

**Results of the Fiscal 2007 Follow-up
to the Keidanren Voluntary Action Plan on the Environment (Summary)
—Section on Global Warming Measures—
< Performance in Fiscal 2006 >**

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Nippon Keidanren (Japan Business Federation)

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1. CO₂ emissions in fiscal 2006 by industry as a whole (comprising the industrial and energy-conversion sectors)

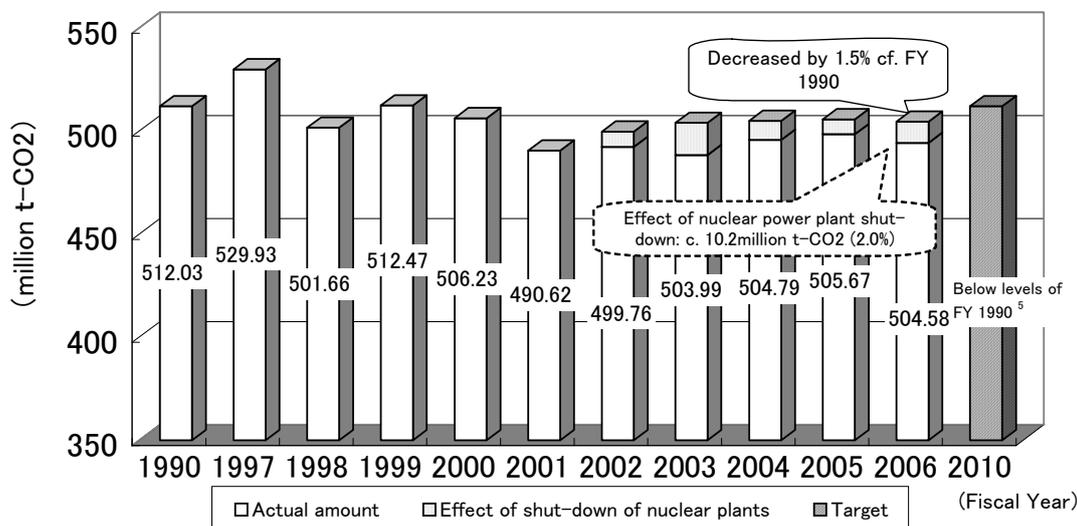
Under the philosophy that “positive involvement in environmental issues is essential to the survival of companies as well as their activities,” Japan Business Federation declared prior to the adoption of the Kyoto Protocol that it will “endeavor to reduce CO₂ emissions from the industrial and energy-conversion sectors in fiscal 2010 to below the levels of fiscal 1990.” Since then, participating industries and companies have continued to strive to achieve this target. Since the Keidanren Voluntary Action Plan on the Environment was established before the Kyoto Protocol, target periods differ between the Voluntary Action Plan and the Kyoto Protocol, which specifies the five years between fiscal 2008 and 2012 as the first commitment period. Therefore, to contribute further to the achievement of Japan’s Kyoto Protocol commitments, in 2007 Japan Business Federation established that target levels be achieved as a five-year average corresponding to the first commitment period of the Kyoto Protocol.

The 35 industries¹ in the industrial and energy-conversion sectors that participated in the Fiscal 2007 Follow-up together emitted 512.03 million t-CO₂² in fiscal 1990, the base year. This accounts for approximately 45% of Japan’s total emissions of 1,144.20 million t-CO₂ for that year. Moreover, the emissions of the 35 industries represented approximately 84% of the total amount of CO₂ emitted by the country’s industrial and energy-conversion sectors in fiscal 1990 (612.32 million t-CO₂³).

Results of the Fiscal 2007 Follow-up indicate that CO₂ emissions in fiscal 2006 were 504.58 million t-CO₂, representing a 1.5% decrease compared to fiscal 1990 and a 0.2% decrease compared to fiscal 2005, making this the seventh consecutive year since fiscal 2000 that the target level has been achieved.

If the effect of the worsening of the CO₂ emission intensity of electricity resulting from the long-term shut-down of some nuclear power plants is excluded, CO₂ emissions in fiscal 2006 can be estimated at approximately 494.40 million t-CO₂, a decrease of around 3.5% compared to fiscal 1990.

CO₂ Emissions by 35 Industries in the Industrial and Energy-conversion Sectors⁴



2. Trends by industry

Of the 35 industries in the industrial and energy-conversion sectors that participated in the Fiscal 2007 Follow-up, 20 reported declines in CO₂ emissions compared to fiscal 1990, while 21 reported declines compared to fiscal 2005.

Of the 15 industries that defined their goals in terms of reductions of CO₂ emissions, 12 reported reductions compared to fiscal 1990 and 9 reported reductions compared to fiscal 2005.⁶ In the calculation of CO₂ emissions related to electricity consumed, some industries have changed to a different method than the basic method used by Japan Business Federation. How this should be treated will be examined in the future.

Four of the five industries that defined their goals in terms of reduction of energy consumption reported reductions compared to fiscal 1990; none reported reductions compared to fiscal 2005.⁶

Of the 22 industries that defined their goals in terms of either CO₂ emission intensity or energy intensity, 17 reported improvements in their indices compared to fiscal 1990, and 18 industries showed improvements in these indices compared to fiscal 2005 (see Attachment 1).⁶

3. Evaluation of Voluntary Action Plan Achievements

(1) Reasons for the variations in CO₂ emissions in the industrial and energy-conversion sectors

An analysis of the reasons for the 1.5% decrease in CO₂ emissions by the 35 industries in fiscal 2006 compared to fiscal 1990 is provided in the table below. Production activities increased by 11.9% and the CO₂ emission coefficient increased by 0.1%. However, the effect of the 13.5% reduction in emissions per unit of production more than compensated for the upward pressure on emissions. This indicates that due to the success of energy-saving and other CO₂ emission reduction measures by the industries and companies the Voluntary Action Plan is producing steady results.

An analysis of factors compared to fiscal 2005 shows an increase in production resulting from Japan's economic recovery, but participating industries and companies further reducing CO₂ emissions per unit of production in fiscal 2006 enabled overall CO₂ emissions in the industrial and energy-conversion sectors to decrease 0.2% from the previous year.

Reference: Analysis of Changes in CO₂ Emissions by the Industrial and Energy-conversion Sectors in Fiscal 2006

	Cf. fiscal 1990	Cf. fiscal 2005
Change in production* ¹	+11.9%	+2.3%
Change in CO ₂ emissions per production	+ 0.1%	-0.3%
Change in CO ₂ coefficient* ²	-13.5%	-2.2%
Total	-1.5%	-0.2%

*¹ For changes in production, the indices with the closest relation to energy consumption in each industry were selected. The changes in production of the 35 participating industries in the industrial and energy-conversion sectors are weighted averages applying the indices of each industry to CO₂ emissions.

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

✂The effect of the shut-down of some nuclear power plants

In fiscal 2006 some nuclear power plants remained shut down. The use of thermal power generation to compensate for the amount of electricity generation lost as a result

and maintain a stable supply of electricity, the CO₂ emission intensity worsened.

If calculations were made using the CO₂ emission intensity for electricity premised on there being no effect of long-term nuclear power shutdowns, based on estimates of the Federation of Electric Power Companies of Japan (3.29 t-CO₂/10,000 kWh for all electricity sources at electricity generating ends), CO₂ emissions of the 35 participating industries would decrease by about 10.20 million t-CO₂ (approximately 2.0%).

(2) Situation for setting higher targets by industry

Now that 10 years have passed since the establishment of the Keidanren Voluntary Action Plan on the Environment, it would be desirable to set higher targets in industries that have achieved greater reductions than initially forecasted. In the Fiscal 2007 Follow-up, Japan Business Federation called for the active examination of upwardly revising industry targets based on the probability of achieving current targets. As a result, 17 industry groups in the industrial and energy-conversion sectors increased target levels (Petroleum Association of Japan, the Japan Gas Association, Japan Chemical Industry Association, Japan Paper Association, Japan Cement Association, four electrical/electronics-related groups, Japan Automobile Manufacturers Association, Japan Federation of Housing Organizations, Japan Mining Industry Association, Lime Manufacture Association, the Japan Rubber Manufacturers Association, Flat Glass Manufacturers Association of Japan, Japan Aluminum Association, the Japanese Electric Wire & Cable Makers' Association, Japan Copper and Brass Association, Japan Sugar Refiners' Association, and Japan Sanitary Equipment Industry Association). In addition, two industry groups increased target levels in the commercial sector (Japan Foreign Trade Council, Inc., and Japan Department Stores Association) and four industry groups in the transportation sector (the Scheduled Airlines Association of Japan, the Japanese Shipowners' Association, Japan Trucking Association, and All Japan Freight Forwarders Association) (Attachment 3).

The growing movement among industry groups nearing the achievement of current targets to set higher targets for ongoing efforts to improve energy efficiency spotlights the advantage of Voluntary Action Plans in addressing climate change that cannot be matched by tax or regulatory measures.

(3) Estimate for the achievement of fiscal 2008 to 2012 targets

Calculations based on estimates by seven industry groups (the Federation of Electric Power Companies of Japan, Petroleum Association of Japan, the Japan Iron and Steel Federation, Japan Chemical Industry Association, Japan Paper Association, Japan Cement Association, and four electrical/electronics-related groups), which account for 90% of the total CO₂ emissions by the industries in the industrial and energy-conversion sectors, found average forecasted CO₂ emissions between fiscal 2008 and 2012 of the 35 industries in the industrial and energy-conversion sectors to be 2.9% below the fiscal 1990 level.

By continuing to strengthen the measures based on the Voluntary Action Plan, the common goal set for all industry in the Voluntary Action Plan of reducing CO₂ emissions to below the 1990 level can be achieved.

Reference: Estimate of Fiscal 2008 to 2012 CO₂ Emissions by the Industrial and Energy-conversion Sectors

	Fiscal 1990 actual	Fiscal 2008 to 2012 estimate
7 major industries	450.11 million t-CO ₂	444.19 million t-CO ₂
(Percentage of total fiscal 2006 emissions)	—	(89.3%)
35 industry total	512.03 million t-CO ₂	497.37 million t-CO ₂
Cf. to fiscal 1990	—	2.9% decrease from fiscal 1990
Production amount*	—	13.0% increase from fiscal 1990

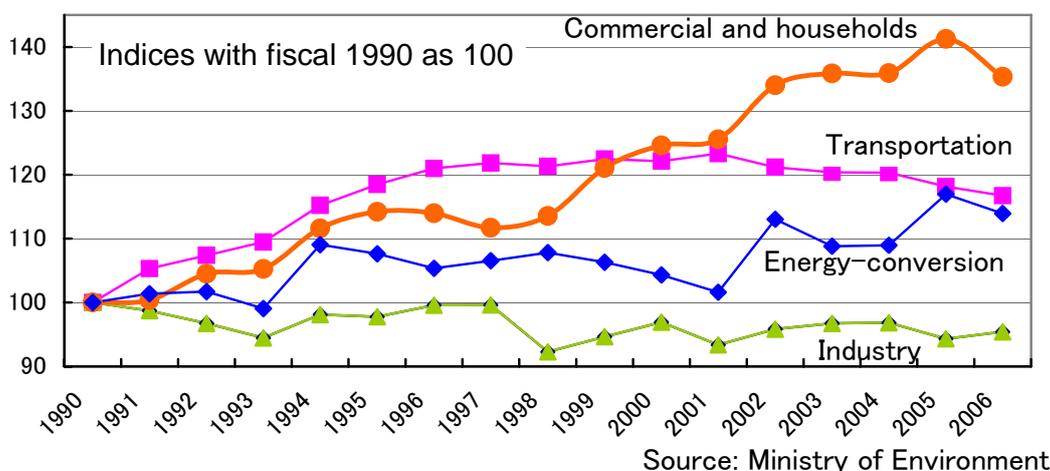
* The amount of change in the total production amount is the weighted average in relation to the size of the CO₂ emissions based on estimates by each industry for production amount in fiscal 2008 to 2012.

4. Efforts by industries in the commercial and transportation sectors to reduce CO₂ emissions

An examination of the trends in Japan's total CO₂ emissions reveals that based on the preliminary figures for fiscal 2006, emissions from energy consumption increased by 11.8% compared to fiscal 1990 (an increase of 6.4% for all greenhouse gases including methane and alternatives to chlorofluorocarbons [CFCs]). A breakdown of CO₂

emissions by sector shows that emissions from the industrial sector was reduced by 5.6%, but emissions from the commercial sector increased a substantial 36.8% compared to fiscal 1990. It will become increasingly important for industry to liaise and cooperate with administrative agencies, local authorities, labor unions, non-governmental organizations, and other entities to conduct various activities in unison.

