

The Commitment to a Low Carbon  
Society  
Fiscal 2014 Follow-up Results  
(Summary)

<Performance in 2013>

(preliminary figures)

December 16, 2014  
KEIDANREN



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## Introduction: The Purpose and Policy of the Keidanren Commitment to a Low Carbon Society

Keidanren formulated the “Voluntary Action Plan on the Environment (Section on Global Warming Measures)” in 1997 with the purpose of promoting voluntary and proactive efforts to prevent global warming and took measures to achieve its goals to “endeavor to reduce average CO<sub>2</sub> emissions from the industrial and energy-conversion sectors between fiscal 2008 and 2012 to below the level of fiscal 1990.”

Keidanren repeated the PDCA cycle which consisted of four steps: (1) setting up targets (Plan); (2) implementing efforts to achieve the targets (Do); (3) conducting regular follow-ups on the progress made in these efforts (Check); and (4) public disclosure of the follow-up results via the Internet and other means. This process enabled continuous improvements. Furthermore, Keidanren established the Evaluation Committee for the Voluntary Action Plan on the Environment comprising third-party experts which has received high appraisal for ensuring that the data reported by participating industries was properly aggregated and for contributing to the improvements made in the transparency and credibility of the system as a whole.

As a result of continued efforts under the “Voluntary Action Plan on the Environment (Section on Global Warming Measures)” the average CO<sub>2</sub> emissions from the industrial and energy-conversion sectors between fiscal 2008 and 2012 were successfully reduced by 12.1% compared to fiscal 1990 levels. The Voluntary Action Plan has been highly evaluated both domestically and overseas for its success. The Inter-governmental Panel on Climate Change (IPCC)’s Fifth Assessment Report<sup>1</sup> refers to it as a major measure that can be used to promote energy efficiency improvements and the Japanese government has also pointed out that it has “produced results.”<sup>2</sup>

The Japanese business community must incessantly continue its efforts to reduce CO<sub>2</sub> emissions beyond 2013 and contribute to reducing global CO<sub>2</sub> emissions from a long-term perspective. Hence, Keidanren has formulated the Commitment to a Low Carbon Society under which, “as a shared vision, the Japanese business community harnesses its technological prowess and assumes an instrumental role in the drive to halve global greenhouse gas emissions by the year 2050.” At present, 55 industries have formulated action plans based on the following four pillars: (a) the establishment of CO<sub>2</sub> reduction targets for domestic business operations for the year 2020; (b) strengthened co-operation with consumers, customers, and other interested

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<sup>1</sup> Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

<sup>2</sup> METI *Report of the Committee for the Comprehensive Review of the Voluntary Action Plan on the Environment* (April 25, 2014)

groups; (c) contributions on the international level, including the promotion of technology transfers to developing countries; and (d) the development of innovative technologies. These industries are performing the PDCA cycle to soundly promote the Commitment to a Low Carbon Society (see Annex for details of the Commitment to a Low Carbon Society).

Under the Commitment to a Low Carbon Society, participating industries establish CO<sub>2</sub> reduction targets for domestic business operations for the year 2020 that assume that the best available technologies (BATs) are fully harnessed, and as a commitment to society, make maximum efforts to ensure the achievement of their respective targets. Furthermore, they will quantify, wherever possible, the reduction potential of efforts including strengthened co-operation with other interested groups, contributions at the international level, and the development of innovative technologies, and be committed to gaining maximum acceptance from consumers and customers in Japan and abroad for their products, services, and technologies, thus contributing to the reduction of greenhouse gas emissions on a global scale through their business operations.

In the interest of improving transparency and credibility, the Commitment to a Low Carbon Society has an enhanced information disclosure scheme, an increased number of committee members on the Evaluation Committee (a list of members are available in Attachment 9), and a reinforced PDCA cycle, compared to the Voluntary Action Plan on the Environment.

