.00	0.98	1.01	0.96	0.81	0.78	0.89		
Japan Society of Industrial Machinery *4	CO2 emissions (with credits)	☆ -12.2%													52.3	43.7	45.8	-27.7%	+4.8%
	CO2 emissions (excluding credits)	cf. 97	63.4	61.6	55.2	54.5	55.1	54.7	55.6	58.6	59.5	62.7	61.3	62.8	58.8	48.7	51.3	-19.1%	+5.4%
	CO2 emissions intensity (with credits)														0.99	0.94	1.04		
	CO2 emissions intensity (excluding credits)			1	1.01	1.13	1.17	1.21	1.28	1.38	1.31	1.32	1.18	1.12	1.11	1.04	1.16		
	Energy consumption		33.1	35.1	32.4	30.8	29.7	29.4	28.7	29.0	30.1	31.2	31.4	30.4	29.0	25.4	26.8	-19.2%	+5.5%
	Energy consumption intensity			1	1.04	1.12	1.11	1.15	1.16	1.20	1.16	1.15	1.06	0.95	0.97	0.96	1.07		
	Production activity index			1	0.89	0.78	0.76	0.73	0.71	0.69	0.74	0.77	0.84	0.91	0.86	0.76	0.72		
Japan Bearing Industrial Association *4	CO2 emissions (with credits)														60.5	51.2	61.8	+3.7%	+20.7%
	CO2 emissions (excluding credits)		59.6	56.5	52.6	55.3	59.3	54.8	61.0	66.5	69.6	73.1	71.5	79.8	69.0	57.8	69.9	+17.4%	+20.9%
	CO2 emissions intensity (with credits) ☆	-13%													0.88	0.86	0.81		
	CO2 emissions intensity (excluding credits)	cf. 97		1	1.00	1.00	0.97	1.01	1.04	1.04	1.00	1.00	0.94	0.98	1.01	0.97	0.92		
	Energy consumption		34.9	35.8	34.3	34.7	35.7	33.1	35.3	36.6	39.4	40.4	40.7	42.3	37.3	33.4	40.2	+15.2%	+20.4%
	Energy consumption intensity			1	1.03	0.99	0.92	0.96	0.95	0.90	0.89	0.87	0.84	0.82	0.86	0.88	0.83		
	Production activity index			1	0.93	0.98	1.08	0.96	1.04	1.13	1.24	1.29	1.35	1.44	1.21	1.05	1.35		

Industry	(☆ : target defined by the industry)	target level	FY1990	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	Compared to FY 1990(%)	Compared to FY 2009(%)
Japan Sugar Refiners' Association	CO2 emissions (with credits)	☆ -22%					0.95								42.7	40.2	38.9	-33.0%	-3.2%
	CO2 emissions (excluding credits)		58.0	48.8	47.6	47.4	49.1	48.6	45.8	47.8	43.9	43.0	42.8	44.2	43.5	41.0	39.7	-31.6%	-3.1%
	CO2 emissions intensity (with credits)														0.89	0.86	0.84		
	CO2 emissions intensity (excluding credits)		1	0.94	0.94	0.94	0.95	0.96	0.93	0.95	0.89	0.85	0.90	0.92	0.90	0.88	0.86		
	Energy consumption		24.3	22.1	21.6	21.5	22.0	21.8	20.1	20.9	19.6	19.7	20.4	21.1	20.5	19.9	19.3	-20.5%	-2.8%
	Energy consumption intensity		1	1.01	1.02	1.02	1.01	1.03	0.97	0.98	0.95	0.96	1.03	1.03	1.02	1.01	1.00		
	Production activity index		1	0.90	0.88	0.87	0.90	0.88	0.85	0.87	0.85	0.85	0.82	0.84	0.83	0.81	0.80		
Japan Sanitary Equipment Industry Association	CO2 emissions (with credits)	☆ -25%													25.4	23.3	21.2	-55.6%	-9.0%
	CO2 emissions (excluding credits)		47.8	41.5	34.8	35.4	36.4	37.2	35.3	36.3	36.1	35.0	33.3	29.8	26.9	24.6	22.5	-52.9%	-8.4%
	CO2 emissions intensity (with credits)														0.52	0.53	0.42		
	CO2 emissions intensity (excluding credits)		1	0.81	0.82	0.83	0.80	0.83	0.80	0.78	0.73	0.69	0.62	0.56	0.55	0.56	0.44		
	Energy consumption		22.4	21.4	18.3	18.4	18.3	18.2	17.0	16.9	16.8	16.7	16.5	14.9	13.6	12.9	12.0	-46.7%	-7.4%
	Energy consumption intensity		1	0.89	0.91	0.91	0.86	0.86	0.82	0.77	0.73	0.70	0.65	0.59	0.59	0.63	0.50		
	Production activity index		1	1.08	0.89	0.89	0.95	0.94	0.93	0.98	1.03	1.07	1.13	1.12	1.03	0.92	1.07		
The Japan Soft Drinks Association	CO2 emissions (with credits)														100.6	99.2	100.3	+118.7%	+1.1%
	CO2 emissions (excluding credits)		45.9	65.9	68.4	74.6	80.7	85.1	88.7	94.1	100.0	103.0	104.5	108.4	106.2	104.3	105.7	+130.4%	+1.4%
	CO2 emissions intensity (with credits)														1.04	1.03	0.97		
	CO2 emissions intensity (excluding credits)	☆ -6%	1	0.98	0.99	1.02	1.07	1.04	1.09	1.10	1.08	1.17	1.14	1.11	1.10	1.08	1.02		
	Energy consumption		20.3	30.9	32.9	35.8	38.4	40.9	42.3	44.3	47.6	49.4	51.7	53.6	53.5	54.7	55.8	+174.6%	+2.1%
	Energy consumption intensity		1	1.04	1.07	1.10	1.15	1.13	1.17	1.16	1.16	1.27	1.27	1.24	1.25	1.28	1.22		
	Production activity index		1	1.47	1.51	1.60	1.64	1.78	1.77	1.87	2.01	1.92	2.00	2.13	2.10	2.11	2.25		
Limestone Association of Japan	CO2 emissions (with credits)														31.3	27.4	27.6	-39.1%	+0.7%
	CO2 emissions (excluding credits)		45.3	41.8	39.8	40.4	41.5	41.2	39.0	36.4	35.5	36.2	35.6	36.8	33.8	29.3	29.6	-34.6%	+1.2%
	CO2 emissions intensity (with credits)														0.91	0.91	0.90		
	CO2 emissions intensity (excluding credits)		1	0.91	0.95	0.98	0.98	1.02	0.95	0.97	0.96	0.95	0.93	0.98	0.98	0.97	0.96		
	Energy consumption		22.6	22.0	21.1	20.9	20.9	20.6	19.0	17.2	17.1	17.1	17.1	16.9	15.7	14.0	14.2	-37.0%	+1.5%
	Energy consumption intensity	☆ -6%	1	0.96	1.01	1.02	0.99	0.99	0.92	0.92	0.93	0.91	0.90	0.91	0.92	0.93	0.93		
	Production activity index		1	1.02	0.93	0.91	0.94	0.92	0.91	0.82	0.81	0.84	0.85	0.83	0.76	0.67	0.68		
Japan Machine Tool Builders'	CO2 emissions (with credits)														25.4	15.9	20.3	-11.5%	+27.7%
	CO2 emissions (excluding credits)		22.9	20.8	22.8	20.0	20.6	19.4	18.4	20.3	22.6	24.9	26.2	30.5	29.2	18.0	23.1	+0.6%	+28.2%
	CO2 emissions intensity (with credits)														0.78	1.32	1.01		
	CO2 emissions intensity (excluding credits)			1	1.00	1.14	1.02	1.02	1.27	1.16	1.03	0.90	0.84	0.87	0.90	1.50	1.15		
	Energy consumption	☆ -6%	13.5	13.5	15.2	12.8	12.6	11.9	10.7	11.2	12.7	13.6	14.6	16.0	15.7	10.3	13.1	-2.6%	+27.9%
	Energy consumption intensity	☆ -6%		1	1.03	1.12	0.96	0.96	1.15	0.98	0.89	0.76	0.73	0.71	0.76	1.33	1.01		
	Production activity index	cf. 97	1	1.00	1.10	0.85	0.98	0.92	0.69	0.85	1.06	1.33	1.50	1.67	1.55	0.57	0.96		
Flour Millers Association	CO2 emissions (with credits)														18.5	17.2	17.8	+5.4%	+3.5%
	CO2 emissions (excluding credits)		16.9	18.6	18.0	18.6	19.1	18.9	20.3	22.5	21.3	21.2	21.1	22.9	21.7	20.1	20.7	+22.7%	+3.3%
	CO2 emissions intensity (with credits)														0.96	0.89	0.89		
	CO2 emissions intensity (excluding credits)	☆ -5%	1	1.00	0.93	0.95	0.97	0.96	1.03	1.12	0.99	1.07	1.08	1.16	1.13	1.04	1.04		
	Energy consumption		10.8	12.6	12.9	12.7	12.5	12.4	12.5	13.0	12.7	12.3	12.5	12.6	12.2	12.1	12.4	+15.2%	+3.0%
	Energy consumption intensity		1	1.06	1.04	1.02	0.99	0.98	1.00	1.02	0.99	0.98	1.00	1.00	0.99	0.98	0.98		
	Production activity index		1	1.10	1.15	1.16	1.17	1.16	1.16	1.19	1.17	1.17	1.16	1.17	1.14	1.14	1.18		