Reference: Japan's CO₂ Emissions from Energy Consumption by Sector



※CO₂ emission from electric power generation is reallocated to each sector due to its consumption

Japanese industry has supported the efforts of the commercial and transportation sectors to fight climate change by developing and providing various services and disseminating energy-saving products that meet “Top Runner” standards. Japan Business Federation is determined to continue contributing to Japan’s achievement of its commitments under the Kyoto Protocol by stepping up efforts in both of these sectors to take advantage of the technological capabilities and creative ingenuity of Japanese companies in carrying out its Voluntary Action Plan on the Environment.

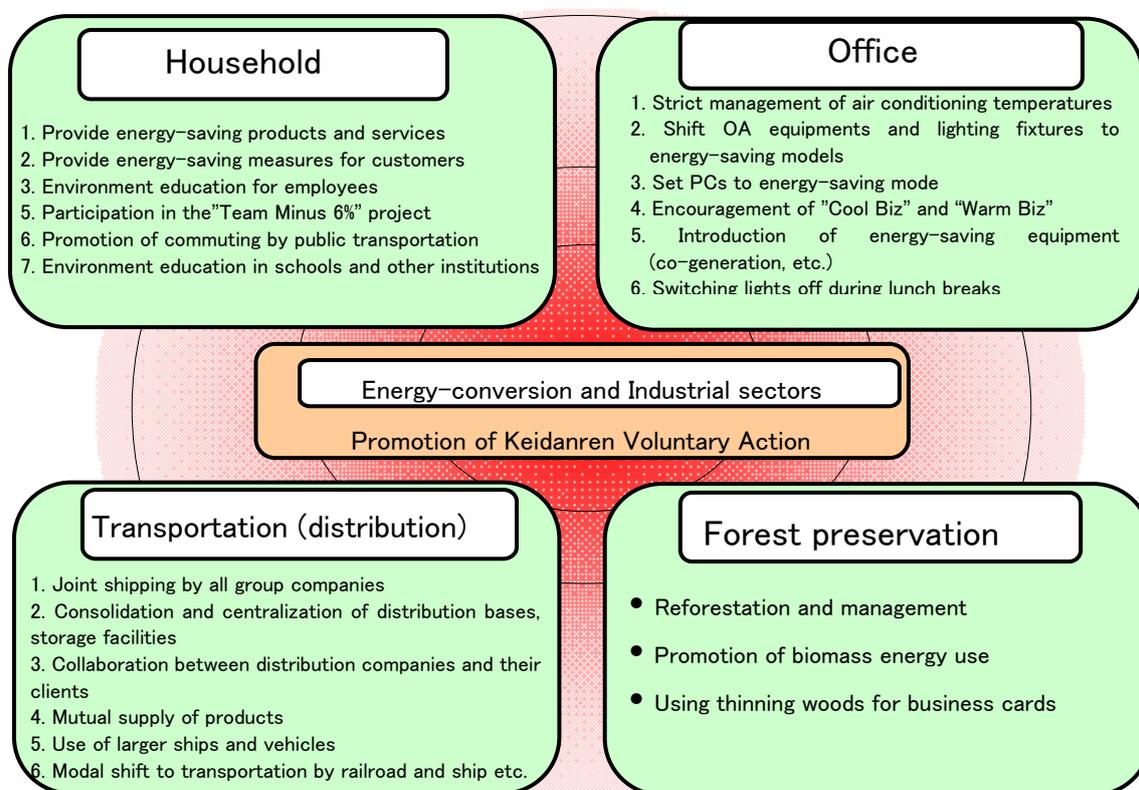
These efforts are already spreading from manufacturing to distribution operations and offices and are developing into nationwide efforts through employee activities. It will be important for more companies to expand their activities aimed at preventing climate change by sharing and effectively using the experiences and results of broad-ranged efforts made to date to fight climate change. From this perspective, Japan Business Federation compiled the *Fiscal 2006 Report on Global Warming Prevention Measures: 900 Hints on Reducing CO₂ Emissions** in April 2007 and is now making efforts to

disseminate the information to member companies. A revision of the report is planned in the near future.

* For detailed information on efforts by member companies, please refer to the *Fiscal 2006 Report on Global Warming Prevention Measures: 900 Hints on Reducing CO₂ Emissions*, which is available at the following URL (in Japanese):

<http://www.keidanren.or.jp/japanese/policy/2007/029.html>.

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



(1) Efforts by industries in the commercial and transportation sectors

In the Fiscal 2007 Follow-up, one company (KDDI Corporation) newly participated in addition to the 12 associations and companies from the commercial sector that took part in the previous year. Along with 13 industrial associations and companies from the transportation sector, they have formulated their own voluntary action plans and have taken steps to deal with climate change (see Attachment 2).⁸ Some of the participating

industries and companies have set specific quantitative targets for fiscal 2008 to 2012, such as those for CO₂ emissions or CO₂ emission intensity.

(2) Efforts related to offices and other operational units

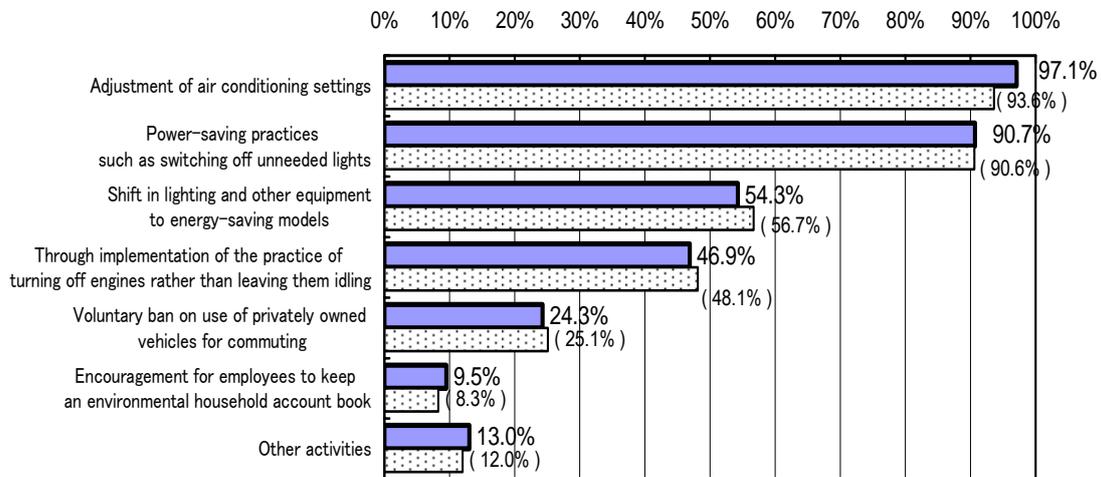
All participating industry groups are engaged in a variety of energy conservation measures in their offices. In a questionnaire survey carried out by Japan Business Federation in August 2007,⁹ more than 90% of the 483 responding companies reported committed efforts to the “Strict management of air conditioning temperatures” (97%) and to “Switching off lights and taking other measures to save electricity” (93%) and a broadening of efforts toward “Shifting to energy-saving equipment” (62%), “No engine idling for company vehicles” (52%), and “Voluntary ban on use of privately owned vehicles for commuting” (33%). Clearly, daily efforts to reduce energy use have become widespread in offices. With regard to energy conservation activities for office buildings, about 60% of companies have established numerical targets, and about half of the companies without numerical targets (about 20% of the total responding companies) are considering the establishment of numerical targets.

Reference: Examples of Participating Industries’ Measures to Fight Climate Change in Offices

- Strict management of air conditioning temperatures, efficient operation of air conditioning, frequent adjustments of temperature settings
- Switching off lights during lunch breaks or using only every other light, splitting up of lighting circuits, using elevators less
- Introduction of energy-saving equipment (co-generation, thermal storage HVAC systems, solar power generation systems, etc.)
- Shift in OA equipment, lighting fixtures, etc. to energy-saving models
- Introduction of insulated glass and light-filtering glass, adhesion of light-filtering film to glass
- Use of services provided by Energy Service Companies (ESCO), etc.

(*) Survey by Nippon Keidanren (Conducted in August 2006; responses from 514 member companies)

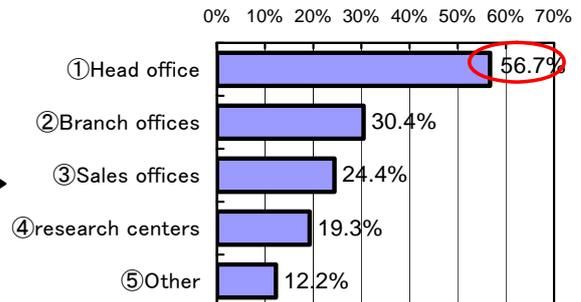
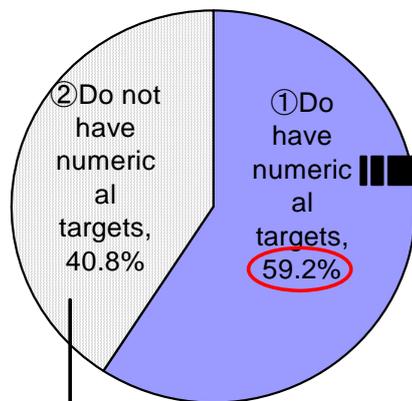
(Upper bar: fiscal 2006; lower bar: fiscal 2005)



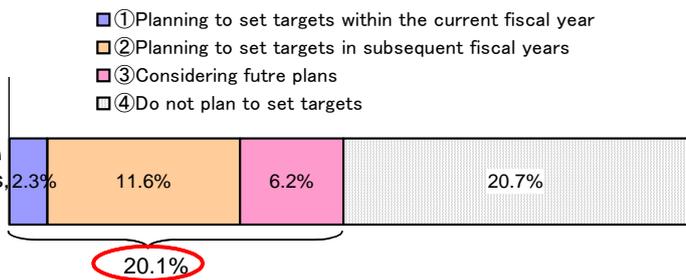
2. Numerical Targets for Energy Conservation Programs in Offices

(1) Have you set numerical targets for energy conservation programs at the head office or branch offices (including leased offices)?

(2) If you have set numerical targets, how widely do they apply? (Multiple answers possible)



(3) If you have not set numerical targets, do you have future plans to do so?



(3) Efforts related to distribution operations

As a measure targeting motor vehicles in relation to the reduction of emissions in distribution operations, the world's highest level of fuel efficiency technology is being applied to achieve further improvements in fuel efficiency. In addition, the reduction of emissions is steadily progressing through such efforts as consolidating distribution bases and increasing the efficiency of distribution through collaboration between distribution companies and their clients.

Reference: Examples of Participating Industries' Measures to Fight Climate Change in Distribution Operations

- Use of joint shipping by group companies, joint shipping to the same destination
- Consolidation and centralization of distribution bases, storage facilities of raw materials and products, and other relevant sites
- Collaboration between distribution companies and their clients
- Mutual supply of products
- Introduction of fuel-efficient cars, electric cars, natural gas cars, energy-saving vehicles, etc.
- Use of larger ships and vehicles
- Modal shift to transportation by railroad and ship
- Encouragement of fuel-efficient driving, such as the practice of no engine idling, reduction of fast take-offs and accelerations, etc.
- Direct delivery to customers
- Reduction in the weight and volume of cargo for transport by reducing product weight and reviewing packaging

(4) Efforts from the life-cycle assessment perspective

Companies are contributing indirectly to the reduction of greenhouse gas emissions by providing energy-saving products and services. It is noteworthy that multifaceted efforts are being made, such as (1) promotion of energy-saving measures based on evaluations from a life-cycle assessment (LCA) perspective, (2) expanded use, as raw materials and sources of heat energy, of wastes that were considered to be worthless, and (3) steady progress in ESCO operations that make comprehensive use of the energy-saving

know-how and technologies that companies possess.

Reference: Examples of Measures from the LCA Perspective, Such As Contributions Made through Products and Services, etc.