Keidanren has compiled a summary of the results of the Fiscal 2014 Follow-up (performance in fiscal 2013) conducted by participating industries<sup>3</sup>. This is the first follow-up conducted under Keidanren's Commitment to a Low Carbon Society. The detailed efforts taken

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<sup>3</sup> Thirty-one industry organizations participated from the industrial sector: The Japan Iron and Steel Federation; Japan Chemical Industry Association; Japan Paper Association; Liaison Group of Japanese Electrical and Electronics Industries for Global Warming Prevention; Japan Cement Association; Japan Automobile Manufacturers' Association / Japan Auto-Body Industries Association; Japan Auto Parts Industries Association; Japan Mining Industry Association; Japan Federation of Construction Contractors; Japan Federation of Housing Organizations; Lime Manufacture Association; The Japan Rubber Manufacturers Association; The Federation of Pharmaceutical Manufacturers' Associations of Japan; Japan Aluminium Association; Japan Federation of Printing Industries; Flat Glass Manufacturers Association of Japan; Japan Soft Drink Association; Japan Dairy Industry Association; The Japanese Electric Wire & Cable Makers' Association; The Japan Bearing Industrial Association; The Japan Society of Industrial Machinery Manufacturers; Japan Petroleum Development Association; Japan Copper and Brass Association; Brewers Association of Japan; The Shipbuilders' Association of Japan and the Cooperative Association of Japan Shipbuilders; Limestone Association of Japan; Japan Machine Tool Builders' Association; Japan Sanitary Equipment Industry Association; Flour Millers Association, Japan Industrial Vehicles Association; and Japan Association of Rolling Stock Industries.

Three industry organizations participated from the energy-conversion sector: The Federation of Electric Power Companies of Japan; Petroleum Association of Japan; and The Japan Gas Association.

Twelve industry organizations participated from the commercial sector (nine industrial organizations calculated their CO<sub>2</sub> emissions): Japan Chain Stores Association; Telecommunications Carriers Association; Japan Franchise Association; Japan Department Stores Association; Japan Association of Refrigerated Warehouses; Japanese Bankers Association; The Life Insurance Association of Japan; Japan Foreign Trade Council, Inc.; The General Insurance Association of Japan; Japan LP Gas Association; The Real Estate Companies Association of Japan; and Japan Building Owners and Managers Association.

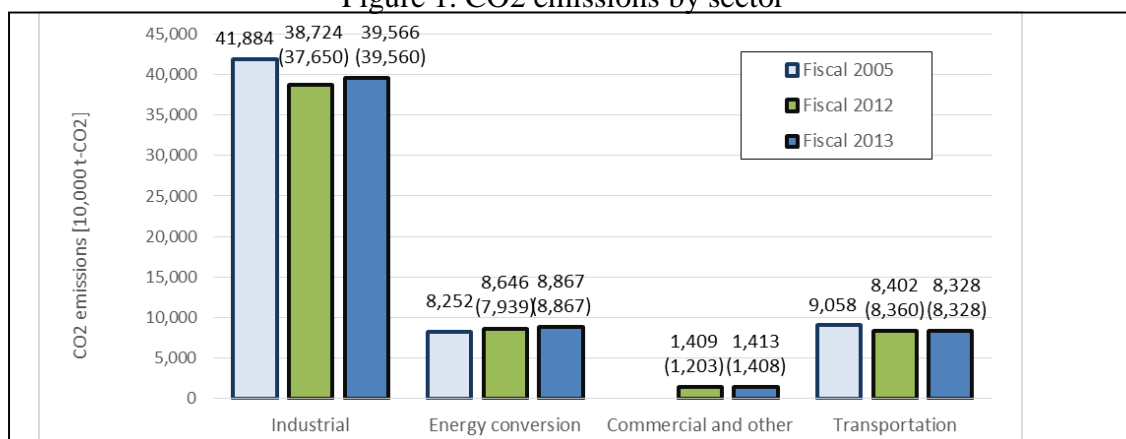
Nine industrial organizations participated from the transportation sector (five industrial organizations calculated their CO<sub>2</sub> emissions): The Japanese Shipowners' Association; Japan Trucking Association; The Scheduled Airlines Association of Japan; Japan Federation of Coastal Shipping Associations; The Association of Japanese Private Railways; JR East; JR West; JR Central; and All Japan Freight Forwarders Association

by each industry can be found in the “Industry-specific Report” (to be published in spring 2015).

## 1. Emission reductions from domestic business operations

The Fiscal 2014 Follow-up revealed that CO2 emissions in fiscal 2013 had amounted to 395.66 million t-CO2 from the industrial sector (31 industries), 88.67 million t-CO2 from the energy conversion sector (3 industries), 14.13 million t-CO2 from the commercial sector (9 industries), and 83.28 million t-CO2 from the transportation sector (5 industries) (see Figures 1, 2, and 3).