Industry	(☆ : target defined by the industry)	target level	FY1990	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	Compared to FY 1990(%)	Compared to FY 2009(%)	
The Shipbuilders' Association of Japan The Cooperative Association of Japan Shipbuilders	CO2 emissions (with credits)														30.1	27.6	28.4	+98.4%	+2.9%	
	CO2 emissions (excluding credits)		14.3				18.1	17.8	24.1	25.8	26.5	28.6	30.7	35.4	35.9	32.4	33.4	+133.6%	+3.1%	
	CO2 emissions intensity (with credits)														0.79	0.67	0.69			
	CO2 emissions intensity (excluding credits)		1				0.73	0.75	1.00	0.98	0.84	0.85	0.84	0.92	0.94	0.79	0.81			
	Energy consumption		9.4				12.6	12.3	15.6	15.5	16.5	17.1	18.9	19.8	20.4	19.9	20.4	+117.6%	+2.6%	
	Energy consumption intensity	☆	-10%	1			0.87	0.89	0.94	0.96	0.90	0.92	0.94	0.95	0.94	0.90	0.87			
Production activity index			1			1.74	1.66	1.68	1.84	2.20	2.34	2.57	2.70	2.65	2.87	2.90				
Japan Industry Vehicles Association	CO2 emissions (with credits)	☆	-10%												5.7	3.8	4.2	-32.0%	+10.5%	
	CO2 emissions (excluding credits)			6.2	6.1	5.7	6.1	6.1	5.4	5.7	6.0	6.1	6.6	6.5	7.3	6.2	4.1	4.6	-26.1%	+10.4%
	CO2 emissions intensity (with credits)														0.99	1.25	1.00			
	CO2 emissions intensity (excluding credits)			1	1.22	1.47	1.53	1.36	1.33	1.40	1.37	1.21	1.15	1.05	1.04	1.08	1.35	1.09		
	Energy consumption			3.3	3.5	3.3	3.4	3.4	3.0	3.1	3.2	3.3	3.5	3.5	3.8	3.2	2.3	2.5	-22.5%	+11.3%
	Energy consumption intensity			1	1.33	1.60	1.61	1.43	1.42	1.44	1.37	1.23	1.15	1.07	1.02	1.06	1.40	1.15		
Production activity index			1	0.81	0.63	0.65	0.72	0.65	0.66	0.71	0.82	0.93	1.00	1.13	0.93	0.50	0.68			
Japan Association of Rolling Stock Industries	CO2 emissions (with credits)	☆	-8%												3.3	2.9	2.9	-32.5%	+0.0%	
	CO2 emissions (excluding credits)			4.3	3.0	2.9	3.0	2.9	2.7	2.9	3.1	3.1	3.4	3.5	4.0	3.7	3.3	3.2	-24.9%	-0.8%
	CO2 emissions intensity (with credits)														0.49	0.38	0.42			
	CO2 emissions intensity (excluding credits)			1	0.76	0.74	0.67	0.66	0.66	0.66	0.76	0.48	0.55	0.50	0.60	0.55	0.42	0.47		
	Energy consumption			2.4	1.8	1.8	1.8	1.7	1.6	1.7	1.7	1.8	1.9	2.0	2.1	2.0	1.9	1.8	-22.5%	-0.7%
	Energy consumption intensity			1	0.83	0.83	0.74	0.70	0.71	0.68	0.76	0.49	0.55	0.51	0.57	0.53	0.43	0.49		
Production activity index			1	0.91	0.91	1.04	1.02	0.96	1.04	0.93	1.51	1.43	1.63	1.55	1.58	1.80	1.59			
Japan Petroleum Development Association	CO2 emissions (with credits)														61.9	63.1	57.1	+157.0%	-9.5%	
	CO2 emissions (excluding credits)			22.2	27.0	25.4	24.4	29.3	29.0	35.2	38.1	33.7	39.0	44.9	59.0	62.5	63.6	57.6	+159.1%	-9.4%
	CO2 emissions intensity (with credits)														0.78	0.84	0.82			
	CO2 emissions intensity (excluding credits)	☆	-20%	1	0.83	0.79	0.74	0.85	0.86	1.02	1.06	0.75	0.79	0.85	0.89	0.80	0.85	0.84		
	Energy consumption			6.0	6.8	6.9	6.4	6.9	6.3	7.0	6.6	7.0	8.4	9.0	10.2	9.7	9.6	9.4	+58.1%	-2.1%
	Energy consumption intensity			1	0.90	0.93	0.87	0.89	0.81	0.86	0.74	0.76	0.80	0.81	0.81	0.77	0.81	0.86		
Production activity index			1	1.28	1.25	1.23	1.31	1.30	1.38	1.50	1.55	1.75	1.86	2.12	2.11	2.00	1.85			
Emissions from industrial processes *1			6,208	6,067	5,436	5,437	5,489	5,317	5,192	5,033	5,020	5,148	5,218	5,045	4,660	4,178	4,233			
Revisions *2	CO2 emissions (with credits)														-131	-120	-115			
	CO2 emissions (excluding credits)			-69	-118	-113	-102	-107	-108	-122	-142	-142	-144	-148	-176	-157	-140	-136		
	Energy consumption			-56	-71	-59	-60	-97	-91	-76	-82	-87	-98	-104	-112	-106	-103	-104		
Total	CO2 emissions (with credits)														45,172	42,106	44,347	-12.3%	+5.3%	
	CO2 emissions (excluding credits)			50,584	51,978	49,239	50,256	49,629	48,097	49,002	49,422	49,476	49,708	49,628	51,069	46,731	43,379	45,723	-9.6%	+5.4%
	Energy consumption *3			16,441	17,397	16,623	16,813	16,515	15,935	16,208	16,334	16,472	16,522	16,608	17,083	15,690	14,787	15,562	-5.3%	+5.2%

Trends in the Transportation, Commercial and Other Sectors *6

Commercial and Other Sectors

(10,000t-CO₂; 10,000kl, crude oil equivalents)

Industries	(☆ : target defined by the industry)	target level	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	Compared to FY 1990(%)	Compared to FY 2009(%)	
			1990	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010				
Japan Association of Refrigerated Warehouses	CO2 emissions (with credits)															64.4	58.3	61.1	+10.6%	+4.8%	
	CO2 emissions (excluding credits)		55.2	57.4	57.6	61.1	60.9	61.9	65.9	69.9	69.8	73.9	71.3	77.3	76.7	68.4	71.9	+30.2%	+5.1%		
	CO2 emissions intensity (with credits)															0.85	0.76	0.79			
	CO2 emissions intensity (excluding credits)		1	0.82	0.80	0.84	0.83	0.85	0.91	0.96	0.96	1.00	0.97	1.03	1.02	0.89	0.93				
	Energy consumption		36.2	43.1	44.6	44.7	42.2	42.9	42.5	42.0	43.3	44.4	44.0	43.2	43.6	42.0	43.9	+21.3%	+4.6%		
	Energy consumption intensity ☆	-8%	1	0.94	0.95	0.93	0.88	0.90	0.89	0.88	0.91	0.92	0.91	0.88	0.88	0.84	0.87				
Production activity index		1	1.27	1.30	1.32	1.32	1.32	1.31	1.32	1.31	1.33	1.33	1.35	1.37	1.39	1.40					
Japan LP Gas Association	CO2 emissions (with credits)															2.0	1.8	1.8	-17.0%	0.8%	
	CO2 emissions (excluding credits)		2.2								2.4	2.5	2.4	2.5	2.4	2.6	2.3	2.1	2.2	-2.3%	1.2%
	CO2 emissions intensity (with credits)															0.88	0.85	0.85			
	CO2 emissions intensity (excluding credits)		1								0.93	0.97	0.97	1.00	0.98	1.07	1.04	0.99	0.99		
	Energy consumption		1.4								1.5	1.5	1.5	1.5	1.5	1.5	1.3	1.3	1.3	-10.0%	0.0%
	Energy consumption intensity ☆	-7%	1								0.92	0.89	0.92	0.91	0.92	0.91	0.90	0.92	0.92		
Production activity index		1								1.16	1.16	1.12	1.12	1.12	1.12	1.03	0.97	0.99			
Japanese Bankers Association *7	CO2 emissions (with credits)															48.2	43.2	43.0	-21.2%	-0.5%	
	CO2 emissions (excluding credits)	cf. 00						54.5	55.0	56.5	58.7	56.2	55.3	53.8	60.5	57.4	50.8	50.6	-7.1%	-0.2%	
	Energy consumption ☆	-12%						37.8	38.0	36.5	35.2	34.9	33.2	33.2	33.8	32.7	31.2	30.9	-18.2%	-0.7%	
The Real Estate Companies Association of Japan	CO2 emissions intensity (with credits)															0.83	0.76	0.76			
	CO2 emissions intensity (excluding credits)		1	0.86	0.88	0.86	1.01	0.84	0.94	0.97	0.98	1.03	0.93	1.04	0.99	0.89	0.89				
	Energy consumption ☆	-5%	1	0.97	1.03	0.94	1.07	0.90	0.95	0.94	0.97	1.03	0.95	0.98	0.95	0.91	0.91				
The General Insurance Association of Japan *7	CO2 emissions (with credits)															3.3	2.9	2.8	-17.6%	-3.4%	
	CO2 emissions (excluding credits)	cf. 00						3.4	4.3	4.1	4.1	3.7	3.7	3.6	3.9	3.8	3.3	3.2	-5.7%	-1.8%	
	Energy consumption ☆	-18%						2.3	2.6	2.4	2.3	2.2	2.1	2.1	2.1	2.0	1.9	1.8	-20.3%	-3.1%	
The Life Insurance Association of Japan *7	CO2 emissions (with credits)															10.8	10.0	10.2	-11.2%	2.0%	
	CO2 emissions (excluding credits)	cf. 06										11.4	11.7	11.5	13.0	12.7	11.6	11.7	2.3%	1.3%	
	Energy consumption ☆	-2%										6.9	6.8	6.9	7.1	7.1	6.9	6.9	0.8%	0.5%	
NTT Group	CO2 emissions (with credits)															313	298	302	135.9%	1.4%	
	CO2 emissions (excluding credits)		128	157	162	180	214	230	275	312	310	330	341	370	369	346	351	174.1%	1.5%		
	CO2 emissions intensity (with credits) ☆	-35%														1.47	1.43	1.43			
	CO2 emissions intensity (excluding credits)		1	0.81	0.82	0.85	0.91	0.96	1.23	1.37	1.40	1.50	1.55	1.69	1.73	1.66	1.66				
	Energy consumption		84	118	126	132	144	155	172	182	188	194	206	204	207	208	210	150.7%	0.9%		
	Energy consumption intensity		1.00	0.93	0.97	0.94	0.94	0.99	1.17	1.22	1.29	1.35	1.43	1.43	1.48	1.53	1.52				
Production activity index		1	1.51	1.56	1.67	1.83	1.87	1.75	1.77	1.73	1.72	1.72	1.71	1.67	1.67	1.63	1.65				
KDDI *7	CO2 emissions (with credits) ☆	1.52Mt														64.2	67.2	63.2	49.1%	-6.0%	
	CO2 emissions (excluding credits)											42.4	42.6	53.5	64.0	75.4	76.5	78.9	74.4	75.5%	-5.7%
	Energy consumption	cf. 11										25.4	26.4	32.0	39.5	42.1	43.5	48.4	45.4	78.7%	-6.2%
	Production activity index											1.00	1.09	1.23	1.39	1.48	1.41	1.37	1.34		
Japan Foreign Trade Council, Inc. *7	CO2 emissions (with credits) ☆	0.35Mt														3.7	3.5	3.5	-40.5%	-0.2%	
	CO2 emissions (excluding credits)				5.8	5.9	5.6	5.5	5.6	6.3	5.5	4.6	4.3	4.6	4.4	4.1	4.1	-30.4%	0.1%		
	Energy consumption				4.4	4.2	3.8	3.7	3.6	3.7	3.3	2.7	2.6	2.6	2.5	2.5	2.5	-43.8%	-0.4%		
Japan Federation of Printing Industries *7	CO2 emissions (with credits) ☆	-7.3%														114.3	105.4	106.2	-14.6%	0.8%	
	CO2 emissions (excluding credits)															124.3	123.6	131.0	-5.6%	1.1%	
	CO2 emissions intensity (with credits)	cf. 05														0.83	0.76	0.78			
	CO2 emissions intensity (excluding credits)															0.92	0.84	0.86			
	Energy consumption															68.6	69.4	69.7	-2.7%	1.1%	
	Energy consumption intensity															1.00	0.98	0.94			
Production activity index															1.00	1.03	1.08				