Products	Overview	CO ₂ reduction	
Appliances	Provide energy-efficient appliances that exceed the standards set by the Top Runner Program		
	Products	Target of energy efficiency improvement	Actual performance (energy-efficiency improvement)
	TV	16.4% (FY1997→FY2003)	25.7%
	VCR	58.7% (FY1997→FY2003)	73.6%
	Air conditioner	66.1% (FY1997→FY2004)	67.8%
	Refrigerators	30.5% (FY1998→FY2004)	55.2%
	Freezers	22.9% (FY1998→FY2004)	29.6%
High-performance steel	More energy is used in production process compared to ordinary steel, but the steel saves energy when used in a machine	FY2004 About 7.86 million t-CO ₂ /yr	
Fuel-efficient automobile	Make efforts to launch the automobiles that meet the Top Runner Program target of 2010; 86% share in domestic market by 2005 and 100% by 2007	FY2010 About 22.58 million t-CO ₂	
Biomass fuel for automobiles	20% of the domestic demands of gasoline will be bio-ethanol mixed one as ETBE (ethyl tertiary butyl ether).	FY2010 Reduction of about 210,000 kl per year (crude oil equivalent)	
High-efficiency boiler (“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	Cumulative CO ₂ reductions by fiscal 2006: about	

	energy. Presently 0.83M installed (2006) and the target for fiscal 2010 is 5.2M installation by 2010.	0.60 Mt-CO ₂ . FY2010 (target); 4.00 Mt-CO ₂
Double glazed windows and plastic sashes	The combined use of plastic window frames and double-glazed glass, with air space between two glass panes, improves the thermal insulation capacity of windows. (This type of product can help reduce air conditioning costs by about 40% compared with conventional products.)	If the product is used in about 30 million homes, CO ₂ emissions will be reduced by 28.00 Mt-CO ₂
High-performance residential heat insulation material	Thermal insulation is improved by using foamed plastic insulation materials made by creating tiny air bubbles in plastic. (This type of product can help reduce air conditioning costs by about 30% compared with conventional products.)	If the product is used in about 30 million homes, CO ₂ emissions will be reduced by 21.00 Mt-CO ₂

(5) Efforts to support nationwide efforts and forest management activities

At present, Japanese consumers are not making maximum use of energy-saving products and services.¹⁰ It is essential that each individual acts with a keen awareness of the problem of climate change on a daily basis and changes his or her lifestyle in an effort to solve it. To this end, it is necessary to change people's attitudes and behavior so that they will use more energy-saving products and environment-friendly goods and services by stepping up nationwide efforts, introducing daylight savings time in Japan, and other means. Many companies are making active efforts that would lead to nationwide efforts, such as providing information on energy conservation to customers through their websites and the hosting of events, as well as offering environment education to their employees. (See chart on the next page)

Along with strengthened measures to increase the energy efficiency of offices, stores, and other commercial operations and in distribution operations, Japan Business Federation is also calling for strengthened measures that will help expand nationwide energy conservation efforts, such as through business leaders taking the lead in promoting casual summertime dress ("Cool Biz"), the active use of highly energy-efficient equipment, and encouraging employees to keep environmental household account books.¹¹ The percentage of companies implementing Cool Biz

programs expanded from 85% in 2005 to 93% in 2006 and 96% or nearly all the companies in 2007. In addition, the percentage of companies supporting “Team Minus 6%,” a government-led project to achieve Japan’s greenhouse gas reduction target of 6% from 1990 levels by 2012, rose from 68% in 2006 to 75% in 2007.¹¹ It is hoped that this project will take root. Moreover, the percentage of companies encouraging employees to keep environmental household account books increased sharply from 9% in 2006 to 16% in 2007. By promoting employees’ understanding of environmental problems at the individual and household level, it is hoped that this will lead to the implementation of specific energy conservation actions.

Reference: Examples of Participating Industries’ Measures to Promote Nationwide Energy Conservation Efforts

Measures taken	Reporting industries		
	2005	2006	2007
Provision of energy-saving information to customers through company websites, the hosting of events, and other means	13	19	25
Environmental education for employees by supplying environmental household account books and providing other programs	16	28	31
Implementation of “Cool Biz” and participation in the “Team Minus 6%” project (not only at the company level but also at the individual employee level)	20	44	50
Implementation of environment education in schools and other institutions	10	19	22
Afforestation programs and afforestation fund-raising activities	13	25	32
Encouragement of the use of public transportation for commuting	3	3	4

In addition, an increasing number of initiatives to protect forests and secure absorbers of CO₂ are being reported. These include the expansion of the use of domestic lumber, such as timber from thinning, improvement in the conditions of company-owned forests, and the promotion of afforestation projects in Japan and abroad. In such ways, industry’s voluntary efforts to prevent climate change are spreading to various sectors.

Reference: Examples of Measures to Protect Forests and CO₂ Absorbers

(1) Domestic

- Use of domestic timber from thinning for cushioning materials, business cards, brochures, CSR reports, etc.
- Maintenance and development of company-owned forests and implementation of educational activities for employees and local communities
- Participation in forest ownership programs
- Participation in volunteer activities to protect forests hosted by local governments and companies (tree planting, thinning, and undergrowth clearing)

(2) Overseas

- Promotion of overseas afforestation projects, such as in China, Southeast Asia (mangroves), Brazil, Ecuador (reforestation to preserve biodiversity), and New Zealand
- Overseas afforestation activities through donations to NGOs
- Participation in desert greening projects in China
- Participation in experimental rainforest restoration projects in Malaysia, Brazil, and other countries

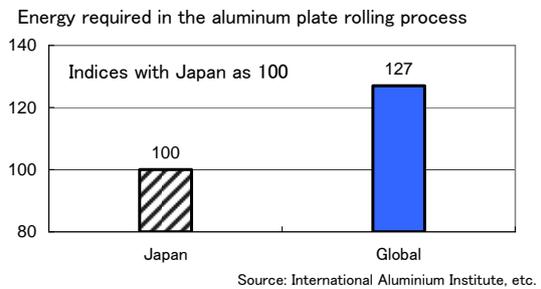
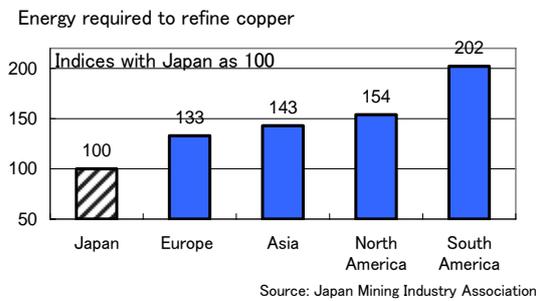
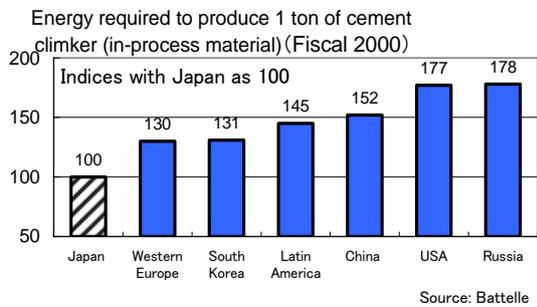
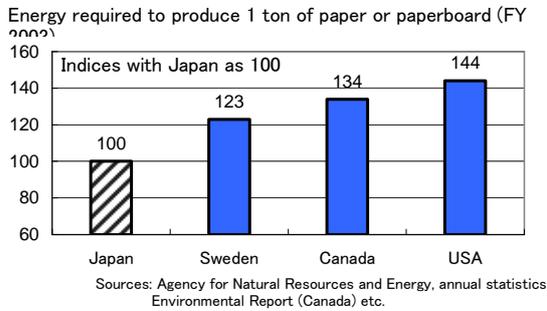
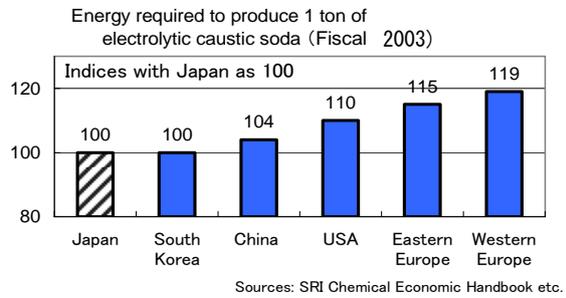
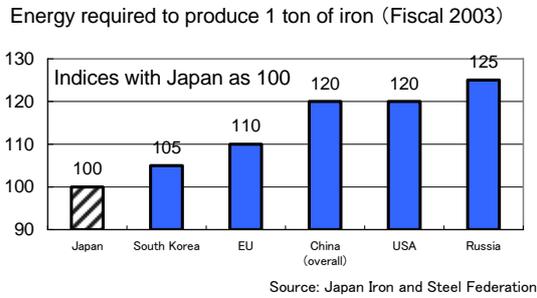
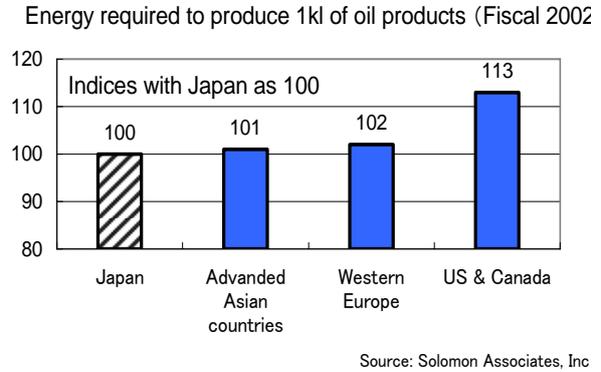
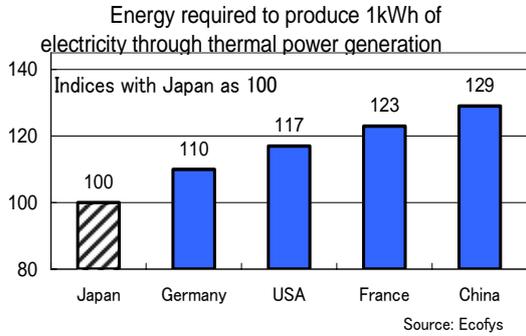
5. Efforts to make international contributions utilizing the technological capabilities of Japanese industry

(1) International comparison of energy efficiency

Japanese industry has been a forerunner in promoting energy conservation, launching efforts in the 1970s following the oil shocks. According to the international comparison of energy efficiency conducted by participating industries as part of the Fiscal 2007 Follow-up, world-leading levels of energy efficiency have been achieved again in all participating industries that carried out comparisons (see chart below and Attachment 4).

It is vital that Japanese companies proceed with the overseas transfer of their advanced energy-saving and alternative energy technologies and contribute to the reduction of greenhouse gas emissions on a global scale.

Reference: International Comparison of Energy Efficiency in Industrial and Energy-conversion Sectors



(2) Operations to reduce greenhouse gases overseas based on the Kyoto Mechanisms

Following on 2006, in the Fiscal 2007 Follow-up, many cases of specific voluntary operations including fossil fuel alternative energy projects 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 are making financial contributions to domestic and international funds such as the Japan GHG Reduction Fund and the World Bank.

When the achievement of the targets of industry groups' voluntary action plans is difficult by domestic efforts alone, the industry groups may still utilize such supplementary means of the Kyoto Mechanisms as the Clean Development Mechanism (CDM) and Joint Implementation (JI) to achieve their goals. Such active acquisition of carbon credits by companies not only helps to prevent climate change but increases the probability of achieving the overall targets of voluntary action plans.

Since the current Kyoto Protocol does not accurately reflect past energy conservation achievements in establishing emission reduction obligations, it is possible to say that Japan's companies, while achieving world-leading levels of energy efficiency, are compelled to make massive financial contributions to utilize the Kyoto Mechanisms.