Figure 1. CO2 emissions by sector



- (Note) • Data for fiscal 2005 and fiscal 2012 have been collected based on the calculation method used under the Commitment to a Low Carbon Society for comparison purposes.
- Emissions from the commercial sector in fiscal 2005 are not provided due to unsatisfactory data collection status.
  - Emissions from the transportation sector in fiscal 2005 are the aggregate of emissions from four industries.
  - CO2 emissions after consideration of emission abatement based on the depreciation of credits are provided in brackets. Due to delays in UN verification of credits, the abatements based on the depreciation of credits are yet to be considered for emissions in fiscal 2013.

Figure 2. Factors of emission increase/decrease by sector (compared with fiscal 2012)

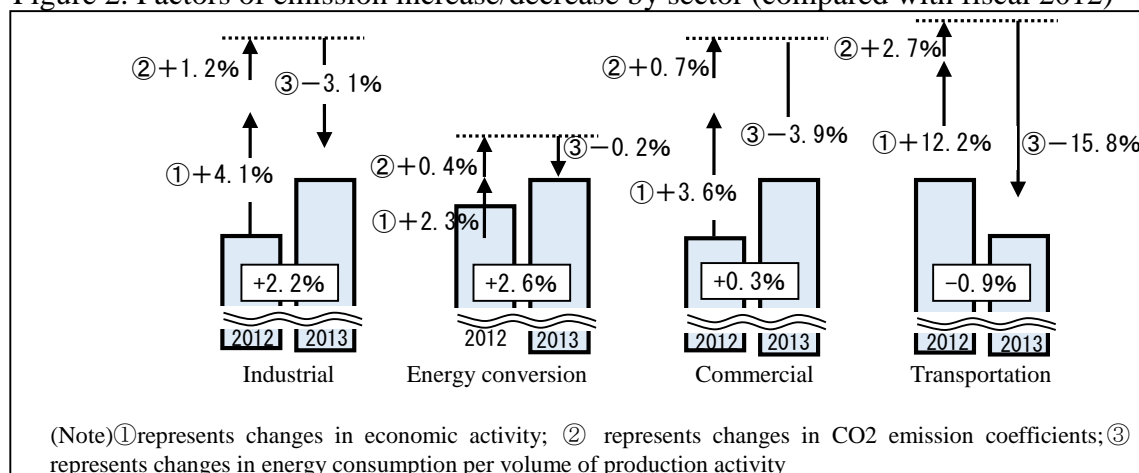
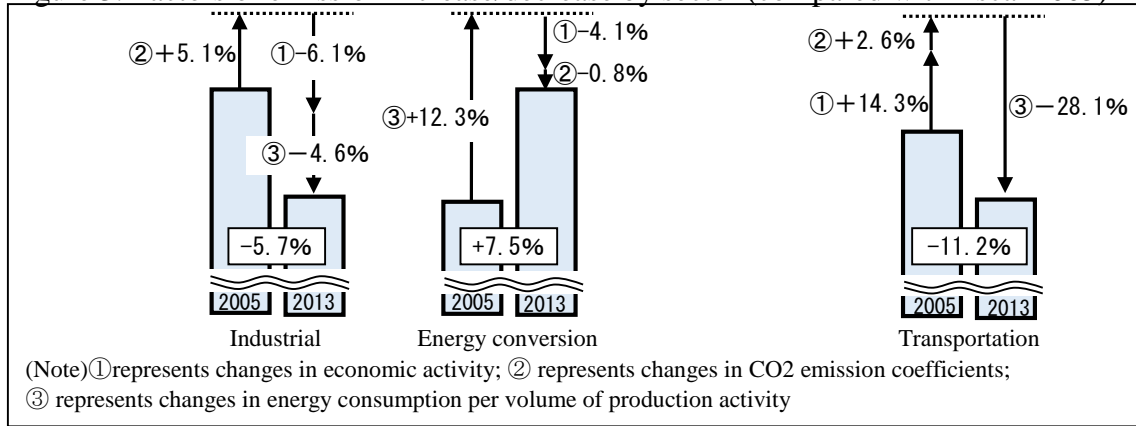




Figure 3. Factors of emission increase/decrease by sector (compared with fiscal 2005)