Transportation Sector

(10,000t-CO₂; 10,000kl, crude oil equivalents)

Industries	(☆: target defined by the industry)	target level	FY 1990	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	Compared to FY 1990(%)	Compared to FY 2009(%)
The Scheduled Airlines Associations of Japan	CO2 emissions intensity (with credits) ☆	-13.5%													0.85	0.84	0.81		
	CO2 emissions intensity (excluding credits)		1	0.91	0.90	0.89	0.90	0.89	0.87	0.89	0.88	0.88	0.88	0.87	0.85	0.84	0.81		
The Japanese Shipowners' Association	CO2 emissions (with credits)														6,365	5,762	5,780	49.7%	0.3%
	CO2 emissions (excluding credits)		3,862	4,279	4,366	4,505	4,708	4,562	4,583	4,984	5,262	5,585	6,031	6,481	6,365	5,762	5,780	49.7%	0.3%
	CO2 emissions intensity (with credits) ☆	-15%	1	0.86	0.90	0.85	0.84	0.85	0.87	0.85	0.88	0.88	0.86	0.84	0.85	0.82	0.83		
	CO2 emissions intensity (excluding credits)		1	0.86	0.90	0.85	0.84	0.85	0.87	0.85	0.88	0.88	0.86	0.84	0.85	0.82	0.83		
Japan Federation of Coastal Shipping Associations	Energy consumption intensity		1	0.86	0.90	0.85	0.84	0.85	0.87	0.85	0.88	0.88	0.86	0.84	0.85	0.82	0.83		
	Production activity index		1	1.28	1.26	1.37	1.45	1.38	1.36	1.53	1.54	1.65	1.81	2.01	1.95	1.81	1.79		
	CO2 emissions (with credits)														720	656	705	-18.0%	7.5%
	CO2 emissions (excluding credits)		859	904	876	886	919	934	895	854	787	790	794	772	720	656	705	-18.0%	7.5%
	CO2 emissions intensity (with credits) ☆	-3%	1	1.07	1.09	1.09	1.07	1.08	1.07	1.10	1.01	1.04	1.07	1.06	1.07	1.09	1.09		
	CO2 emissions intensity (excluding credits)		1	1.07	1.09	1.08	1.07	1.07	1.06	1.09	1.00	1.04	1.06	1.06	1.07	1.09	1.09		
All Japan Freight Forwarders Association *7	Energy consumption		314	330	320	323	335	340	326	311	287	288	289	281	262	239	256	-18.4%	7.5%
	Energy consumption intensity		1	1.07	1.09	1.08	1.07	1.07	1.06	1.09	1.00	1.04	1.06	1.06	1.07	1.09	1.09		
	Production activity index		1	0.98	0.94	0.95	1.00	1.01	0.98	0.91	0.91	0.88	0.87	0.85	0.78	0.70	0.75		
	CO2 emissions (with credits) ☆	-15% cf. 98			15.2				14.6	14.6	14.6	14.5	14.1	13.7	13.6	13.4	13.3	12.9	-15.6%
Non-governmental Railways Association	CO2 emissions (excluding credits)														13.4	13.3	12.9	-15.6%	-3.6%
	Energy consumption				5.7			5.5	5.5	5.5	5.5	5.3	5.2	5.1	5.0	5.0	4.8	-15.6%	-3.6%
	CO2 emissions (with credits)														192	179	179	-9.9%	0.5%
	CO2 emissions (excluding credits)		199	192	188	201	198	198	214	227	221	224	212	234	228	210	211	6.0%	0.8%
	CO2 emissions intensity (with credits)		1	0.86	0.85	0.89	0.86	0.86	0.93	0.97	0.95	0.96	0.91	1.00	0.81	0.74	0.75		
	CO2 emissions intensity (excluding credits)		1	0.86	0.85	0.89	0.86	0.86	0.93	0.97	0.95	0.96	0.91	1.00	0.97	0.87	0.89		
Non-governmental Railways Association	Energy consumption		131	144	146	147	137	137	138	136	137	134	131	131	130	129	129	-1.2%	0.3%
	Energy consumption intensity ☆	-17%	1	0.99	1.00	1.00	0.91	0.91	0.91	0.89	0.90	0.88	0.85	0.85	0.84	0.82	0.83		
	Production activity index		1	1.12	1.12	1.13	1.15	1.16	1.16	1.17	1.17	1.17	1.17	1.18	1.18	1.20	1.20		

*1 "Emissions from industrial processes" refers to CO2 emitted by non-energy sources in the course of the manufacturing process.

*2 Total CO2 emissions and energy consumption for the 34 industries are calculated on the basis of "generating end" electric power input per unit output for the respective industries on a fiscal year basis. On the other hand, in follow-up surveys, industries may also choose to report emissions in terms of "demand end" electric power input per unit output or fixed (the ratio in fiscal 1990) electric power input per unit output (as in the Japan Gas Association, 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, and Japan Machine Tool Builders' Association). Revisions are defined as the differences between the totals of data submitted by industries and the totals of the revised industry figures.

*3 Due to a revision of the Caloric Value Table, calculations of emissions before fiscal 1990, 2000-2004, and after 2005 are based on different heat conversion coefficients.

*4 In cases where an industry uses a year other than fiscal 1990 as the base year, intensity indexes are calculated based on figures for the base year used by that industry (Japan Aluminium Association and Japan Copper and Brass Association use fiscal 1995, The Japan Society of Industrial Machinery Manufacturers, The Japan Bearing Industrial Association, and Japan Machine Tool Builders' Association use fiscal 1997 as the base year, and Japan Dairy Industry Association uses fiscal 2000 as the base year.)

*5 The figures in the table above are based on the basic calculation method used by Keidanren. The figures for the target and the CO2 emissions in fiscal 2010 of Japan Gas Association and The Japan Rubber Manufacturers Association, based on different method from the basic one are the following (refer to the industry-specific report in Japanese):

Japan Gas Association (targets are 349,000 t-CO₂ for CO2 emissions and 9.0g/m³ for CO2 emissions intensity); CO2 emissions in FY 2010: 291,000 t-CO₂ (with credits) / 322,000 t-CO₂ (excluding credits); CO2 emission intensity: 7.9g-CO₂/m³ (with credits) / 8.7g-CO₂/m³ (excluding credits)

The Japan Rubber Manufacturers Association (target is to reduce CO2 emissions -10% compared to fiscal 1990): FY 1990: 1.98 Mt-CO₂; FY 2010: 1.43 Mt-CO₂ (with credits) / 1.60 Mt-CO₂ (excluding credits).

*6 The figures regarding CO2 emissions, energy consumption, and their intensities in the tables are submitted from participating industries of commercial and transportation sectors.

*7 Japan Foreign Trade Council, Inc. and All Japan Freight Forwarders Association use fiscal 1998, Japanese Bankers Association and the General Insurance Association of Japan use fiscal 2000, KDDI uses fiscal 2003, Japan Federation of Printing Industries uses fiscal 2005, and The Life Insurance Association of Japan uses fiscal 2006 as their base year.

*8 CO2 emissions intensity and energy consumption intensity are rounded off after the automatic calculation based on CO2 emissions, energy consumption, and production activity figures.

*9 In fiscal 2008 and fiscal 2010, only electric power companies retired credits, and other industries did not do so. Therefore, data with credits and excluding credits shown for each industry are the result of having two CO2 emission factors accompanying electricity use, one indicating with credits and the other excluding credits.

*10 In fiscal 2011, one company withdrew from Japan Dairy Industry Association. Since the data on that company are available only back to fiscal 2000, the data concerning the company have been eliminated based on the following: (1) for fiscal 2000 through 2009, the company's actual CO2 emissions; and (2) for fiscal 1990 through 1999, the percentage of the company's CO2 emissions in relation to the association's fiscal 2000 total emissions (2%). The percentage of the company's CO2 emissions in relation to the total emissions by all the 34 industries was 0.4%.