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

Industry	Project outline	Credits earned (estimate)
The Federation of Electric Power Companies of Japan	<ul style="list-style-type: none">• Project to renovate a hydroelectric power plant in Vietnam• Biomass power generation project in Honduras• Project to burn methane gas recovered from the excrement generated by Chilean pig farms• Participation in various carbon funds (Total contributions of about ¥28.5 billion)	For the industry overall, around 120.00 M t-CO ₂ by 2012

The Japan Iron and Steel Federation	<ul style="list-style-type: none"> • Shandong Dongyue HFC decomposition project in China • Introduction of a waste heat recovery system at a Qian'an coke plant in China • Waste heat recovery project for cooling systems in the Philippines • Participation in various carbon funds 	<ul style="list-style-type: none"> • 44.00 M t-CO₂ (annual average of 8.80 M t-CO₂)
Petroleum Association of Japan	<ul style="list-style-type: none"> • Operations in Vietnam to capture and utilize the 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 M t-CO₂ per year • 0.66 M t-CO₂ per year
Japan Soft Drink Association	<ul style="list-style-type: none"> • Participation in various carbon funds 	<ul style="list-style-type: none"> • 0.76 M 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 • Participation in various carbon funds 	<ul style="list-style-type: none"> • About 40.00 M t-CO₂ over 7 years • 3.07 M t-CO₂
Japan Foreign Trade Council, Inc.	<ul style="list-style-type: none"> • Wuxi landfill gas recovery and power generation project in China • Biogas project at a starch manufacturing plant in Thailand • Project to burn methane gas recovered from Indonesian pig farms 	<ul style="list-style-type: none"> • 0.75 M t-CO₂ over 10 years • 0.564 M t-CO₂ per year
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 Japan Gas Association	<ul style="list-style-type: none"> • Participation in various carbon funds 	<ul style="list-style-type: none"> • 1.70 M t-CO₂

6. Disclosure of environmental information

In addition to steadily advancing industry's environment-related efforts by quantifying environmental issues to the largest extent possible and following them up with quantitative figures, it is important to actively disclose environment-related information to gain the understanding of diverse stakeholders. As Japan Business Federation believes that the Voluntary Action Plan should go hand in hand with the promotion of the voluntary disclosure of information on environmental activities, it encourages its members to further disclose information on their environmental activities through such means as the publication of environmental reports.

According to a survey conducted by Japan Business Federation of its member companies in August 2007,⁹ 316 companies, or about 65% of the 483 responding companies, had already released environmental reports or other relevant documents, and 60 companies, or about 12%, were planning to issue such a report within two years. About 60% of the companies that had issued environmental reports had issued them in at least one foreign language. This illustrates that companies are taking a proactive approach to providing information both domestically and internationally.

Looking at the areas covered in the environmental reports, nearly all companies issuing reports included the following topics: "Measures to fight climate change" (98%); "Waste management and recycling" (99%); and "Philanthropy programs" (96%). After these topics, the next two most common were "Chemical substance management" (77%) and "Environmental accounting" (77%). With respect to the measures to fight climate change in particular, many companies made efforts to disclose information on their activities by reporting on the following items: "Company-wide emissions of greenhouse gases (or CO₂)" (84%); "Voluntary reduction targets for greenhouse gas emissions" (73%); "Efforts to reduce greenhouse gas emissions from distribution and commercial operations" (72%); "Environmental education for employees and other activities" (70%); and "Introduction of energy-saving products" (65%).

7. Future policies

In February 2005 the Kyoto Protocol came into force, and in April that year the Cabinet approved the Kyoto Protocol Target Achievement Plan. This Plan states that "the advantages of these voluntary methods include the fact that they enable each entity to

use its originality and ingenuity to select outstanding countermeasures, and that they involve no procedural costs. It is hoped that these advantages will be further enhanced in voluntary action plans by businesses.” In the Plan, the Keidanren Voluntary Action Plan on the Environment is stated to be the action plan that will play a central role in the industrial and energy-conversion sectors’ efforts toward the achievement of targets.

While calling on participating industries to remain committed to efforts to achieve their individual goals, Japan Business Federation will work toward achieving the common goal for all industries, 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.”

In fiscal 2002 Japan Business Federation established the Evaluation Committee for the Voluntary Action Plan on the Environment consisting of outside experts to enhance the transparency and credibility of follow-up surveys. It is receiving evaluations in order to enable the industries to continue their measures within the framework of the Voluntary Action Plan over the medium and long terms (see Attachment 5). In light of the points made by the Evaluation Committee, Japan Business Federation focused on the following areas in the Fiscal 2007 Follow-up: verification of the possibility of achieving the common goal between fiscal 2008 and 2012; planned utilization of the Kyoto Mechanisms; and enhanced information disclosure, such as the initiatives taken in the commercial and transportation sectors. Japan Business Federation will maintain its efforts to ensure the achievement of the goal by enhancing its Voluntary Action Plan as well as by addressing the matters pointed out by the Evaluation Committee.

At the same time, Japan Business Federation will continue to pursue the following specific initiatives in the commercial and transportation sectors: (1) development and diffusion of energy-saving products and services; (2) establishment of numerical targets and the increase of target levels for energy-saving activities at the head office and other office buildings, (3) deployment of outstanding CO₂ emissions reduction examples in the commercial and transportation sectors; (4) improvement in distribution efficiency through cross-industry collaboration such as that between distribution companies and their clients; (5) support for energy-saving activities by employees in their homes; and (6) promotion of forest management activities.

Climate change is a problem that must be addressed on a global scale, and long-term

efforts are critical for its solution. Regarding a post-2012 international framework on climate change, the G8 Summit Heiligendamm of June 2007 and the Major Economies Meeting on Energy Security and Climate Change hosted by the United States in September 2007 both affirmed a policy of major emitters agreeing to such a framework by the end of 2009. A post-2012 framework will also be debated at such international gatherings as the 13th session of the Conference of Parties of the UNFCCC in December 2007 and at the G8 Hokkaido Toyako Summit in July 2008.

Japan Business Federation released on October 16, 2007, a more detailed proposal on the post-2012 international framework from the perspective of reflecting the views of Japanese industry in future international negotiations and in the efforts of the Japanese government. This proposal calls for the participation of all major emitters including the United States, China, and India and emphasizes the importance of utilizing technology. The proposal offers a scenario of arresting the increase of greenhouse gases through the participation of all major emitters and through the progress of country measures in the short and medium term and of dramatically reducing greenhouse gases over the long term through the development and spread of innovative technologies. Specifically, under the proposed framework each country will establish country energy efficiency targets and regulatory and tax provisions for their achievement, consider a sectoral approaches where improvements in energy efficiency are sought on a sectoral basis, and commit to its own measures for addressing climate change and check their progress. The proposal also underscores the importance of financial and technical aid for developing nations and measures on developing innovative technologies.

Under the post-2012 international framework, Japan Business Federation will continue to work actively to tackle climate change using the Voluntary Action Plan as a basic framework. More specifically, with the view of contributing to Japanese society and the global community, we will promote efforts in the medium term to (1) maintain and improve energy efficiency levels that are among the world's highest, (2) reduce emissions through inter-industry partnerships and through products, (3) reduce emissions in the commercial and transportation sectors, and (4) contribute to emissions reduction at the global level. In the longer term, we will promote efforts to (5) develop innovative technologies and examine the nature of international partnerships to achieve these ends. Also, we will work to encourage similar voluntary actions by the world's business community.

1. The following are the 35 participating industry groups in the industrial and energy-conversion sectors: Flat Glass Manufacturers Association of Japan; Japan Federation of Housing Organizations; 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 Civil Engineering Contractors' Association, and Building Contractors Society; 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.

2. When electric power input per unit output is used to calculate emissions for industry as a whole, Japan Business Federation uses the following data (for all power sources at generating ends) provided by the Federation of Electric Power Companies. When not otherwise specified, electric power input per unit output cited by the respective industries is also based on data provided by the Federation of Electric Power Companies.

(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 2010: 2.97; FY 2010 (BAU): 3.68 [t-CO₂/10,000 kWh]).

Other conversion coefficients for energy: With respect to 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 coefficients for periods prior to FY 2000 differ from those between FY 2000 and FY 2004 and after FY 2004. For carbon conversion coefficients, Keidanren uses documents issued in 2006 by the Ministry of the Environment’s research panel on the calculation of greenhouse gas emissions.

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

4. Industries review actual and forecasted figures on CO₂ emissions each year with the aim of improving the accuracy of such figures. Therefore, different numbers may appear from those cited in the previous year.

5. BAU (Business As Usual): the amount of CO₂ emissions in FY 2010, assuming that the Voluntary Action Plan is not executed from FY 2007 on. This is estimated as an increase of approximately 9.20 million t-CO₂ compared to 1990.

6. The goals of the Japan Gas Association and the Japan Auto Parts Industries Association, which define their targets in terms of CO₂ emissions and CO₂ emission intensity; the Lime Manufacture Association and the Flat Glass Manufacturers Association of Japan, which define their targets in terms of CO₂ emissions and energy consumption; the Japan Rubber Manufacturers’ Association, which defines its targets in terms of CO₂ emissions and energy consumption intensity; and the Japan Paper Association, the Japan Machine Tool Builders’ Association, and the Japan Electric Wire and Cable Makers’ Association, which define their targets in terms of energy consumption and energy consumption intensity, have been included among industries reporting improvements in each target.

7. Estimates of average production activities between FY 2008 and FY 2012 were based on common economic indicators (source: reference documents dated January 18, 2007, from a meeting of the Council on Economic and Fiscal Policy, the Cabinet Office), but some industries based their forecasts on their own assumptions.

8. The number of participating industries from the commercial sector increased to 13 with the addition of KDDI Corporation in FY 2007. The participating industry groups are: KDDI

Corporation; The Life Insurance Association of Japan; Japanese Bankers Association; 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; and NTT Group.

The participating industries from the transportation sector comprise 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.

9. Results of a survey on efforts being made in offices and the residential sector to combat climate change (October 17, 2007; 483 respondent companies).

10. On August 10, 2007, the Keizai Koho Center (Japan Institute for Social and Economic Affairs) released results of a public survey on climate change. According to this survey, with regard to expectations toward companies, "further development and commercialization of energy-saving products and appliances" received the highest response at 78%. However, only 36% said they "try to select products and services of companies that are actively addressing environmental issues," 35% said they "place more emphasis on energy efficiency than price when buying home appliances," and 27% reported they "try to buy locally when selecting food products in view of the energy used in transportation."

11. On June 1, 2007, Fujio Mitarai, Chairman of Japan Business Federation, issued a statement requiring its member companies to step up their efforts to prevent climate change by augmenting and achieving the goals of their voluntary action plans, supporting nationwide efforts on environmental issues, and actively disclosing environmental information.