### (1) Industrial sector

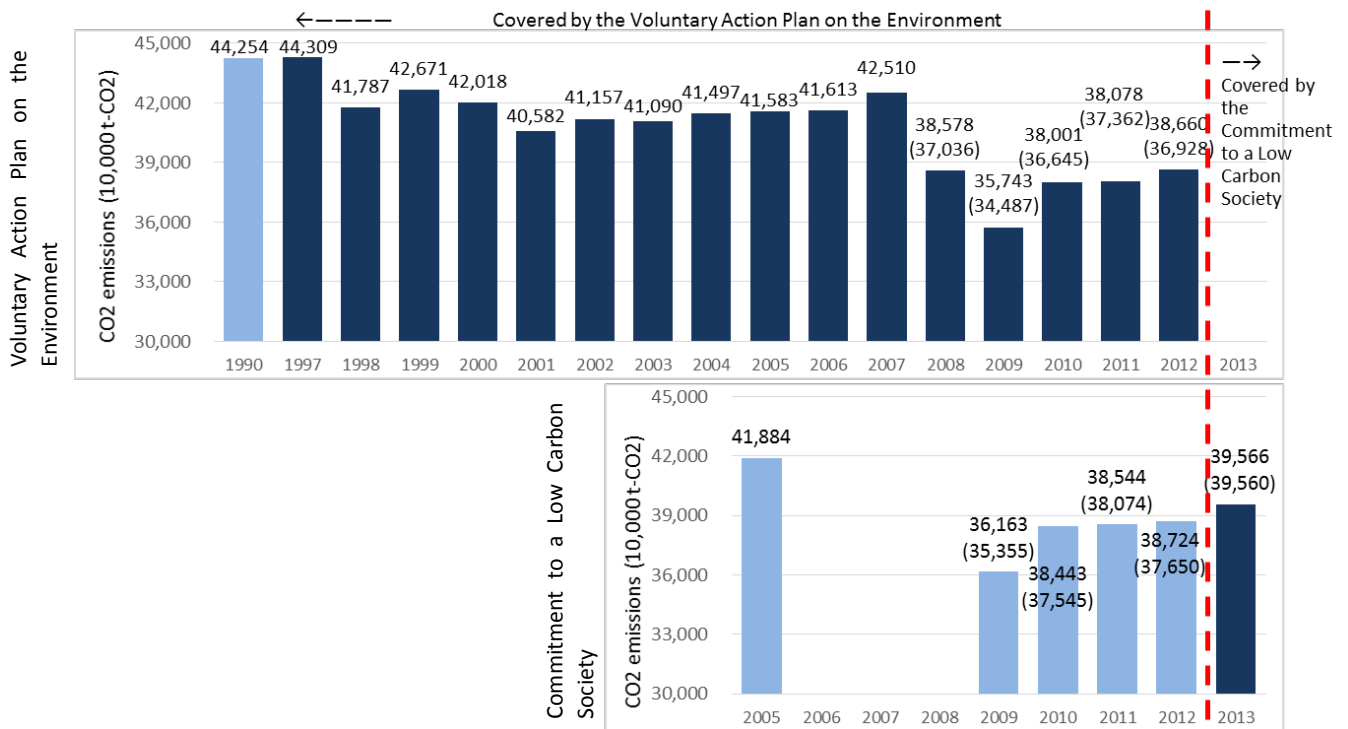
#### A. Performance

The Fiscal 2014 Follow-up revealed that the industrial sector (31 industries) emitted 395.66 million t-CO<sub>2</sub> in fiscal 2013, representing an increase of 2.2% (8.42 million t-CO<sub>2</sub>) compared to fiscal 2012 levels. In comparison with emissions in fiscal 2005, when the Voluntary Action Plan on the Environment (Section on Global Warming Measures) had been implemented, emissions from the sector have decreased by 5.6% (23.18 million t-CO<sub>2</sub>) (see Figure 4.).

The industrial sector (31 industries) emitted 387.24 million t-CO<sub>2</sub> in fiscal 2012, accounting for 84.4% of total emissions from Japan's industrial sector as a whole (469.00 million t-CO<sub>2</sub> in fiscal 2012).

Industries reported that in their efforts to reduce CO<sub>2</sub> emissions in fiscal 2013, they introduced high-efficiency energy-saving facilities, recovered waste energy, converted to more efficient fuels and improved operational methods (see Attachment 2 for details).