*11 Because of the loss of data at offices struck by the Great East Japan Earthquake, for fiscal 1990 and thereafter the data for Japan Chemical Industry Association and for the Federation of Pharmaceutical Manufacturers' Associations of Japan and Japan Pharmaceutical Manufacturers Association do not include data concerning one company and one place of business, respectively.

(Attachment 3)

Examples of Efforts to Achieve Targets Reported by Participating Industries

1. Industrial and Energy-Conversion Sectors

Industry	Examples of efforts made
The Federation of Electric Power Companies of Japan	<ol style="list-style-type: none"> 1. Shift to low-carbon energy on the supply side (reduction of CO₂ emission intensity) <ol style="list-style-type: none"> a) Expanded use of non-fossil fuel energy b) Improved efficiency of electric power plants c) International efforts (use of Kyoto Mechanisms, sectoral approaches) 2. Increased efficiency of energy use on the demand side <ol style="list-style-type: none"> a) Energy savings (promotion of electrification, diffusion of energy-saving and high-efficiency electrical equipment) 3. Research and development <ol style="list-style-type: none"> a) Clean coal technology, CO₂ capture and storage technology, next-generation transmission technology, ultra high-efficiency heat pumps, electric vehicles
Petroleum Association of Japan	<ol style="list-style-type: none"> 1. More advanced operational control by taking advantage of the progress of control technology and optimizing technology 2. Expanded sharing of heat between equipment, and expanded installation of waste heat and other waste energy recovery facilities 3. Increased efficiency through appropriate maintenance of facilities 4. Use of high-efficiency equipment and catalysts 5. Energy-saving measures taking advantage of energy-saving subsidy programs <ol style="list-style-type: none"> a) Installation of variable-speed gas compressors b) Waste heat recovery through collecting exhaust steam from steam traps c) Reduction of energy use in heating furnaces through upgrading to high-performance trays
The Japan Gas Association	<ol style="list-style-type: none"> 1. Promotion of energy-saving measures at city gas manufacturing plants <ol style="list-style-type: none"> a) Installation of cogeneration systems b) Use of LNG cold energy c) Increased efficiency of facilities d) Operations optimized in accordance with demand and other factors
The Japan Iron and Steel Federation	<ol style="list-style-type: none"> 1. Strengthened waste heat recovery, and increased efficiency of facilities 2. Establishment of technology for the clean use of coal, such as through desulphurization technology 3. Achievement of comprehensive energy efficiency where most of the energy used in plants is met through the recovery and use of byproduct gas and waste energy (steam, electricity) derived from coal 4. Energy savings through resource recycling (waste plastic, waste tires)
Japan Chemical Industry Association	<ol style="list-style-type: none"> 1. Improved efficiency of facilities and equipment 2. Improved operational methods

	<ul style="list-style-type: none"> 3. Recovery of waste energy 4. Rationalization of processes 5. Fuel conversion
Japan Paper Association	<ul style="list-style-type: none"> 1. Installation of energy-saving facilities <ul style="list-style-type: none"> a) Dryer hood heat recovery systems b) Alterations made to presses c) Installation of inverters 2. Installation of high-efficiency facilities <ul style="list-style-type: none"> a) Improved efficiency of turbines b) Upgrading to high-efficiency motors and transformers c) High-efficiency lighting 3. Overhaul of processes (shortened and unified processes) 4. Conversion to renewable energy (black liquor, waste materials, bark, paper sludge), waste product energy (RPF, waste plastic, waste tires, waste oil), and fuel with low CO₂ emissions
Japan Cement Association	<ul style="list-style-type: none"> 1. Promotion of the spread of energy-saving facilities 2. Expanded use of energy substitute waste products 3. Expanded use of raw material substitute waste products 4. Higher production ratio for mixed cement
The four electrical/electronics-related groups	<ul style="list-style-type: none"> 1. Reduction of boiler fuel consumption through operational improvements in facilities that use steam 2. Energy saving through optimizing operating conditions for air conditioning equipment for clean rooms
Japan Federation of Construction Contractors	<ul style="list-style-type: none"> 1. Reduction of construction soil that is hauled away and reduction of transported distances 2. Promotion of no idling and fuel-saving operation of vehicles 3. Strict enforcement of appropriate servicing of heavy equipment and vehicles 4. Promotion of the adoption of superior energy-saving methods, construction machinery, and construction vehicles 5. Promotion of the use of high-efficiency temporary electrical equipment 6. Promotion of energy-saving activities at on-site offices
Japan Automobile Manufacturers Association and Japan Auto-Body Industries Association	<ul style="list-style-type: none"> 1. Facility measures <ul style="list-style-type: none"> a) Measures on the energy supply side (installation of high-efficiency compressors, implementation of measures to prevent pressure losses and leakage of compressed air, and use of high-efficiency boilers and energy-saving transformers) b) Measures regarding high energy-consumption facilities (energy saving through such facility measures as improving the method for controlling booth air conditioning, integration of casting dust collectors, and improvement of air conditioners; and replacement of freezers and air conditioners [including heaters]) 2. Measures to increase productivity <ul style="list-style-type: none"> a) Use of more advanced energy supply and other operational control technology (energy savings through operational improvements [efficient operation, improved energy savings at work sites, etc.] and

	<p>through turning off boilers, transformers, pumps, and lighting when unneeded or through their intermittent operation; reduction of air and steam supply pressure; unit control of compressor operation; and reconsideration of pipe routing)</p> <p>b) Consolidation, rationalization, etc., of production lines (consolidation and rationalization of painting, casting, and processing lines)</p> <p>3. Fuel conversion, use of ESCO services, etc.</p> <p>a) Conversion of fuel (conversion from fuel oil to city gas for the fuel of aluminum melting furnaces and conversion from LPG and butane gas to city gas for the fuel of heat treatment furnaces)</p> <p>b) Energy savings through operational improvements in facilities, installation of solar power systems, etc.</p> <p>4. Energy saving effects through supply chain and other coordination</p> <p>a) Sharing information on energy-saving examples and technologies</p>
Japan Auto Parts Industries Association	<p>1. Halting of no-load operation and other improvements to operational methods</p> <p>2. Improved efficiency of facilities and equipment</p> <p>3. Rationalization of processes</p> <p>4. Cogeneration and recovery of waste energy</p> <p>5. Mutual sharing of energy-saving technology, exchange of information about energy use</p>
Japan Federation of Housing Organizations	<p>1. Planning and design stage</p> <p>a) Preservation of the natural environment</p> <p>2. Creation of a quality living environment</p> <p>a) Promotion of increased housing functionality, including earthquake resistance and energy-saving improvement work; improvement of the interior environment; interior and exterior greenery</p> <p>b) Use of the housing performance indication system</p> <p>c) Development and diffusion of housing that represent such concepts as “environmentally symbiotic housing,” “self-sustaining houses that recycle energy and resources,” and “LO-House.”</p> <p>d) Implementation of comprehensive environmental functionality evaluations at the design stage through CASBEE-Sumai (new single-family detached housing)</p> <p>e) Use of high-efficiency facilities and equipment and use of alternative energy</p> <p>f) Diffusion of high-insulation, highly air-tight housing (housing meeting next-generation energy-saving standards)</p> <p>3. Usage stage</p> <p>a) Educational activities for home buyers to promote the reduction of CO₂ emissions at the usage stage</p> <p>4. Demolition, processing, and disposal stage</p> <p>a) Rigorous adherence to segregated demolition</p> <p>b) Promotion of the reuse of building material waste</p>
Japan Mining Industry Association	<p>1. Improved productivity by consolidation and scaling up of production facilities</p>

	<ol style="list-style-type: none"> 2. Effective use of unused heat 3. Improved efficiency through the replacement of old facilities 4. Improved efficiency through facility measures 5. Reduction of energy intensity through operational ingenuity 6. Thermal recycling through shredder dust (ASR) processing 7. Use of reclaimed oil and waste plastic
Lime Manufacture Association	<ol style="list-style-type: none"> 1. Expanded use of recycled fuel 2. Improved operational methods 3. Recovery of waste energy 4. Rationalization of processes 5. Improved efficiency of facilities and machinery
The Japan Rubber Manufacturers Association	<ol style="list-style-type: none"> 1. New and expanded installation of cogeneration systems <ol style="list-style-type: none"> a) New and expanded installation of high-efficiency cogeneration systems burning city gas b) Cogeneration fuel switched from fuel oil to LNG 2. Installation of high-efficiency equipment <ol style="list-style-type: none"> a) Installation of high-efficiency fans, motors, lighting fixtures, and other such equipment 3. Implementation of steady energy-saving activities as before <ol style="list-style-type: none"> a) Insulation of heating facilities, prevention of leakage, heat recovery b) Increased operational efficiency, such as through rotation control, intermittent operation, and scaling down 4. Increased efficiency through energy conversion <ol style="list-style-type: none"> a) Process improvements, such as installation of furnaces that burn waste oil and modifying furnaces and boilers to burn gas 5. Increased efficiency of air conditioning systems <ol style="list-style-type: none"> a) Installation of ice-based thermal energy storage and absorption refrigerators 6. Increased product durability <ol style="list-style-type: none"> a) Significant increase in durability achieved by switching from bias tires to radial tires 7. Tire labeling system
The Federation of Pharmaceutical Manufacturers' Associations of Japan and Japan Pharmaceutical Manufacturers Association	<ol style="list-style-type: none"> 1. Energy substitution 2. Selection of high-efficiency equipment 3. Reduction of radiated heat loss through insulating equipment and pipes 4. Reconsideration of operational and control methods for facilities and equipment 5. Changes to standard and established values 6. Installation of inverters
Flat Glass Manufacturers Association of Japan	<ol style="list-style-type: none"> 1. Increased efficiency of production through the scrapping and consolidation of flat glass manufacturing facilities (melting furnaces) 2. Improved heat recovery efficiency through the regular maintenance of furnaces (cold maintenance) 3. Consolidation of production to reduce the loss per furnace arising from changing production items or colors