Trends in Industrial and Energy-Conversion Sectors

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

Industry	(☆ : target defined in terms of this index)	Fiscal 1990	Fiscal 1997	Fiscal 1998	Fiscal 1999	Fiscal 2000	Fiscal 2001	Fiscal 2002	Fiscal 2003	Fiscal 2004	Fiscal 2005	Fiscal 2006	Compared to fiscal 1990(%)	Compared to fiscal 2005(%)
Federation of Electric Power Companies	CO ₂ emissions	27,500	29,000	28,300	30,400	31,500	31,000	34,000	36,100	36,200	37,300	36,500	+32.7%	-2.1%
	CO ₂ emissions intensity ☆	1	0.88	0.85	0.89	0.90	0.90	0.97	1.04	1.00	1.01	0.98		
	Energy consumption	10,800	11,200	10,900	11,700	12,000	11,700	12,700	13,500	13,300	13,600	13,500	+25.0%	-0.7%
	Energy consumption intensity	1	0.97	0.97	0.96	0.95	0.95	0.94	0.94	0.95	0.95	0.94		
	Production activity index	1	1.20	1.21	1.24	1.27	1.25	1.28	1.27	1.31	1.34	1.35		
Portion attributed to industry: these figures are used in the calculation of the 35-industry	CO ₂ emissions	3,070	3,350	3,220	3,340	3,410	3,340	3,700	3,860	3,830	3,850	3,700	+20.5%	-3.9%
	Energy consumption	1,210	1,300	1,240	1,280	1,300	1,260	1,380	1,440	1,410	1,410	1,370	+13.2%	-2.8%
Petroleum Association of Japan	CO ₂ emissions	3,094	4,105	4,062	4,093	4,053	4,047	4,016	4,058	4,037	4,136	4,062	+31.3%	-1.8%
	CO ₂ emissions intensity	1	0.92	0.93	0.90	0.89	0.89	0.88	0.88	0.87	0.85	0.85		
	Energy consumption	1,287	1,705	1,670	1,675	1,661	1,657	1,650	1,665	1,665	1,714	1,682	+30.8%	-1.8%
	Energy consumption intensity ☆	1	0.92	0.92	0.89	0.87	0.87	0.87	0.87	0.87	0.86	0.84	0.85	
Japan Gas Association	Production activity index	1	1.44	1.42	1.46	1.48	1.48	1.47	1.49	1.50	1.58	1.55		
	CO ₂ emissions ☆	133	107	96	92	83	72	66	58	53	47	38	-71.6%	-18.7%
	CO ₂ emissions intensity ☆	1	0.56	0.49	0.45	0.39	0.33	0.28	0.24	0.21	0.17	0.13		
	Energy consumption	66.5	55.3	50.6	48.1	43.9	38.5	34.8	29.8	28.1	24.8	21.1	-68.3%	-15.0%
Japan Iron and Steel Federation	Energy consumption intensity	1	0.58	0.52	0.47	0.41	0.36	0.30	0.25	0.22	0.18	0.14		
	Production activity index	1	1.43	1.46	1.54	1.60	1.62	1.76	1.82	1.94	2.10	2.20		
	CO ₂ emissions	20,371	20,212	19,033	19,607	18,796	18,305	18,805	19,016	19,208	19,046	19,326	-5.1%	+1.5%
	CO ₂ emissions intensity	1	0.97	0.96	0.96	0.95	0.95	0.94	0.93	0.93	0.93	0.92		
Japan Chemical Industry Association	Energy consumption ☆	6,520	6,491	6,102	6,251	6,005	5,819	5,957	6,004	6,081	6,043	6,178	-5.2%	+2.2%
	Energy consumption intensity	1	0.97	0.96	0.96	0.95	0.95	0.94	0.93	0.93	0.93	0.92		
	Production activity index	1	0.92	0.81	0.88	0.96	0.91	0.98	0.99	1.01	1.01	1.05		
	CO ₂ emissions	6,685	7,464	7,200	7,541	7,510	7,155	7,271	7,339	7,439	7,305	7,288	+9.0%	-0.2%
Japan Paper Association	CO ₂ emissions intensity	1	0.92	0.92	0.91	0.89	0.90	0.88	0.88	0.86	0.84	0.83		
	Energy consumption	2,678	3,056	2,951	3,058	2,990	2,857	2,885	2,886	2,950	2,911	2,879	+7.5%	-1.1%
	Energy consumption intensity ☆	1	0.94	0.94	0.92	0.89	0.90	0.88	0.86	0.85	0.84	0.82		
	Production activity index	1	1.21	1.17	1.24	1.26	1.19	1.23	1.25	1.29	1.30	1.31		
Cement Association of Japan	CO ₂ emissions	2,545	2,592	2,606	2,646	2,728	2,626	2,651	2,641	2,589	2,475	2,330	-8.4%	-5.9%
	CO ₂ emissions intensity ☆	1	0.95	0.98	0.96	0.96	0.99	0.97	0.97	0.95	0.89	0.84		
	Energy consumption	946	955	954	964	982	936	943	930	912	878	836	-11.6%	-4.8%
	Energy consumption intensity ☆	1	0.94	0.97	0.94	0.93	0.95	0.93	0.92	0.90	0.85	0.82		
Japan Electrical Manufacturers' Association, Japan Electronics and Information Technology Industries Association, Communications and Information network Association of Japan, Japan Business Machine and Information	Production activity index	1	1.07	1.04	1.09	1.11	1.04	1.07	1.07	1.07	1.09	1.08		
	CO ₂ emissions	2,741	2,780	2,480	2,464	2,473	2,375	2,249	2,186	2,107	2,177	2,184	-20.3%	+0.3%
	CO ₂ emissions intensity	1	1.02	1.02	1.02	1.02	1.02	1.01	1.01	1.00	1.00	1.02		
	Energy consumption	861	851	756	747	745	714	674	652	630	651	656	-23.9%	+0.7%
Japan Electrical Manufacturers' Association, Japan Electronics and Information Technology Industries Association, Communications and Information network Association of Japan, Japan Business Machine and Information	Energy consumption intensity ☆	1	0.99	0.99	0.98	0.98	0.98	0.97	0.96	0.95	0.95	0.97		
	Production activity index	1	0.99	0.89	0.88	0.88	0.85	0.81	0.79	0.77	0.79	0.78		
	CO ₂ emissions	1,112	1,302	1,247	1,307	1,382	1,328	1,453	1,699	1,732	1,807	1,846	+66.0%	+2.1%
	CO ₂ emissions intensity ☆	1	0.78	0.76	0.76	0.71	0.70	0.71	0.76	0.71	0.69	0.66		
Japan Electrical Manufacturers' Association, Japan Electronics and Information Technology Industries Association, Communications and Information network Association of Japan, Japan Business Machine and Information	Energy consumption	638	832	799	803	849	817	838	933	978	1,010	1,065	+66.9%	+5.4%
	Energy consumption intensity	1	0.87	0.85	0.82	0.76	0.75	0.72	0.72	0.70	0.67	0.66		
	Production activity index	1	1.50	1.48	1.54	1.75	1.70	1.83	2.02	2.20	2.35	2.52		

Industry	(☆ : target defined in terms of this index)	Fiscal 1990	Fiscal 1997	Fiscal 1998	Fiscal 1999	Fiscal 2000	Fiscal 2001	Fiscal 2002	Fiscal 2003	Fiscal 2004	Fiscal 2005	Fiscal 2006	Compared to fiscal 1990(%)	Compared to fiscal 2005(%)
Japan Federation of Construction Contractors	CO2 emissions	923	892	876	718	704	659	642	514	492	518	490	-46.9%	-5.3%
	CO2 emissions intensity ☆	1	0.97	0.95	0.94	0.90	0.92	0.97	0.90	0.86	0.87	0.81		
	Energy consumption	429	416	409	336	324	301	286	229	225	222	215	-49.8%	-2.9%
	Energy consumption intensity	1	0.97	0.95	0.95	0.89	0.90	0.93	0.86	0.85	0.80	0.77		
	Production activity index	1	1.00	1.00	0.82	0.85	0.78	0.72	0.62	0.62	0.64	0.65		
Japan Automobile Manufacturers Association	CO2 emissions ☆	748	695	662	641	625	576	587	571	578	575	558	-25.4%	-2.9%
	CO2 emissions intensity	1	0.97	1.00	0.99	0.92	0.83	0.77	0.75	0.74	0.68	0.61		
	Energy consumption	407	377	357	339	331	310	313	305	311	315	307	-24.6%	-2.4%
	Energy consumption intensity	1	0.97	1.00	0.98	0.91	0.82	0.76	0.74	0.73	0.68	0.62		
	Production activity index	1	0.94	0.87	0.85	0.90	0.93	1.01	1.01	1.05	1.13	1.22		
Japan Auto Parts Industries Association	CO2 emissions ☆	715	688	645	650	637	579	627	646	663	716	698	-2.4%	-2.5%
	CO2 emissions intensity	1	0.92	0.92	0.91	0.86	0.82	0.82	0.82	0.81	0.81	0.72		
	Energy consumption	375	406	390	381	361	330	340	356	352	370	373	-0.7%	+0.6%
	Energy consumption intensity	1	1.03	1.06	1.02	0.93	0.88	0.85	0.82	0.82	0.80	0.74		
	Production activity index	1	1.05	0.98	1.00	1.03	0.99	1.07	1.10	1.15	1.24	1.35		
Japan Federation of Housing Organizations	CO2 emissions ☆	538	537	508	519	497	497	487	454	447	439	441	-18.0%	+0.5%
	CO2 emissions intensity	1	1.08	1.14	1.08	1.06	1.14	1.18	1.08	1.06	1.03	1.01		
	Energy consumption	205	204	193	169	164	164	188	175	172	169	170	-16.9%	+0.5%
	Energy consumption intensity	1	1.08	1.14	0.93	0.92	0.99	1.19	1.10	1.07	1.04	1.03		
	Production activity index	1	0.92	0.83	0.89	0.87	0.81	0.77	0.78	0.78	0.79	0.81		
Japan Mining Industry Association	CO2 emissions	486	483	481	494	505	503	502	516	510	497	482	-0.8%	-3.0%
	CO2 emissions intensity	1	0.92	0.93	0.91	0.88	0.89	0.90	0.91	0.92	0.89	0.83		
	Energy consumption	205	210	213	219	220	217	215	215	216	208	206	+0.4%	-0.7%
	Energy consumption intensity ☆	1	0.95	0.97	0.95	0.91	0.91	0.91	0.90	0.92	0.88	0.84		
	Production activity index	1	1.08	1.07	1.12	1.18	1.16	1.15	1.16	1.14	1.15	1.19		
Lime Manufacture Association	CO2 emissions	354	310	272	293	301	275	292	299	300	305	312	-12.0%	+2.2%
	CO2 emissions intensity	1	0.94	0.90	0.92	0.93	0.91	0.92	0.90	0.87	0.86	0.86		
	Energy consumption ☆	121.8	108.2	95.9	103.0	104.7	95.4	99.9	100.8	101.3	104.5	107.0	-12.1%	+2.4%
	Energy consumption intensity	1	0.95	0.92	0.94	0.94	0.92	0.91	0.88	0.85	0.86	0.86		
	Production activity index	1	0.93	0.86	0.90	0.91	0.86	0.90	0.94	0.98	1.00	1.03		
The Japan Rubber Manufacturers Association	CO2 emissions ☆	190	187	184	190	185	181	195	212	216	225	212	+11.6%	-5.7%
	CO2 emissions intensity	1	0.93	0.92	0.89	0.87	0.88	0.91	0.95	0.92	0.89	0.79		
	Energy consumption	93.0	97.4	97.1	98.3	93.6	92.1	96.3	101.6	103.9	107.3	104.6	+12.5%	-2.5%
	Energy consumption intensity ☆	1	1.04	1.05	1.01	0.96	0.98	0.97	0.97	0.97	0.96	0.93		
	Production activity index	1	1.01	1.00	1.05	1.05	1.01	1.07	1.13	1.15	1.20	1.22		
used in the calculation of the 35-industry total	CO2 emissions	190	187.32	184.02	189.62	185.00	181.24	194.59	211.98	216.42	225.00	212.22	+11.6%	-5.7%
The Federation of Pharmaceutical Manufacturers' Association of Japan Japan Pharmaceutical Manufacturers Association	CO2 emissions ☆	165	194	209	221	224	223	224	231	239	236	223	+35.2%	-5.6%
	CO2 emissions intensity	1	1.01	0.93	0.95	0.91	0.83	0.81	0.83	0.81	0.77	0.70		
	Energy consumption	78.6	101.9	108.9	113.1	111.9	113.4	111.1	112.3	117.6	115.6	112.3	+42.9%	-2.9%
	Energy consumption intensity	1	1.12	1.02	1.02	0.95	0.88	0.84	0.84	0.83	0.80	0.74		
	Production activity index	1	1.16	1.36	1.42	1.50	1.63	1.67	1.69	1.80	1.85	1.94		
Flat Glass Association	CO2 emissions	178	163	145	138	134	137	132	134	134	133	136	-23.7%	+2.2%
	CO2 emissions intensity	1	1.15	1.17	1.09	1.10	1.11	1.11	0.97	0.98	1.03	1.03		
	Energy consumption ☆	71.4	65.0	58.8	55.4	53.8	55.1	52.3	52.2	52.2	51.7	53.5	-25.1%	+3.5%
	Energy consumption intensity	1	1.14	1.18	1.10	1.09	1.11	1.10	0.95	0.95	1.00	1.01		
	Production activity index	1	0.80	0.70	0.71	0.69	0.69	0.67	0.77	0.77	0.72	0.74		