	<p>4. Development and adoption of new combustion technology with high energy efficiency</p> <p>5. Improved operating conditions for equipment</p>
Japan Aluminium Association	<p>1. Improved energy efficiency through energy-saving operations and process improvements (improved yield)</p> <p>2. Promotion of improvement in such areas as energy recovery, energy efficiency, productivity, and yield</p> <p>3. Holding of meetings to publicize cases of energy-saving improvements and promotion of industry-wide application</p> <p>4. Promotion of active aluminum recycling (global program)</p> <p>5. Support of vehicle weight reductions through the use of aluminum in automobiles and railroad cars (domestic program)</p>
Brewers Association of Japan	<p>1. Power processes</p> <p>a) Fuel conversion to natural gas</p> <p>b) Installation of cogeneration facilities</p> <p>c) Installation of high-efficiency refrigeration and ice-based thermal energy storage systems</p> <p>d) Conversion to ammonia refrigerators and other high-efficiency refrigeration facilities</p> <p>e) Installation of solar power facilities</p> <p>2. Preparation processes</p> <p>a) Installation of new boiling systems</p> <p>b) Installation of steam recompression facilities</p> <p>c) Increased efficiency of waste heat recovery</p> <p>3. Processes for wastewater processing</p> <p>a) Installation of anaerobic wastewater treatment facilities</p> <p>b) Promotion of the recovery and use of methane gas from anaerobic processes</p> <p>c) Installation of biogas cogeneration facilities</p> <p>d) Installation of biogas boilers and other high-efficiency boilers</p> <p>e) Installation of fuel cells</p>
The Japanese Electric Wire & Cable Makers' Association	<p>1. Efficient use of heat</p> <p>a) Measures to improve the insulation of furnaces</p> <p>b) Fuel conversion</p> <p>c) Recovery and use of waste heat</p> <p>d) Improvement of steam traps</p> <p>e) Increased insulation of steam pipes</p> <p>2. Installation of high-efficiency facilities</p> <p>a) Higher speed facilities and facilities for producing wires without joints</p> <p>b) Extruder motors</p> <p>c) Inverters installed in pumps</p> <p>d) Inverters installed in compressors, unit control of compressors</p> <p>3. More efficient operation of electric power facilities</p> <p>a) A more efficient electric power system through layout changes</p> <p>b) Efficient operation of electric power facilities through the</p>

	consolidation of operational facilities
Japan Dairy Industry Association	<ol style="list-style-type: none"> 1. Consolidation and rationalization of plants (consolidation and improved energy intensity) 2. Fuel conversion (mainly from fuel oil A to natural gas) 3. Installation of cogeneration facilities (for waste heat recovery and as backup power sources) 4. Increased efforts for waste heat recovery and insulation (boiler waste heat recovery, recovery of drain and blow-off water, and insulation on walls) 5. Introduction of natural refrigerant, installation of high-efficiency freezers (greater chlorofluorocarbon elimination, energy savings, and air conditioning efficiency) 6. Installation of high-efficiency lighting fixtures (energy savings) 7. Promotion of environmental management (promotion of activities related to ISO 14001 and sharing of outcomes) 8. Reduced waste through improved yield (energy savings) 9. Installation of inverters and introduction of unit control (energy savings through optimized automatic operations) 10. Reduced use of combustion improver for incinerators (reduced waste and increased percentage of flammable waste)
Japan Copper and Brass Association	<ol style="list-style-type: none"> 1. Promotion of activities for all business facilities <ol style="list-style-type: none"> a) Installation of energy-saving lighting fixtures (with inverters) b) Change to energy-saving air conditioners 2. Installation, replacement, and improvement of facilities and equipment <ol style="list-style-type: none"> a) Fuel conversion b) Replacement of mercury lamps with LED or metal halide lamps c) Improved prevention of air leakage 3. Improvements in process and operational control, and in operations management <ol style="list-style-type: none"> a) Reduction of standby electricity b) Reduction of transformers through load adjustment c) Centralized monitoring of electricity d) Establishment of an automatic power-factor regulation system e) Reductions made to peak electricity use f) Prevention of no-load operation of drawing facilities g) Reduction of maintenance electricity through the consolidation and stopping of furnaces
The Japan Society of Industrial Machinery Manufacturers	<ol style="list-style-type: none"> 1. Transfer to machinery with inverters 2. Efficient operations through the unit control and consolidated control of compressors 3. Replacement of transformer facilities 4. Switch to high-efficiency lighting 5. Reduction of test operation time 6. Regular checking of pressurized air leakage 7. Implementation of Cool Biz and Warm Biz programs 8. Other daily energy-saving activities 9. Efficient operation of air conditioning facilities and their replacement

	10. Facility investments accompanied by fuel conversion
The Japan Bearing Industrial Association	<ol style="list-style-type: none"> 1. Efficiency of motors increased, inverters installed in motors 2. Measures to prevent air leakage and to reduce air pressure for compressors 3. Fuel conversion and use of waste heat for heat treatment facilities 4. Installation of air conditioners using ice-based thermal energy storage, installation of gas heat pumps 5. Installation of high-efficiency lighting fixtures 6. Practice of turning off lights implemented
Japan Sugar Refiners' Association	<ol style="list-style-type: none"> 1. Fuel conversion (higher ratio of city gas usage) 2. Installation of auto-vapor recompression concentrators 3. Installation of vacuum crystallizers with agitators 4. Installation of vacuum crystallizers with automated boiling 5. Installation of cogeneration facilities 6. Installation of steam accumulators 7. Rotational control through inverters adopted for motors 8. Recovery of boiler waste heat 9. Upgrades to turbo compressors 10. Conversion to energy-saving transformers 11. Conversion to absorption air conditioners 12. Conversion to vacuum circuit breakers 13. Insulation of steam pipes 14. Promotion of production rationalization to increase the operating rate
Japan Sanitary Equipment Industry Association	<ol style="list-style-type: none"> 1. Promotion of fuel conversion 2. Installation of cogeneration systems 3. Installation of evaporative radiator cooling equipment 4. Installation of energy-saving inverter equipment 5. Reduction of the weight of furnace carts 6. Increased production efficiency and improvement of the reject rate 7. Promotion of the use of solar power and other natural energy sources 8. Higher energy-saving awareness at the individual level and programs to accumulate small energy-saving actions 9. Temperature control of air conditioners, diligent practice of turning off lights
Japan Soft Drink Association	<ol style="list-style-type: none"> 1. Use of cogeneration facilities 2. Improved boiler operation (optimization of settings for unit control, combustion switching, local air supply pressure, etc.; and replacement of burners for fire-tube boilers with high-efficiency ones when converting fuel) 3. Increased water supply temperatures through the use of continued blow-off water from once-through boilers (latent heat) 4. Change in incinerator fuel 5. Compressors (unit control, new installation of inverter-controlled compressors) 6. Installation of high-efficiency air diffusers for aeration tanks at wastewater treatment facilities

	<ul style="list-style-type: none"> 7. Installation of inverters in deep-well water pumps 8. Use as fuel of biogas recovered from wastewater anaerobic treatment facilities
Limestone Association of Japan	<ul style="list-style-type: none"> 1. Reduced consumption of fuel (diesel fuel) <ul style="list-style-type: none"> a) Upsizing and optimizing heavy machinery in use b) Reorganization of transportation routes and the shortening of traveled distances c) Strict enforcement of inspections and maintenance d) Promotion of energy-saving operation 2. Promotion of the acquisition of heavy machinery with environmentally compatible engines 3. Reduction of electricity consumption (promoting the spread of energy-saving facilities, optimizing production processes) 4. Promotion of the installation of cogeneration systems 5. Promotion of energy-saving activities
Japan Machine Tool Builder's Association	<ul style="list-style-type: none"> 1. Air-conditioning-related <ul style="list-style-type: none"> a) Inverters installed in air conditioners and heat source pumps b) Production adjustments 2. Lighting-related <ul style="list-style-type: none"> a) Switch to metal halide and other high-efficiency lighting b) Installation of electrical power saving systems c) Thorough practice of turning off unneeded lights 3. Compressor-related <ul style="list-style-type: none"> a) Installation of inverters b) Unit control c) Reduction of air supply pressure d) Prevention of air leakage 4. Machining processes <ul style="list-style-type: none"> a) Installation of inverters b) Switching off electricity to non-operating facilities c) Production adjustments
Flour Millers Association	<ul style="list-style-type: none"> 1. Consolidation and increased operation of mills 2. Installation of cogeneration systems 3. Installation of high-efficiency motors, fans, and transformers 4. Installation of high-efficiency blowers and rotation control devices 5. Installation of compressor pressure optimization systems and unit control systems
The Shipbuilders' Association of Japan and the Cooperative Association of Japan Shipbuilders	<ul style="list-style-type: none"> 1. Promotion of more efficient and advanced production by encouraging investments in automated facilities 2. Installation of solar power generators
Japan Industrial Vehicles Association	<ul style="list-style-type: none"> 1. Improvements to production facilities and processes 2. Promotion of conversion to fuel with a low carbon emission factor 3. Energy-saving renovations to factory facilities (lighting, air conditioning)
Japan Association of	<ul style="list-style-type: none"> 1. Measures related to energy-saving facilities

Rolling Stock Industries	<ul style="list-style-type: none"> a) Replacement of production facilities b) Installation of energy-saving production facilities c) Replacement of mercury lamps with fluorescent lamps (for ceiling lighting at plants) d) Partial use of LED lamps for ceiling lighting <p>2. Measures related to high-efficiency facilities</p> <ul style="list-style-type: none"> a) Installation of inverters in hydraulic pumps for processing facilities b) Upgrading to compressors with inverters c) Upgrading to low-loss transformers d) Replacement of air conditioning equipment <p>3. Measures related to fuel conversion</p> <ul style="list-style-type: none"> a) Change of burner fuel from fuel oil to propane b) Change of hot water boiler fuel from kerosene to city gas <p>4. Operational improvements</p> <ul style="list-style-type: none"> a) Reduced use of electricity, fuel, gas, and water b) Changes to air conditioner temperature settings c) Reduced use of chemicals
Japan Petroleum Development Association	<ul style="list-style-type: none"> 1. Consolidation and rationalization of inefficient facilities 2. Installation of energy-saving facilities and machinery at production plants, rationalization of systems 3. Increased efficiency of operations (reduction of internal consumption of natural gas) 4. Effective use of unused low-pressure gas 5. Burning of diffused natural gas 6. Installation of environmental management systems 7. Implementation of energy-saving programs at business offices 8. Use of natural-gas-powered vehicles 9. Installation of cogeneration systems 10. Installation of fuel cells at production plants

2. Commercial and Other Sectors

Industry	Examples of efforts made
Japan Association of Refrigerated Warehouses	<ul style="list-style-type: none"> 1. Shift to or introduction of energy-saving facilities and technologies <ul style="list-style-type: none"> a) High-efficiency transformers b) High-efficiency compressors c) Devices to shut out outside air d) Energy-saving lighting fixtures e) Use of closed-deck platforms f) Increased use of insulation, etc. 2. Prevention of energy waste through day-to-day maintenance <ul style="list-style-type: none"> a) Maintenance of warehouse temperatures that are appropriate for the goods stored b) Strict enforcement of cleaning of condensers c) Preventing cool air from leaking out of insulated doors, etc. 3. Use of energy-saving manuals, formulation of energy management standards, and management of energy use

Japan LP Gas Association	<ol style="list-style-type: none"> 1. Consolidation of three import bases 2. Consolidation of 45 secondary bases
The Real Estate Companies Association of Japan	<ol style="list-style-type: none"> 1. Reduction of CO₂ and other emissions related to the design, etc., of buildings (new office buildings) <ol style="list-style-type: none"> a) Promotion of energy-saving and CO₂ emission reduction measures for buildings to be renovated or built (promotion of the use of designs and devices that help save energy and reduce CO₂ emissions) b) Selection of construction materials and air-conditioning systems with the view of reduction of hydrofluorocarbons, etc. c) Effective use of energy at local levels and utilization of unused energy (consideration toward realizing efficient energy management at local levels, and active utilization of unused energy [kitchen waste and other biomass resources, waste heat from waste incineration plants and substations, and temperature differences in the ocean, rivers, and sewage]) d) Effective use of renewable energy (promotion of the use of solar and other renewable energy sources in areas to be developed) 2. Reduction of CO₂ and other emissions related to the use of buildings owned by member companies (head office buildings) <ol style="list-style-type: none"> a) Promotion of energy-saving activities that can be carried out on a day-to-day basis (improved corporate organization to address environmental issues, installation of energy-saving equipment, and implementation of energy-saving measures in the company and within the framework of daily operations) b) Implementation of energy-saving measures for common use spaces (machine rooms, lobbies, and corridors) such as measurement and management of energy use (use of tools to manage energy intensity, introduction of building and energy management systems [BEMS], etc.), and considering efficient operations of facilities and equipment and energy-saving investments c) Implementation of energy-saving measures for spaces used by tenants (spaces rented) such as activities to raise environmental awareness among tenants, creation of systems to assist and coordinate with energy-saving activities by tenants, and provision of information to tenants (data on the use of light, heating, and water by tenants that help encourage their energy-saving activities; know-how and information concerning daily energy-saving activities; etc.) d) Creation of systems to cooperate with other industry organizations and strengthening of coordination (active use of energy-saving analysis, consulting, and ESCO services)
The Life Insurance Association of Japan	<ol style="list-style-type: none"> 1. Reduction of electricity use through power-saving campaigns and installation of power-saving equipment 2. Reduction of other energy use 3. Increased utilization rate of recycled paper 4. Recycling of resources through thorough separate collection of waste 5. Improved awareness of environmental issues through in-house education

	<p>programs for executives and employees on environmental conservation</p> <p>6. Further promotion of environmental efforts through sharing good examples of efforts made by member companies</p> <p>7. Publication on the association's website of environmental efforts being made by the industry as a whole and by member companies</p>
<p>The General Insurance Association of Japan</p>	<ol style="list-style-type: none"> 1. Further reduction of energy and resource consumption <ol style="list-style-type: none"> a) Further reduction in the use of paper resources b) Reduced use of energy resources such as electricity and gas at offices c) Promotion of the use of low-emission vehicles as company cars 2. In-house training and education <ol style="list-style-type: none"> a) In-house education on environmental conservation, including new-hire training and training according to ranks of employees b) Improved corporate organization to support employee participation in volunteer environmental activities, etc. 3. Creation of environmental management and audit systems 4. Reduction of environmental burdens through collaboration with other companies and organizations 5. Dissemination of information to the public <ol style="list-style-type: none"> a) Holding of seminars and public lectures on the environment b) Publication of magazines and books on the environment c) Provision of consulting 6. Efforts through the general insurance business <ol style="list-style-type: none"> a) Development and diffusion of insurance products that help address environmental issues and provision of relevant services b) Education on the Eco-Safe Driving techniques c) Promotion of the use of recycled parts
<p>Nippon Telegraph and Telephone Corporation (NTT)</p>	<ol style="list-style-type: none"> 1. Total Power Revolution power-saving campaign <ol style="list-style-type: none"> a) Installation of information and communication technology (ICT) devices with high energy-saving performance (formulation of the NTT Group's guidelines on energy-saving performance) b) Promotion of energy management for around 4,000 buildings owned by the NTT Group across Japan c) Installation of energy-efficient power equipment and air conditioners d) Promotion of electricity consumption reduction through the use of direct-current power supply for servers, routers, and other Internet Protocol (IP) devices e) Installation of solar, wind, and other clean energy systems 2. Strengthening of measures to reduce electricity use at offices <ol style="list-style-type: none"> a) Promotion of visualization of electricity use at offices b) Reduction of electricity use for air conditioning through making use of Cool Biz and Warm Biz programs c) Reduction of electricity use for lighting by installing energy-saving fluorescent lamps and LED lamps and by managing the time of use 3. Promotion of driving company cars in an environmentally friendly way and of introducing low-pollution vehicles 4. Research and development in the fields of energy saving and clean

	<p>energy</p> <ul style="list-style-type: none"> a) Development of technologies to reduce electricity use for telecommunication facilities, including communication devices and air conditioning facilities b) Reduction of electricity use through greater network efficiency achieved by such measures as shared optical fiber and signal multiplexing c) Scaling down of ICT resources through the use of such technologies as cloud computing and virtualization for servers, etc. <p>5. Promotion of a modal shift through unified management of logistics</p>
KDDI Corporation	<ul style="list-style-type: none"> 1. Promotion of environmental activities through expansion and renewal of ISO 14001 certification (energy-saving activities at offices and other places of business) 2. Compliance with the Act on the Rational Use of Energy <ul style="list-style-type: none"> a) Installation of energy-saving facilities at 32 designated energy management places of business (deployment and operational management of energy-saving devices, such as upgrading to high-efficiency air conditioning systems, installation of inverters and motion sensors in lighting fixtures, renovation of cold water pumps and freezers, and use of solar control window films) 3. Installation of energy-saving equipment at mobile communication base stations across the country, such as inverters in air conditioners, switch to heat exchangers, and lightning prevention devices for high-efficiency power supply systems
Japan Foreign Trade Council, Inc.	<ul style="list-style-type: none"> 1. Installation of energy-saving equipment <ul style="list-style-type: none"> a) Introduction of energy-saving office equipment b) Introduction of energy-saving vending machines c) Introduction of motion sensors in corridors and restrooms 2. Thorough management of energy use <ul style="list-style-type: none"> a) Turning off lights during lunch breaks b) Reduction of the number of lights used c) Management of temperature settings and operation hours of air conditioners d) Energy-saving settings for PCs and copy machines e) Having guards on patrol check whether lights are turned off f) Implementation of “no overtime day” g) Management of energy use by location h) Reduction of the number of elevators used i) Management of operation hours for water heaters, tea dispensers, and vending machines 3. Promotion of education activities <ul style="list-style-type: none"> a) Strict enforcement of turning off lights when unused b) Strict enforcement of switching off and unplugging office equipment when unused c) Encouraging employees to set their PCs to energy-saving mode d) Use of intranets, group newsletters, posters, and e-mails to urge

	<p>employees to cooperate</p> <p>e) Encouraging employees to use stairs (limiting use of elevators)</p> <p>f) Promotion of the reduction of overtime and weekend work</p> <p>g) Encouraging employees to adjust blinds</p>
Japanese Bankers Association	<ol style="list-style-type: none"> 1. Efficient use of resources <ol style="list-style-type: none"> a) Promotion of paperless work b) Reduction of electricity use through promotion of energy saving 2. Helping create a recycling society <ol style="list-style-type: none"> a) Promotion of the use of recycled paper for letter paper for internal use, memo pads, business cards, copier paper, etc. b) Separate collection of waste paper 3. Education and raising awareness <ol style="list-style-type: none"> a) Promotion of in-house education b) Holding of lectures on environmental issues for member banks 4. Activities to make contributions to society 5. Development of services in response to clients' higher environmental awareness 6. Provision of information on the environment to clients
Japan Federation of Printing Industries	<ol style="list-style-type: none"> 1. Lighting <ol style="list-style-type: none"> a) Use of LED lamps b) Use of high-frequency lamps 2. Air conditioning <ol style="list-style-type: none"> a) Replacement of air conditioners b) Installation of inverters in air conditioners 3. Power-related equipment <ol style="list-style-type: none"> a) Prevention and reduction of air leakage b) Installation of inverters in motors, etc.