Industry	(☆ : target defined in terms of this index)	Fiscal	Compared to fiscal 1990(%)	Compared to fiscal 2005(%)										
		1990	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006		
Japan Aluminum Association	CO2 emissions	148	162	152	161	163	155	161	165	164	161	154		
	CO2 emissions intensity	1	0.94	0.95	0.94	0.93	0.97	0.96	0.95	0.93	0.97	0.91		
	Energy consumption	73.4	84.5	79.8	83.1	80.8	76.8	78.4	78.6	79.1	77.3	77.2	+5.2%	-0.1%
	Energy consumption intensity ☆	0.95	0.95	0.96	0.93	0.89	0.92	0.90	0.86	0.87	0.90	0.87		
	Production activity index	1	1.16	1.08	1.15	1.18	1.08	1.13	1.18	1.18	1.12	1.14		
Brewers Association of Japan	CO2 emissions ☆	112	121	117	114	108	104	99.8	94.5	89.4	87.1	85.1	-24.4%	-2.3%
	CO2 emissions intensity	1	0.99	0.95	0.92	0.88	0.85	0.83	0.84	0.80	0.79	0.78		
	Energy consumption	53.8	60.1	60.2	58.2	54.2	53.3	49.3	45.0	43.7	42.0	41.1	-23.6%	-2.3%
	Energy consumption intensity	1	1.03	1.02	0.99	0.93	0.91	0.86	0.84	0.81	0.81	0.79		
	Production activity index	1	1.09	1.09	1.10	1.09	1.09	1.06	1.00	1.00	0.98	0.97		
Japan Electric Wire and Cable Makers' Association	CO2 emissions	100	92.7	87.3	87.7	91.9	85.5	84.9	88.8	82.7	83.8	81.8	-17.8%	-2.4%
	CO2 emissions intensity (copper/aluminum)	1	0.97	1.04	1.11	1.07	1.11	1.10	1.17	1.10	1.07	1.01		
	(optical fiber)	1	0.77	0.72	0.58	0.45	0.40	0.44	0.49	0.42	0.27	0.26		
	Energy consumption ☆	58.8	61.0	58.4	56.9	57.1	53.2	50.1	49.5	47.3	46.8	47.3	-19.5%	+1.1%
	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		
	(optical fiber) ☆	1	0.85	0.81	0.63	0.46	0.40	0.42	0.43	0.39	0.24	0.23		
	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		
(optical fiber)	1	5.38	5.29	8.33	13.82	18.02	13.03	11.75	10.62	14.37	17.98			
Japan Auto-body Industries Association, Inc.	CO2 emissions ☆	91.0	82.6	79.9	82.2	86.8	86.5	89.8	92.8	88.2	99.3	100.8	+10.8%	+1.6%
	CO2 emissions intensity	1	0.94	0.95	0.96	0.92	0.76	0.73	0.73	0.70	0.67	0.62		
	Energy consumption	47.6	46.7	46.1	45.9	47.4	47.1	47.8	48.5	47.9	52.9	54.7	+14.7%	+3.3%
	Energy consumption intensity	1	1.02	1.04	1.03	0.96	0.79	0.75	0.72	0.73	0.68	0.65		
	Production activity index	1	0.96	0.93	0.94	1.04	1.25	1.34	1.40	1.39	1.62	1.77		
Japan Dairy Industry Association	CO2 emissions	84.2	95.1	97.7	102	100	102	93	111	110	110	109	+29.6%	-0.9%
	CO2 emissions intensity	0.91	0.85	0.87	0.89	1	1.03	1.10	1.07	1.05	1.09	1.05		
	Energy consumption	39.7	48.2	50.0	51.1	48.8	50.0	43.9	51.5	51.1	50.6	51.3	+29.1%	+1.4%
	Energy consumption intensity ☆	0.88	0.89	0.91	0.91	1	1.04	1.06	1.01	1.01	1.03	1.01		
	Production activity index	1	1.20	1.21	1.23	1.08	1.06	0.92	1.12	1.12	1.09	1.12		
Japan Brass Makers Association	CO2 emissions	65.5	57.2	50.7	54.1	56.4	47.9	53.6	56.6	56.7	58.3	58.6	-10.5%	+0.6%
	CO2 emissions intensity	1	0.88	0.86	0.93	0.85	0.94	0.89	0.97	0.88	0.91	0.89		
	Energy consumption	37.0	35.4	31.6	32.7	33.3	28.2	30.3	30.7	31.2	31.7	32.5	-12.1%	+2.6%
	Energy consumption intensity ☆	1	0.97	0.95	1.00	0.89	0.98	0.90	0.93	0.86	0.88	0.87		
	Production activity index	1	0.99	0.90	0.89	1.02	0.78	0.92	0.89	0.98	0.98	1.01		
Japan Society of Industrial Machinery Manufact	CO2 emissions ☆	64.7	58.1	53.0	52.0	54.2	52.0	53.9	56.2	55.8	58.9	57.4	-11.3%	-2.6%
	CO2 emissions intensity		1.00	0.99	1.10	1.10	1.16	1.20	1.36	1.28	1.27	1.16		
	Energy consumption	36.6	35.9	33.6	31.5	31.4	29.9	29.8	29.7	30.1	31.3	31.3	-14.4%	+0.2%
	Energy consumption intensity		1.00	1.02	1.08	1.03	1.08	1.07	1.17	1.12	1.10	1.02		
	Production activity index		1.00	0.92	0.81	0.85	0.77	0.78	0.71	0.75	0.77	0.85		
Japan Bearing Industrial Association	CO2 emissions	61.1	58.2	53.7	54.9	59.5	55.2	61.0	66.0	67.3	70.4	68.6	+12.2%	-2.6%
	CO2 emissions intensity ☆		1	0.99	0.98	0.96	1.00	1.03	1.02	0.95	0.95	0.89		
	Energy consumption	35.4	36.4	34.5	34.2	35.5	33.0	35.0	36.1	38.1	38.9	39.1	+10.5%	+0.6%
	Energy consumption intensity		1	1.02	0.97	0.92	0.96	0.94	0.89	0.86	0.84	0.82		
	Production activity index		1	0.93	0.96	1.07	0.95	1.02	1.12	1.21	1.27	1.32		

Industry	(☆ : target defined in terms of this index)	Fiscal	Compared to fiscal 1990(%)	Compared to fiscal 2005(%)										
		1990	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006		
Japan Sugar Refiners' Association	CO2 emissions ☆	58.0	48.8	47.6	47.4	49.1	48.6	45.8	47.8	44.0	43.3	43.1	-25.8%	-0.4%
	CO2 emissions intensity	1	0.94	0.94	0.94	0.95	0.96	0.93	0.95	0.89	0.85	0.90		
	Energy consumption	24.3	22.1	21.6	21.5	22.0	21.8	20.1	20.9	19.6	19.7	20.4	-16.1%	+3.7%
	Energy consumption intensity	1	1.01	1.02	1.02	1.01	1.03	0.97	0.98	0.95	0.96	1.03		
	Production activity index	1	0.90	0.88	0.87	0.90	0.88	0.85	0.87	0.85	0.85	0.82		
Japan Sanitary Equipment Industry Association	CO2 emissions ☆	47.8	41.5	34.8	35.4	36.4	37.2	35.3	36.3	36.2	35.2	33.4	-30.0%	-4.9%
	CO2 emissions intensity	1	0.81	0.82	0.83	0.80	0.83	0.80	0.78	0.73	0.69	0.62		
	Energy consumption	22.4	21.4	18.3	18.4	18.3	18.2	17.0	16.9	16.8	16.7	16.5	-26.4%	-1.2%
	Energy consumption intensity	1	0.89	0.91	0.91	0.86	0.86	0.82	0.77	0.73	0.70	0.65		
	Production activity index	1	1.08	0.89	0.89	0.95	0.94	0.93	0.98	1.03	1.07	1.13		
The Japan Soft Drinks Association	CO2 emissions	45.9	65.9	68.4	74.6	80.7	84.9	88.2	93.0	97.0	100.1	101.6	+121.4%	+1.5%
	CO2 emissions intensity ☆	1	0.98	0.99	1.02	1.07	1.04	1.09	1.10	1.07	1.17	1.13		
	Energy consumption	20.3	30.9	32.9	35.9	38.4	40.8	42.1	43.8	46.0	47.8	50.0	+145.8%	+4.5%
	Energy consumption intensity	1	1.04	1.07	1.10	1.15	1.13	1.18	1.17	1.15	1.26	1.26		
	Production activity index	1	1.47	1.51	1.60	1.64	1.78	1.76	1.85	1.97	1.87	1.96		
Limestone Association of Japan	CO2 emissions	45.3	41.8	39.8	40.4	41.5	41.2	39.0	36.4	35.5	36.2	35.6	-21.5%	-1.8%
	CO2 emissions intensity	1	0.91	0.95	0.98	0.98	1.02	0.95	0.97	0.96	0.95	0.93		
	Energy consumption	22.6	22.0	21.1	20.9	20.9	20.6	19.0	17.2	17.1	17.1	17.1	-24.3%	-0.3%
	Energy consumption intensity ☆	1	0.96	1.01	1.02	0.99	0.99	0.92	0.92	0.93	0.91	0.89		
	Production activity index	1	1.02	0.93	0.91	0.94	0.92	0.91	0.82	0.81	0.84	0.85		
Japan Machine Tool Builders' Association	CO2 emissions	22.9	20.8	22.8	20.0	20.6	19.4	18.4	20.3	22.6	24.9	26.2	+14.2%	+5.3%
	CO2 emissions intensity	1	1.00	1.13	1.02	1.02	1.02	1.27	1.15	1.03	0.89	0.84		
	Energy consumption ☆	14.5	14.5	16.3	13.7	14.1	13.3	11.9	12.5	14.2	15.5	16.6	+14.8%	+7.2%
	Energy consumption intensity ☆	1	1.03	1.12	1.00	0.99	0.99	1.19	1.02	0.93	0.80	0.76		
	Production activity index	1	1.00	1.10	0.85	0.98	0.92	0.69	0.85	1.06	1.33	1.50		
Flour Millers Association	CO2 emissions	16.9	18.6	18.0	18.6	19.1	18.9	20.3	22.5	21.3	21.2	21.1	+24.8%	-0.4%
	CO2 emissions intensity ☆	1	1.00	0.93	0.95	0.97	0.96	1.03	1.12	1.08	1.07	1.08		
	Energy consumption	10.8	12.6	12.9	12.7	12.5	12.4	12.5	13.0	12.7	12.3	12.5	+16.2%	+1.7%
	Energy consumption intensity	1	1.06	1.04	1.02	0.99	0.98	1.00	1.02	1.00	0.98	1.00		
	Production activity index	1	1.10	1.15	1.16	1.17	1.16	1.16	1.19	1.17	1.17	1.16		
The Shipbuilders' Association of Japan(A) The Cooperative Association of Japan Shipbuilders(B)	CO2 emissions	14.9	19.1	17.9	18.6	18.1	18.1	24.1	25.8	26.5	28.6	30.7	+105.6%	+7.4%
	CO2 emissions intensity (A)	1	0.88	0.80	0.77	0.73	0.74	1.02	0.98	0.84	0.85	0.84		
	(B)					1	1.23	1.22	1.29	1.18	1.22	1.12		
	Energy consumption	9.8	14.3	13.9	13.6	12.6	12.5	15.6	15.5	16.5	17.2	19.0	+94.1%	+10.5%
	Energy consumption intensity (A) ☆	1	0.96	0.91	0.81	0.88	0.90	0.95	0.98	0.90	0.92	0.95		
	(B) ☆	1	0.92	0.97	0.88	0.87	0.88	0.87	0.89	0.88	0.91	0.88		
	Production activity index (A)	1	1.45	1.50	1.62	1.42	1.40	1.40	1.55	1.83	1.97	2.16		
(B)					1	0.77	0.85	0.86	1.12	1.09	1.17			
Japan Industry Vehicles Association	CO2 emissions ☆	6.1	6.1	5.7	6.2	6.1	5.4	5.8	6.0	6.1	6.5	6.6	+7.2%	+1.1%
	CO2 emissions intensity	1	1.27	1.53	1.60	1.42	1.39	1.46	1.43	1.25	1.18	1.10		
	Energy consumption	3.2	3.5	3.3	3.4	3.4	3.0	3.1	3.2	3.3	3.4	3.5	+8.9%	+2.7%
	Energy consumption intensity	1	1.38	1.67	1.68	1.49	1.48	1.50	1.43	1.27	1.18	1.12		
	Production activity index	1	0.79	0.61	0.63	0.70	0.63	0.64	0.69	0.79	0.90	0.97		

Industry	(☆ : target defined in terms of this index)	Fiscal	Compared to fiscal 1990(%)	Compared to fiscal 2005(%)										
		1990	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006		
Japan Association of Rolling Stock Industries	CO2 emissions ☆	4.3	3.3	3.2	3.3	3.2	3.2	3.0	3.0	3.1	3.4	3.5	-18.7%	+3.1%
	CO2 emissions intensity	1	0.81	0.77	0.70	0.74	0.77	0.64	0.66	0.46	0.53	0.47		
	Energy consumption	2.4	2.0	2.0	2.0	1.9	1.9	1.7	1.7	1.8	1.9	2.0	-16.6%	+6.6%
	Energy consumption intensity	1	0.89	0.88	0.78	0.79	0.83	0.66	0.66	0.47	0.52	0.48		
	Production activity index	1	0.96	0.96	1.08	1.01	0.95	1.08	1.07	1.59	1.49	1.75		
Japan Petroleum Development Association	CO2 emissions	22.2	27.0	25.4	24.4	29.3	29.1	35.2	38.1	33.7	38.8	44.7	+101.0%	+15.0%
	CO2 emissions intensity ☆	1	0.83	0.79	0.75	0.84	0.86	1.02	1.06	0.74	0.82	0.89		
	Energy consumption	6.0	6.9	7.0	6.4	7.0	6.3	7.1	6.6	7.1	8.4	9.0	+51.2%	+7.0%
	Energy consumption intensity	1	0.91	0.94	0.88	0.89	0.81	0.86	0.74	0.76	0.84	0.86		
	Production activity index	1	1.28	1.25	1.22	1.32	1.31	1.38	1.50	1.56	1.68	1.77		
Emissions from industrial processes	CO2 emissions	6,208	6,067	5,436	5,437	5,489	5,317	5,192	5,033	5,020	5,148	5,215		
Revisions	CO2 emissions	-65	-155	-169	-139	-139	-129	-125	-127	-136	-135	-146		
	Energy consumption	-79	-96	-83	-78	-123	-116	-100	-105	-111	-125	-131		
Total	CO2 emissions	51,203	52,993	50,166	51,247	50,623	49,062	49,976	50,399	50,497	50,567	50,458	-1.5%	-0.2%
	Energy consumption	16,710	17,789	16,989	17,182	16,880	16,298	16,577	16,688	16,827	16,836	16,876	+1.0%	+0.2%

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

* Total CO2 emissions and energy consumption for the 35 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 have the Japan Gas Association, Japan Iron and Steel Federation, 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, Japan Automobile Manufacturers Association, Japan Mining Industry 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.