3. Transportation Sector

Industry	Examples of efforts made
The Scheduled Airlines Association of Japan	<ol style="list-style-type: none"> 1. Promotion of upgrading to and introduction of new, more fuel-efficient aircrafts 2. Shortened flight routes and hours and improved flight accuracy through the use of new air traffic control support systems 3. Introduction of energy-efficient method of landing (continuous descent operation [CDO]) 4. Selection of optimum flight altitudes and speeds and the shortest flight routes in day-to-day operations 5. Improved fuel efficiency by carrying optimum amounts of fuel, reducing the weight of objects carried, curtailing the use of auxiliary power unit, reducing hours of flight training and evaluation in aircrafts through the use of simulators, reducing time for engine test runs, and washing engines at regular intervals 6. Improved performance through renovation of aircraft equipment 7. Implementation of demonstration flights using biofuel
Japan Federation of	<ol style="list-style-type: none"> 1. Measures on ships and equipment

Coastal Shipping Associations	<ul style="list-style-type: none"> a) Use of larger types of ships b) Introduction of new types of ships c) Adoption of energy-efficient devices and equipment d) Development of energy-efficient designs for ships <ul style="list-style-type: none"> 2. Measures concerning operations <ul style="list-style-type: none"> a) Improved transport efficiency b) Energy-saving diagnosis for individual ships c) Selection of optimal transportation routes
All Japan Freight Forwarders Association	<ul style="list-style-type: none"> 1. Assistance for the introduction of low-pollution vehicles (vehicles that meet emission standards and compressed natural gas [CNG] vehicles) 2. Promotion of switching to larger vehicles
The Association of Japanese Private Railways	<ul style="list-style-type: none"> 1. Promotion of the introduction of energy-saving railcars when increasing the number of or replacing vehicles 2. Appropriate train operations according to demand through adoption of train schedules for Saturdays, Sundays, and holidays

(Attachment 4)

Results of Efforts Related to Offices and Other Operational Units

Industry	Electricity/energy consumption	CO ₂ emission reductions	CO ₂ emissions per unit of floor area
The Federation of Electric Power Companies of Japan	FY 2000: 1.08 bil. kWh → FY 2010: 0.91 bil. kWh	80,000 t-CO ₂	
Petroleum Association of Japan	FY 2007: 146,223 GJ → FY 2010: 109,965 GJ	2,600 t-CO ₂	FY 2007: 62.6 kg/m ² → FY 2010: 48.0 kg/m ²
The Japan Iron and Steel Federation	FY 2003–2005 (average): 692 TJ → FY 2010: 606 TJ	8,500 t-CO ₂	FY 2003–2005 (average) 41 kg/m ² → FY 2010: 33 kg/m ²
Japan Paper Association	FY 2009: 509 TJ → FY 2010: 507 TJ	10,000 t-CO ₂	FY 2009: 43 kg/m ² → FY 2010: 39 kg/m ²
Japan Automobile Manufacturers Association and Japan Auto-Body Industries Association	FY 2005: 25,300 kl → FY 2010: 22,400 kl	12,300 t-CO ₂	FY 2005: 90.9 kg/m ² → FY 2010: 64.3 kg/m ²
Japan Auto Parts Industries Association	FY 2006: 337.3 MJ → FY 2010: 330.4 MJ	1,600 t-CO ₂	FY 2006: 77.1 kg/m ² → FY 2010: 76.6 kg/m ²
Japan Mining Industry Association			FY 2007: 0.0812 t/m ² → FY 2010: 0.0577 t/m ²
Lime Manufacture Association			FY 2007: 51.3 kg/m ² → FY 2010: 43.9 kg/m ²
The Federation of Pharmaceutical Manufacturers' Associations of Japan and Japan Pharmaceutical Manufacturers			FY 2006: 74.8 kg/m ² → FY 2010: 64.8 kg/m ²

Association			
Flat Glass Manufacturers Association of Japan	FY 2007: 18,962,553 MJ → FY 2010: 14,151,900 MJ	379 t-CO ₂	FY 2007: 84.97 kg/m ² → FY 2010: 61.74 kg/m ²
The Japanese Electric Wire & Cable Makers' Association			FY 2005: 0.0535 t/m ² → FY 2010: 0.0424 t/m ²
Japan Dairy Industry Association			FY 2007: 0.102 kg/m ² → FY 2010: 0.096 kg/m ²
Japan Copper and Brass Association	FY 2005: 510 kl → FY 2010: 220 kl	650 t-CO ₂	FY 2005: 0.105 t/m ² → FY 2010: 0.039 t/m ²
The Japan Society of Industrial Machinery Manufacturers	FY 2009: approx. 119 mil. kWh → FY 2010: approx. 117 mil. kWh	700 t-CO ₂	
The Japan Bearing Industrial Association			FY 2005: 52.8 kg/m ² → FY 2010: 41.4 kg/m ²
Japan Sugar Refiners' Association			FY 2006: 79.2 kg/m ² → FY 2010: 68.4 kg/m ²
Japan Soft Drink Association	FY 2009: 5,600 kl → FY 2010: 5,400 kl	400 t-CO ₂	FY 2009: 63.2 kg/m ² → FY 2010: 55.3 kg/m ²
Limestone Association of Japan			FY 2006: 113.6 kg/m ² → FY 2010: 65.7 kg/m ²
Japan Machine Tool Builder's Association	FY 2007: 145,000 GJ → FY 2010: 112,000 GJ	2,300 t-CO ₂	FY 2007: 0.1 t/m ² → FY 2010: 0.05 t/m ²
Flour Millers Association			FY 2008: 43.2 kg/m ² → FY 2010: 40.8 kg/m ²
The Shipbuilders' Association of Japan and the Cooperative Association of	FY 2006: 4,600 kl → FY 2010: 3,400 kl	5,300 t-CO ₂	FY 2006: 148.7 kg/m ² → FY 2010: 96.3 kg/m ²

Japan Shipbuilders *1			
Japan LP Gas Association			FY 2006: 53 kg/m ² → FY 2010: 50 kg/m ²
The Life Insurance Association of Japan	FY 2000: 155.87 mil. kWh → FY 2010: 119.09 mil. kWh		FY 2000: 274.2 kWh/m ² → FY 2010: 181.5 kWh/m ²
The General Insurance Association of Japan	FY 2006: 802,745,512 MJ → FY 2010: 703,899,374 MJ	7,700 t-CO ₂	FY 2006: 65.9 kg/m ² → FY 2010: 61.4 kg/m ²
Japan Foreign Trade Council, Inc.	FY 2005: 27,000 kl → FY 2010: 25,000 kl	11,000 t-CO ₂	FY 2005: 58.1 kg/m ² → FY 2010: 42.1 kg/m ²
Japanese Bankers Association	FY 2000: 378,000 kl → FY 2010: 309,000 kl	115,000 t-CO ₂	
The Association of Japanese Private Railways			FY 2008: 73.1 kg/m ² → FY 2010: 71.5 kg/m ²

*1 The figures in the table do not include the results of efforts made by the Cooperative Association of Japan Shipbuilders.

(Attachment 5)

Results of Efforts Related to Distribution Operations

Industry	Energy consumption	CO ₂ emission reductions	CO ₂ emissions per unit of cargo transported	Energy consumption per unit of cargo transported
The Federation of Electric Power Companies of Japan	FY 2000: 32,000 kl → FY 2010: 28,000 kl	6,600 t-CO ₂		
Petroleum Association of Japan	FY 2009: 397,000 kl → FY 2010: 396,000 kl			
The Japan Gas Association	FY 2003: 189 TJ → FY 2010: 172 TJ	1,200 t-CO ₂		
The Japan Iron and Steel Federation			FY 2005: 65 kg / 1,000 t-km → FY 2010: 44 kg / 1,000 t-km	
Japan Chemical Industry Association			FY 2005: 116 t/t-km → FY 2010: 66 t/t-km	
Japan Paper Association	FY 2009: 8,330 TJ → FY 2010: 8,091 TJ	16,000 t-CO ₂		FY 2009: 0.80 MJ/t-km → FY 2010: 0.78 MJ/t-km
Japan Cement Association			Tankers: Emissions in FY 2010 represented a 4.1% reduction compared to FY 2000. Bulk cement trucks: Emissions in FY 2010 represented a 7.7% reduction compared to FY 2000.	
Japan Automobile Manufacturers Association and Japan Auto-Body Industries			FY 2006: 0.120 t/t-km → FY 2010: 0.107 t/t-km	

Association				
Japan Auto Parts Industries Association	FY 2006: 30.8 MJ → FY 2010: 20.6 MJ	27,400 t-CO ₂	FY 2006: 135.9 kg/t-km → FY 2010: 120.3 kg/t-km	
Flat Glass Manufacturers Association of Japan	FY 2007: 787,972,707 MJ → FY 2010: 528, 882, 543 MJ	17,600 t-CO ₂		
Japan Copper and Brass Association	FY 2005: 830 kl → FY 2010: 720 kl	310 t-CO ₂	FY 2005: 0.17 kg/t-km → FY 2010: 0.13 kg/t-km	FY 2005: 0.06 l/t-km → FY 2010: 0.05 l/t-km
Japan Soft Drink Association			FY 2009: 0.0562 kg/t-km → FY 2010: 0.0525 kg/t-km	
Japan LP Gas Association	FY 2006: 1,696,560,000 MJ → FY 2010: 1,072,012,000 MJ		FY 2006: 0.08 kg/t-km → FY 2010: 0.07 kg/t-km	

International Comparison of Energy Efficiency in Participating Industries

○ Electric Power (Federation of Electric Power Companies)

Fossil-fired power generation efficiency (electric power output per unit of energy input) (2008)

Japan	U.K.	France	Nordic countries	Germany	U.S.A.	China	India
100	96	102	104	106	112	128	136

Source: ECOFYS, "International Comparison of Fossil Power Efficiency," 2011.

The lower the number, the larger the amount of electricity produced per unit of energy input.

Comparison of CO₂ emissions intensity for the electric power industry ("generating-end")(2009)

Japan	France	Canada	Italy	U.K.	Germany	U.S.A.	China	India
100	23	44	110	115	121	133	205	249

Source: IEA, "Energy Balances of OECD Countries 2010" and "Energy Balances of Non-OECD Countries 2011."

CO₂ emission intensity is low in France because 80% of its electric power is produced through nuclear power generation and is low for Canada because 60% of its electric power comes from hydroelectric power generation.

○ Oil (Petroleum Association of Japan)

Energy consumption index of refineries (2004)

Japan	Advanced Asian countries (excluding China)	Western Europe	U.S.A. and Canada
100	101	103	113

Source: Data from the results of a survey by Solomon Associates Ltd.

This is a comparison of "energy intensity index," which is Solomon Associates' proprietary benchmarking method. The index is based on throughput equivalents, which is similar in nature to the index used by the oil industry in its voluntary action plan (energy consumption intensity at oil refineries). A lower number indicates higher efficiency.

○ Iron and Steel (Japan Iron and Steel Federation)

Energy efficiency of Steel Industries (2005)

Japan	South Korea	Germany	U.K.	U.S.A.	China	India	Russia
100	102	112	122	130	123	125	143

Source: Research Institute for Innovative Technology for the Earth (RITE) "International Comparison of Energy Efficiency (Power Generation, Steel, and Cement)", October 2009. Japan Iron and Steel Federation indexed the original figures.

○ Chemicals (Japan Chemical Industry Association)

Electric power consumed in relation to production of electrolytic caustic soda (2009)

Japan	South Korea	China	Canada	Middle East	India	U.S.A.	Western Europe	Eastern Europe	Mexico
100	100	103	105	107	109	109	111	112	118

Source: CMAI, "Capacity Database 2009"; and Japan Soda Industry Association, "Soda Gijutsu Handobukku 2009" (Soda Technology Handbook 2009).

○ Paper (Japan Paper Association)

Total energy efficiency for paper and paperboard produced (2004-2005)

Japan	Finland	Germany	France	Norway	Brazil	U.S.A.	Chile
100	115	116	145	154	155	194	246

Source: Institute of Energy Economics, Japan, "Research Paper for Technological Measures of Manufacturers in 2007: The Production and Energy Consumption of Pulp, Paper, and Paperboard Industries of Countries," 2007.

Since Germany relies largely on recycled pulp and imported pulp, its energy consumption related to pulp production is low. In addition, demand for quality such as whiteness of toilet paper is relatively low in Germany, which can also be considered a factor contributing to low energy consumption.

○ Cement (Cement Association of Japan)

Energy consumption per clinker ton (2003)

Japan	Germany	India	Brazil	Korea	U.S.A.	China
100	116	124	132	133	155	159

Source: International Energy Agency (IEA), Worldwide Trends in Energy Use and Efficiency 2008.

○ Mining (Japan Mining Industry Association)

Energy efficiency of copper refineries (2000)

Japan	Europe	Asia	North America	South America
100	133	143	154	202

Source: Sample data collected through interviews by Japan Mining Industry Association.
Comparison is of energy efficiency (MJ/ton) of copper refineries

○ Aluminum (Japan Aluminum Association)

Energy consumption in the plate rolling process (2000)

Japan	Global
100	127

Source: International Aluminium Institute and Life Cycle Assessment Society of Japan's Database (2006).

(Attachment 7)

Evaluation Committee for the Voluntary Action Plan on the Environment

1. Establishment July 23, 2002

2. Objectives

- (1) To confirm that follow-up surveys for the Voluntary Action Plan on the Environment (Measures against Global Warming) are performed properly and to evaluate their transparency and credibility from an independent standpoint.
- (2) To identify areas for improvement regarding the follow-up surveys for the Keidanren Voluntary Action Plan on the Environment (Measures against Global Warming), so as to contribute to further improving transparency and credibility.

3. Results of activities

The evaluation of the past nine follow-up surveys (fiscal 2002–2010) was conducted from the following perspectives.

- (1) To assess whether the processes for the collection, aggregation and reporting of data by the industries participating in the follow-up surveys, and the aggregation of the data reported by the participating industries, were implemented properly.
- (2) With respect to the follow-up system as a whole, to identify aspects that should be improved in order to increase transparency and credibility.

A Voluntary Action Plan Evaluation Report was prepared and released to the public nine times.

4. Members of the Evaluation Committee (as of December 13, 2011)

Chairman: Yoji Uchiyama (Professor, Graduate School of Systems and Information Engineering, Institute of Engineering Mechanics and Systems, University of Tsukuba)

Members: Tadashi Aoyagi (Former Senior Research Fellow, Mitsubishi Research Institute)
Kiyoe Asada (President, Women's Energy Network)
Kazuya Koujitani (Secretary-General, Green Purchasing Network)
Masaki Mashita (Advisor, Japan Forestry Association)
Ryuji Matsuhashi (Professor, Department of Environment Systems, Graduate School of Frontier Sciences, The University of Tokyo)
Kanji Yoshioka (Professor Economics, Keio Economic Observatory, Keio University)

Reference: The Formulation of the Voluntary Action Plan on the Environment: History and Aims

1. History

A step ahead of the Earth Summit in 1992, Keidanren formulated the Keidanren Global Environment Charter in 1991. Guided by a basic philosophy that the addressing of environmental problems is essential to corporate existence and activity, it proclaimed a course of voluntary and active efforts directed at environmental conservation.

In order to link the philosophy of the Global Environment Charter to concrete action, in 1996 the Keidanren Appeal on the Environment was announced. With respect to measures to counter global warming, Keidanren then announced the formulation of a voluntary action plan to promote practical and effective efforts by the business community.

This led to the formulation of the Keidanren Voluntary Action Plan on the Environment (renamed the Voluntary Action Plan on the Environment in fiscal 2002) in the following year, 1997. Today, 61 industrial organizations and companies are participating in the plan, through which they are actively addressing not only global warming but also the problem of waste. With respect to measures to counter global warming, the uniform goal is the “reduction of CO₂ emissions from participating industries in the industrial and energy-conversion sectors in fiscal 2010 to below the levels of fiscal 1990.” Since the Voluntary Action Plan on the Environment was adopted before the Kyoto Protocol (in June 1997), its target year differed from the Kyoto Protocol’s five-year commitment period of fiscal 2008 to fiscal 2012. In view of this situation, to further contribute to Japan’s achievement of its commitments under the Kyoto Protocol, Keidanren modified the goal in 2006, stating that “the target level is to be achieved as an average in the five years of the Kyoto Protocol commitment period.”

2. Goals

The causes of long-term environmental problems that occur globally, such as global warming, are to be found in business activities of all kinds and in many aspects of our daily lives. In consequence, they cannot be addressed by restricting activities uniformly, and it is also difficult to deal with them adequately through conventional means such as regulations and the levying of taxes and charges. In view of this, in place of the conventional regulatory measures that have been effective in the past, such as the anti-pollution measures of the 1970s, today it is to voluntary efforts that we must look to have an impact on problems occurring on a global scale. The rationale underlying voluntary efforts is that they constitute the most effective countermeasures, because business people themselves, who have the best grasp of the actual situation in each industry, can take technical trends and other factors affecting management judgments comprehensively into consideration, and draft and implement the most cost-effective measures. Keidanren conducts a follow-up every year of the state of progress of the Voluntary Action Plan on the Environment, and releases its finding publicly through the Internet and other means.

Therefore, the Voluntary Action Plan on the Environment comprises four steps that are repeated each year: (1) the setting of targets; (2) the implementation of efforts to attain those targets; (3) the regular follow-up of the state of progress of those efforts; and (4) the public disclosure of the follow-up results through the Internet and other means. This mechanism spurs continuous improvements, and is able to prevent the non-achievement of targets.

The Japanese government's Kyoto Protocol Target Achievement Plan, which was approved by the Cabinet in April 2005 and revised in March 2008, positioned the Keidanren Voluntary Action Plan on the Environment as the plan that will play a central role in industry efforts toward the achievement of targets. It praised the Voluntary Action Plan stating that the merits of voluntary approaches is that they do not involve procedural costs and each entity can develop its own outstanding measures through original and innovative efforts. The hope that companies will take further advantage of these merits in their own voluntary action plans was also expressed.

The progress of the voluntary action plans is reviewed annually by the relevant government councils, and reports are also made to joint meetings of the councils concerned with domestic measures to address global warming.

3. Future Policy

Keidanren will continue to require the participating industries to ensure the steady implementation of the plan's countermeasures, and to devote its full energies to the achievement of its overall uniform goals. It will also maintain its efforts to ensure a continuous improvement in transparency and credibility on the basis of the reports of the Evaluation Committee for the Voluntary Action Plan on the Environment.

For their part, companies will expedite their voluntary efforts, not only undertaking measures relating to their own business activities, but also contributing to problem-resolution both within Japan as a whole and globally.

Addendum: Measures toward the Formation of a Recycling Society

When the Keidanren Voluntary Action Plan on the Environment was formulated in 1997, waste-related measures were included as another core component. Targets were laid down for individual industries, and with the view of promoting those measures in a responsible manner, follow-up surveys of the state of progress towards achieving targets are conducted annually. In fiscal 1999, "reduction of the final disposal volume of industrial waste by 75% in fiscal 2010 compared to fiscal 1990" was established as an industry-wide target. This target was achieved early in fiscal 2002 and in each of the years that followed. Therefore, in fiscal 2006, the Section on Waste Products was changed to the Section on the Formation of a Recycling Society, and the target was increased to "reduction of the final disposal volume of industrial waste by 86% in fiscal

2010 compared to fiscal 1990.” This second target was achieved ahead of schedule in fiscal 2008, and the target was met again in fiscal 2009.

In December 2010, Keidanren set a new target for “reduction of the final disposal volume of industrial waste by around 65% in fiscal 2015 compared to fiscal 2000.” From fiscal 2011 onward, the business community will make further efforts to reduce the final disposal volume of industrial waste as well as to promote the three Rs (reduce, reuse, and recycle) toward the formation of a recycling society.