* 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.

* 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 (The Japan Bearing Industrial Association and Japan Machine Tool Builders' Association use fiscal 1997 as the base year, Japan Dairy Industry Association uses fiscal 2000 as the base year, and Japan Aluminum Association uses fiscal 1995 as the base year for the energy consumption intensity index).

Trends in the Transportation, Offices and Household Sector

Commercial Sector

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

Industries	☆ : target defined in terms of this index	Fiscal 1990	Fiscal 1997	Fiscal 1998	Fiscal 1999	Fiscal 2000	Fiscal 2001	Fiscal 2002	Fiscal 2003	Fiscal 2004	Fiscal 2005	Fiscal 2006	Compared to fiscal 1990(%)	Compared to fiscal 2005(%)
Japan Association of Refrigerated Warehouses	CO ₂ emissions	55.2	57.4	57.6	61.1	60.9	61.9	65.9	69.9	69.8	73.9	71.3	29.1%	-3.5%
	CO ₂ emissions intensity	1	0.82	0.80	0.84	0.83	0.85	0.91	0.96	0.96	1.00	0.97		
	Energy consumption	36.2	43.1	44.6	44.7	42.2	42.9	42.5	42.0	43.3	44.4	44.0	21.6%	-0.7%
	Energy consumption intensity ☆	1	0.94	0.95	0.93	0.88	0.90	0.89	0.88	0.91	0.92	0.91		
	Production activity index	1	1.27	1.30	1.32	1.32	1.32	1.31	1.32	1.31	1.33	1.33		
Japan LP Gas Association	CO ₂ emissions	3.0	2.9	2.8	3.0	2.9	3.0	3.2	3.4	3.3	3.3	3.3	7.3%	-2.7%
	CO ₂ emissions intensity	1	0.83	0.81	0.85	0.85	0.87	0.91	0.98	0.98	1.02	1.01		
	Energy consumption	2.0	2.2	2.2	2.2	2.0	2.0	2.0	2.0	2.1	2.0	2.0	1.1%	0.1%
	Energy consumption intensity ☆	1	0.95	0.96	0.95	0.89	0.91	0.90	0.89	0.93	0.93	0.95		
	Production activity index	1	0.77	0.75	0.77	0.74	0.75	0.76	0.75	0.74	0.72	0.71		
Japanese Bankers Association	CO ₂ emissions					53.3	53.6	55.0	56.9	54.4	53.6	52.3	※ -1.8%	-2.4%
	Energy consumption ☆					36.9	37.1	35.5	34.2	33.8	32.1	32.3	-12.5%	0.4%
The Real Estate Companies Association of Japan	CO ₂ emissions intensity	1	0.86	0.88	0.86	1.01	0.84	0.94	0.97	0.98	1.03	0.93		
	Energy consumption intensity ☆	1	0.97	1.03	0.94	1.07	0.90	0.95	0.94	0.97	1.03	0.95		
The General Insurance Association of Japan	CO ₂ emissions					3.5	4.3	4.1	4.1	3.7	3.7	3.6	※ 1.7%	-3.4%
	Energy consumption					2.4	2.6	2.4	2.3	2.2	2.1	2.1	-13.0%	-0.9%
NTT Group	CO ₂ emissions	128	157	162	180	213.5	230.5	275.2	311.9	310.3	329.9	341.6	167.1%	3.5%
	CO ₂ emissions intensity ☆	1.00	0.81	0.82	0.85	0.91	0.96	1.23	1.37	1.40	1.50	1.55		
	Energy consumption	84	118	126	132	144	155	172	182	188	194	206	146.1%	6.5%
	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		
	Production activity index	1.00	1.51	1.56	1.67	1.83	1.87	1.75	1.77	1.73	1.72	1.72		
KDDI	CO ₂ emissions								61	63	78	96	※ 58.9%	23.2%
	Energy consumption ☆								25	26	32	39	55.6%	23.2%
	Production activity index								1.00	1.09	1.23	1.39		
Japan Foreign Trade Council, Inc.	CO ₂ emissions ☆			5.8	5.9	5.8	5.6	5.8	6.4	5.6	4.6	4.3	※ -25.9%	-6.4%
	Energy consumption			4.4	4.2	3.9	3.8	3.7	3.8	3.4	2.8	2.7	-39.5%	-3.8%

Transportation Sector

Industries	☆ : target defined in terms of this index	Fiscal 1990	Fiscal 1997	Fiscal 1998	Fiscal 1999	Fiscal 2000	Fiscal 2001	Fiscal 2002	Fiscal 2003	Fiscal 2004	Fiscal 2005	Fiscal 2006	Compared to fiscal 1990(%)	Compared to fiscal 2005(%)
The Scheduled Airlines Associations of Japan	CO2 emissions intensity ☆	1	0.91	0.90	0.89	0.90	0.89	0.87	0.89	0.88	0.88	0.88		
The Japanese Shipowners' Association	CO2 emissions	3,862	4,279	4,366	4,505	4,708	4,562	4,583	4,984	5,262	5,585	6,031	56.2%	8.0%
	CO2 emissions intensity ☆	1	0.86	0.90	0.85	0.84	0.85	0.87	0.85	0.88	0.88	0.85		
	Energy consumption intensity	1	0.86	0.90	0.85	0.84	0.85	0.87	0.85	0.88	0.88	0.85		
	Production activity index	1	1.28	1.26	1.37	1.45	1.38	1.36	1.53	1.54	1.65	1.83		
Japan Federation of Coastal Shipping Associations	CO2 emissions	859	904	876	886	919	934	895	854	787	790	794	-7.6%	0.5%
	CO2 emissions intensity	1	1.07	1.09	1.09	1.07	1.08	1.07	1.10	1.01	1.04	1.07		
	Energy consumption	314	330	320	323	335	340	326	311	287	288	289	-7.9%	0.4%
	Energy consumption intensity ☆	1	1.07	1.09	1.08	1.07	1.07	1.06	1.09	1.00	1.04	1.06		
	Production activity index	1	0.98	0.94	0.95	1.00	1.01	0.98	0.91	0.91	0.88	0.87		
Japan Trucking Association	CO2 emissions	*4 4,587	4,628	4,546	4,630	4,772	4,733	4,780	4,719	4,472				
	CO2 emissions intensity ☆	1	0.99	0.98	0.96	0.95	0.93	0.93	0.87	0.81				
	Energy consumption	1,724	1,739	1,708	1,740	1,793	1,778	1,796	1,773	1,680				
	Energy consumption intensity	1	0.99	0.98	0.96	0.95	0.93	0.93	0.87	0.81				
	Production activity index	1	1.01	1.01	1.05	1.10	1.11	1.12	1.18	1.21				
All Japan Freight Forwarders Association	CO2 emissions ☆			15.2			14.6	14.6	14.6	14.5	14.3	13.9	※ -8.8%	-2.7%
	Energy consumption			5.7			5.5	5.5	5.5	5.5	5.4	5.2	-8.8%	-2.7%
Non-governmental Railways Association	CO2 emissions ☆	201	192	188	201	203	203	219	233	227	230	218	8.3%	-5.3%
	CO2 emissions intensity	1	0.85	0.84	0.88	0.87	0.87	0.94	0.99	0.96	0.98	0.92		
	Energy consumption	132	144	146	147	141	141	142	140	141	138	134	2.0%	-2.5%
	Energy consumption intensity	1	0.98	0.99	0.99	0.92	0.92	0.92	0.90	0.91	0.89	0.87		
	Production activity index	1	1.12	1.12	1.13	1.15	1.16	1.16	1.17	1.17	1.17	1.17		

Note 1: The table presents data on CO2 emissions, energy consumption, and CO2 emissions intensity and energy consumption intensity that has been provided to Japan Business Federation by industries in the commercial and transportation sectors.

Note 2: 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.

Note 3: Japanese Bankers Association and the General Insurance Association of Japan use fiscal 2000, Japan Foreign Trade Council and All Japan Freight Forwarders Association use 1998, and KDDI use fiscal 2003 as their base year for calculating change in CO2 emissions and energy consumption.

Note 4: Japan Trucking Association uses fiscal 1996 as their base year, and their figures listed under fiscal 1990 represent actual figures for 1996.

(Attachment 3)

Industries Setting Higher Targets in the Fiscal 2007 Follow-up

1. Industries in the industrial and energy-conversion sectors (35 industries)
 setting higher targets: 17 industries

	Nature of change		Reason for change
	Former target	Revised target	
Petroleum Association of Japan	Reduce refinery energy intensity by 10% in FY 2010 compared to FY 1990	Reduce average refinery energy intensity between FY 2008 and 2012 by 13% compared to FY 1990	Increase of target
The Japan Gas Association	Reduce the CO ₂ emission intensity of the production and supply of city gas from 73 g-CO ₂ /m ³ in FY 1990 to 23 g-CO ₂ /m ³ in FY 2010 (reduction to about one-third) Reduce CO ₂ emissions from 1.16 million t-CO ₂ in FY 1990 to 0.73 million t-CO ₂ in FY 2010	Reduce the CO ₂ emission intensity of the production and supply of city gas from 84 g-CO ₂ /m ³ in FY 1990 to 12 g-CO ₂ /m ³ between FY 2008 and 2012 (average value) Reduce CO ₂ emissions from 1.33 million t-CO ₂ in FY 1990 to 0.54 million t-CO ₂ between FY 2008 and 2012	Increase of targets Change in calculation method
Japan Chemical Industry Association	1. Work to reduce energy intensity to 90% of 1990 by around 2010 2. Work to develop the chemical industry's independent catalyst technology, biotechnology, and environmentally friendly process technology 3. Transfer energy-saving and environmental protection technologies developed domestically to foreign operations and contribute to CO ₂ emission reduction	1. Work to reduce average energy intensity between FY 2008 and 2012 to 80% of 1990 (target may be changed to around 87% should factors worsening energy intensity arise) 2. Establish guidelines for energy-saving activities for operational units, such as the head office and sales offices, and begin such activities 3. Solicit all member companies of the Japan Chemical Industry	Increase of target

	programs in developing nations	Association to join “Household Energy-Saving Activities Promoted by the Chemical Industry,” a program to promote nationwide energy-saving efforts led by the government, and begin such activities 4. Prepare a catalog of the energy and environmental technologies of Japan’s chemical industry and provide it to people needing energy-saving technologies, such as developing nations 5. Continue to develop and promote the spread of new energy-saving materials	
Japan Paper Association	1. Aim to reduce the fossil energy intensity of products by 13% in FY 2010 compared to FY 1990 and aim to reduce CO ₂ emission intensity by 10% compared to FY 1990 2. Work to promote afforestation programs domestically and abroad and aim to increase owned or managed forests to 0.60 million ha by FY 2010	1. Aim to reduce the five-year average of the fossil energy intensity of products between FY 2008 and 2012 by 20% compared to FY 1990 and aim to reduce the CO ₂ emission intensity of fossil energy consumption by 16% compared to FY 1990 2. Work to promote afforestation programs domestically and abroad and aim to increase owned or managed forests to 0.70 million ha by FY 2012	Increase of target Increase of target
Japan Cement Association	Reduce the energy intensity of cement	Reduce the five-year average of the energy	Increase of target

	production by about 3% in FY 2010 compared to FY 1990	intensity of cement production between FY 2008 and 2012 by 3.8% compared to FY 1990	
Four electrical/electronics-related groups	Improve the CO ₂ emission intensity of inflation-adjusted production value by 28% by 2010 compared to FY 1990	Improve the CO ₂ emission intensity of inflation-adjusted production value by 35% by 2010 compared to FY 1990	Increase of target
Japan Automobile Manufacturers Association	Reduce total CO ₂ emissions between FY 2008 and 2012 of the production plants of the 14 member companies of the Japan Automobile Manufacturers Association by 10% (average value) compared to FY 1990	Reduce total CO ₂ emissions between FY 2008 and 2012 of the production plants of the 14 member companies of the Japan Automobile Manufacturers Association by 12.5% (average value) compared to FY 1990	Increase of target
Japan Federation of Housing Organizations	A reduction target of 7% compared to FY 1990 for the construction stage Reductions made in each stage of the housing life cycle, with aggregate CO ₂ emissions stabilized at the FY 1990 level in FY 2010 and subsequent years	Reduce CO ₂ emissions by 20% in FY 2010 compared to FY 1990 for the construction stage Promote efforts to stabilize CO ₂ emissions of the total housing life cycle at the FY 1990 level in FY 2010 and subsequent years	Increase of target
Japan Mining Industry Association	Reduce energy intensity by 10% in FY 2010 compared to FY 1990	Reduce energy intensity by 12% in FY 2010 compared to FY 1990; target to be achieved as an average for FY 2008 to 2012	Increase of target
Lime Manufacture Association	Reduce the energy consumption of lime production by 6% in FY 2010 compared to FY 1990	1. Reduce the five-year average of the energy consumption of lime production between FY 2008 and 2012 by 8% compared to FY 1990 2. Reduce the five-year	Increase of target New target

		average of CO ₂ emissions related to the energy consumption of lime production between FY 2008 and 2012 by 8% compared to FY 1990	
The Japan Rubber Manufacturers Association	As a measure to address climate change, establish the following target as the Japan Rubber Manufacturers Association for the reduction of CO ₂ emissions related to fuel and electricity consumption in production activities and work to achieve the target; also, endeavor to reduce CO ₂ emissions from the life-cycle assessment perspective in the future Maintain FY 1990 levels of CO ₂ emissions and energy intensity in FY 2010	As a measure to address climate change, establish the following targets for the reduction of CO ₂ emissions related to fuel and electricity consumption in production activities, after adopting a calculation method that uses thermal energy intensity, which appropriately reflects the effect of cogeneration systems in reducing CO ₂ emissions, and work to achieve the target; also, endeavor to reduce CO ₂ emissions from the life-cycle assessment perspective in the future <ul style="list-style-type: none"> • Reduce energy intensity by 8% in FY 2010 compared to FY 1990 • Reduce CO₂ emissions by 6% in FY 2010 compared to FY 1990 	Change to a method where, regarding the effect of cogeneration systems in reducing CO ₂ emissions, the amount of CO ₂ emissions calculated by a thermal power generation average formula is deducted from total purchased electricity (all electricity sources average formula) Increase of target for energy intensity
Flat Glass Manufacturers Association of Japan	Reduce total energy consumption related to production by 14% in FY 2005 compared to FY 1990 and by 15% in FY 2010	Reduce total energy consumption related to production by 21% in FY 2010 compared to FY 1990 Reduce CO ₂ emissions related to fuel	Increase of target New target

		consumption by 22% in FY 2010 compared to FY 1990	
Japan Aluminium Association	Improve energy intensity by 10% in FY 2010 compared to FY 1995	Improve energy intensity by 11% in FY 2010 compared to FY 1995	Increase of target
The Japanese Electric Wire & Cable Makers' Association	1. Reduce the energy consumption of copper and aluminum wire production at production plants in FY 2010 by 20% compared to FY 1990 2. Reduce the energy intensity of the per unit length of fiber-optic cable produced at manufacturing plants in FY 2010 by 75% compared to FY 1990	1. Aim to reduce the energy consumption of copper and aluminum wire production at production plants by 27% by FY 2010 as a five-year average for 2008 to 2012 compared to FY 1990 2. Reduce the energy consumption per unit length of fiber-optic cable produced at manufacturing plants by 77% by FY 2010 as a five-year average for 2008 to 2012 compared to FY 1990	Increase of target
Japan Copper and Brass Association	Reduce the energy intensity of production by 8.6% in 2010 compared to FY 1995 (reduction of 13.1% compared to FY 1990)	Aim to reduce the energy intensity of production by 9.05% in FY 2010 compared to FY 1995 (reduction of 13.55% compared to FY 1990) The above target will be achieved as a five-year average for FY 2008 to 2012	Increase of target
Japan Sugar Refiners' Association	Reduce CO ₂ emissions by 20% in FY 2010 compared to FY 1990	Improve CO ₂ emissions between FY 2008 and 2012 (average value) by 22% compared to FY 1990	Increase of target
Japan Sanitary Equipment Industry Association	Reduce the CO ₂ emissions of production plants in FY 2010 by 20% or more compared to FY 1990	Reduce the five-year average of the CO ₂ emissions of production plants between FY 2008 and 2012 by 25%	Increase of target

		or more compared to FY 1990	
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2. Industries in the commercial sector (13 industries and companies) setting higher targets: 2 industries

	Nature of change		Reason for change
	Former target	Revised target	
Japan Foreign Trade Council, Inc.	Work to reduce the level of CO ₂ emissions in FY 2010 to 37,000 tons	Work to reduce the level of CO ₂ emissions in FY 2010 to 35,000 tons	Increase of target
Japan Department Stores Association	Reduce the energy intensity of stores by 3% in the target year (between 2008 and 2010) compared to 1990	Reduce the energy intensity of stores by 6% in the target year (between 2008 and 2010) compared to 1990	Increase of target

Reference: Industries in the commercial sector (13 industries and companies) adding new targets: 2 industries

	Nature of change		Reason for change
	Former target	Revised target	
The General Insurance Association of Japan	<ul style="list-style-type: none"> Promote company efforts to further reduce the use of paper resources, and work as an industry to hold the level of paper usage below current levels Work to reduce the consumption of electricity, gas, and other energy resources in offices 	<ul style="list-style-type: none"> Promote company efforts to further reduce the use of paper resources, and work as an industry to hold the level of paper usage below current levels Work to reduce the consumption of electricity, gas, and other energy resources in offices Numerical target: Reduce electricity consumption at head offices by 18% in FY 2010 compared to FY 2000 Non-numerical target: Promote the introduction of low emission vehicles as company-owned	Addition of a numerical target

		vehicles for insurance companies	
The Life Insurance Association of Japan	No numerical target	Aim to reduce average electricity consumption at head-office buildings between FY 2008 and 2012 by 2% compared to FY 2006 (estimated reduction of about 17% compared to FY 2000) Aim to hold electricity consumption per unit of floor space below the level of FY 2006	Addition of numerical targets

3. Industries in the transportation sector (13 industries and companies)
setting higher targets: 4 industries

	Nature of change		Reason for change
	Former target	Revised target	
The Scheduled Airlines Association of Japan	Reduce CO ₂ emissions from the use of aviation fuel by 10% per unit of production (available seat kilometers) by FY 2010 compared to FY 1990	Reduce CO ₂ emissions from the use of aviation fuel by 12% per unit of production (available seat kilometers) by FY 2010 compared to FY 1990	Increase of target
The Japanese Shipowners' Association	Reduce CO ₂ emissions per unit of shipment by about 10% in 2010 compared to 1990	Reduce CO ₂ emissions per unit of shipment by 15% between FY 2008 and 2012 (average value) compared to FY 1990	Increase of target
Japan Trucking Association	Aim to reduce the CO ₂ emission intensity of commercial trucks by 4% in FY 2010 compared to the forecast for FY 1996 to FY 2010	Aim to reduce the CO ₂ emission intensity of commercial trucks between FY 2008 and 2012 (average value) by 30% compared to FY 1996	Increase of target
All Japan Freight Forwarders Association	Going forward to 2010, reduce CO ₂ emissions by 6% compared to FY 1998 for the same freight volume in FY 1998 through such	Reduce CO ₂ emissions by 11% in FY 2010 compared to FY 1998 for the same freight volume in FY 1998 through such measures	Increase of target

	measures as the introduction of larger and low-emission delivery vehicles	as the introduction of larger and low-emission delivery vehicles	
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Reference: Industries in the transportation sector (13 industries and companies) adding new targets: 1 industry

	Nature of change		Reason for change
	Former target	Revised target	
The Association of Japanese Private Railways	Energy-saving rolling stock as a proportion of total rolling stock was 45% in FY 1990, a figure expected to rise to 76% in FY 2010; this change will reduce the CO ₂ emissions of private railways by 9%	Improve energy intensity between FY 2008 and 2012 (average value) by 15% compared to FY 1990	Addition of numerical target

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)

Japan	U.K.	Nordic countries	U.S.A.	Germany	France	China	India
100	99	104	114	111	103	145	137

Source : Data for foreign countries from ECOFYS, *UPDATED COMPARISON OF POWER EFFICIENCY ON GRID LEVEL*, March 2007.

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")

Japan	France	Canada	Italy	Germany	U.K.	U.S.A.
100	16	50	116	126	118	150

Source: Energy Balances of OECD Countries 2004-2005; The figure for Japan is based on a survey by the Federation of Electric Power Companies of Japan

CO₂ emissions intensity is low for France because 80 percent of its electric power is produced through nuclear power generation, and for Canada because 60 percent of its electric power comes from hydroelectric power generation.

○ Oil (Petroleum Association of Japan)

Energy consumption index of refineries (2002)

Japan	Advanced Asian countries (excluding China)	Western Europe	U.S.A. and Canada
100	101	102	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)

Integrated steelworks energy consumption intensity

Japan	South Korea	EU	China (large scale)	China (whole country)	U.S.A.	Russia
100	105	110	110	120	120	125

Source : Data from Korea Iron & Steel Association, China Iron and Steel Industries Association, and individual interviews

○ Chemicals (Japan Chemical Industry Association)

Electric power consumed in relation to production of electrolytic caustic soda

Japan	Taiwan	South Korea	China	U.S.A.	Western Europe	Eastern Europe
100	100	100	104	110	119	115

Source : SRI Chemical Economic Handbook; Japan Soda Industry Association, *Soda Handobukku* (Soda Handbook)

○ Paper (Japan Paper Association)

Total energy consumption for paper and paperboard produced (before adjustments for imported and exported pulp)

Japan	U.S.A.	Canada	Sweden	Germany
100	144	134	123	52

Source: Data for Japan from Japan Paper Association follow-up report for 2003, "Sekiyuto shouhi dotai tokei"; for U.S.A. from the American Forest & Paper Association's annual statistics for 2002; for Canada from Forest Product Association of Canada, *Environmental Report 2000-2001*; for Sweden and Germany from Confederation of European Paper Industries, *Energy Profile 2001*.

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 (for 2000)

Japan	Western Europe	South Korea	Central and South	China	U.S.A.	Russia
100	130	131	145	152	177	178

Source: Battelle, *Toward a Sustainable Cement Industry*
Substudy 8: CLIMATE CHANGE, 2002.

○ Mining (Japan Mining Industry Association)

Energy consumption intensity of copper refineries

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

Source: Sample data collected through interviews. Comparison is of energy consumption intensity (MJ/ton) of copper refineries

○ Aluminum (Japan Aluminum Association)

Energy consumption in the plate rolling process

Japan	Global
100	127

Source: International Aluminium Institute, *LCI Report*; Japan Aluminium Association, *LCI Report*

(Attachment 5)

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 five follow-up surveys (fiscal 2002-2006) 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 make recommendations concerning 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 five times.

4. Members of the Evaluation Committee (as of November 12, 2007)

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 Inc. and Affiliate Professor, Nagoya University)
Kiyoe Asada (President, Women's Energy Network)
Hiroyuki Sato (Secretary-General, Green Purchasing Network)
Masaki Mashita (Advisor, Forest Management Association of Japan)
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, Nippon Keidanren (then known as 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, Nippon 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, 57 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 2008-2012 to below the levels of fiscal 1990.”

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. In addition, Nippon 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 positioned the Keidanren Voluntary Action Plan on the Environment as the plan that will play a central role in the industrial and energy-converting sectors' 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

Nippon 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 on Waste]

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 measures undertaken on a voluntary basis were promoted. In 1999, Keidanren laid down a uniform target for the entire industrial sector of 15 million tons (25% of the amount in fiscal 1990) as the quantity of final disposal of industrial waste in fiscal 2010. Follow-up surveys of the state of progress towards achieving that target are conducted annually.