Figure 4. CO2 emissions from the industrial sector



- (Note) • The Voluntary Action Plan on the Environment was implemented through fiscal 2012 and succeeded by the Commitment to a Low Carbon Society from fiscal 2013. The figures for fiscal 2005-2012 under the Commitment to a Low Carbon Society have been provided as reference.
- Calculation methods have been renewed with the implementation of the Commitment to a Low Carbon Society. Changes include calculating emissions from power generation using a power demand-end coefficient instead of a generation-end coefficient and setting revised industrial boundaries in calculating emissions from some industries.
  - The CO2 emission figures for the electrical and electronics industry in fiscal 2011 and the years preceding used for emission calculations under the Commitment to a Low Carbon Society are equivalent to those used in the Voluntary Action Plan on the Environment (as the industry used power-receiving end coefficients in prior calculations, which did however apply different industrial boundaries). Emissions from the Shipbuilders' Association of Japan are not included in the figures representing fiscal years prior to 2012.
  - The Japan Federation of Printing Industries was categorized under the commercial sector under the Voluntary Action Plan on the Environment but has been shifted to the industrial sector under the Commitment to a Low Carbon Society.
  - CO2 emissions after consideration of emission abatement based on the depreciation of credits are provided in brackets. Due to delays in UN verification of credits, the abatements based on the deprecation of credits are yet to be considered for emissions in fiscal 2013.

Table 1. Examples of efforts made in fiscal 2013

<p><u>(1) Introduction of high-efficiency energy-saving facilities</u></p> <ul style="list-style-type: none"> <li>• Improved efficiency of motors, transformers, compressors, pumps, sterilizers and fans (replacement with high-efficiency equipment, etc.)</li> <li>• Improved efficiency of power generating facilities and boilers</li> <li>• Installation of inverters in equipment</li> <li>• Application of thermal insulating coating to equipment and piping</li> <li>• Switching to LED lighting</li> <li>• Upgrading to high-efficiency air conditioning facilities</li> </ul>	<p><u>(3) Fuel conversion</u></p> <ul style="list-style-type: none"> <li>• Utilization of biomass fuels, solar power and wind power</li> </ul>
<p><u>(2) Recovery of waste energy</u></p> <ul style="list-style-type: none"> <li>• Utilization and recovery of hot and cold waste heat</li> <li>• Utilization of waste gas</li> <li>• Storage of heat and electric power</li> </ul>	<p><u>(4) Improvement of operational methods</u></p> <ul style="list-style-type: none"> <li>• Optimization of operational conditions including pressure and temperature</li> <li>• Consolidation and rationalization of production lines</li> <li>• Long-term continuous operation and intermittent operation of equipment, reduction of standby operation</li> <li>• Reduction of time required for cleaning</li> <li>• Introduction of energy monitoring facilities</li> <li>• Optimization of air conditioning temperatures</li> </ul>
	<p><u>(5) Others</u></p> <ul style="list-style-type: none"> <li>• Application of solar control window films in factories; upgrading to double-glazed windows</li> <li>• Greening of factory roofs and walls</li> </ul>

## B. Factor analysis

A factor analysis was conducted to uncover the causes that led to a 2.2% increase in CO<sub>2</sub> emissions from the industrial sector (31 industries) in fiscal 2013 relative to fiscal 2012 (see Table 2). From fiscal 2012 to fiscal 2013, increased economic activity and a larger CO<sub>2</sub> emission factor respectively contributed to increased CO<sub>2</sub> emissions by 4.1% and 1.2%, while reduced energy consumption per unit of economic activity contributed to reducing CO<sub>2</sub> emissions by 3.1%.

Table 2. Analysis of contributing factors to increases and decreases in CO<sub>2</sub> emissions from the industrial sector in fiscal 2013<sup>\*1</sup>

	Relative to fiscal 2012	Relative to fiscal 2005
Change in economic activity <sup>*2</sup>	+4.1% (+4.1%)* <sup>4</sup>	-6.1% (-6.1%)
Change in CO <sub>2</sub> emission factor <sup>*3</sup>	+1.2% (+3.9%)	+5.1% (+5.1%)
Change in energy consumed per unit of economic activity	-3.1% <sup>*5</sup> (-3.1%)	-4.6% (-4.6%)
Total	+2.2% (+5.1%)	-5.7% <sup>*6</sup> (-5.7%)

- \*1 Due to the rounding of values to two decimal places, totals may differ from the sum of individual items.
- \*2 The indices with the closest relation to energy consumption were selected to represent the industry's economic activity in each industry.
- \*3 CO2 emissions per unit of heat output have been used for fuel, and CO2 emissions per unit of power output for electricity.
- \*4 CO2 emissions after consideration of emission abatement based on the depreciation of credits are provided in brackets.
- \*5 The figure for fiscal 2012 has improved by 0.8% compared to fiscal 2011 levels, and further improvement has been recorded in fiscal 2013.
- \*6 Data for the Shipbuilders' Association of Japan are not included in the figure provided relative to fiscal 2005.

## (2) Energy conversion sector

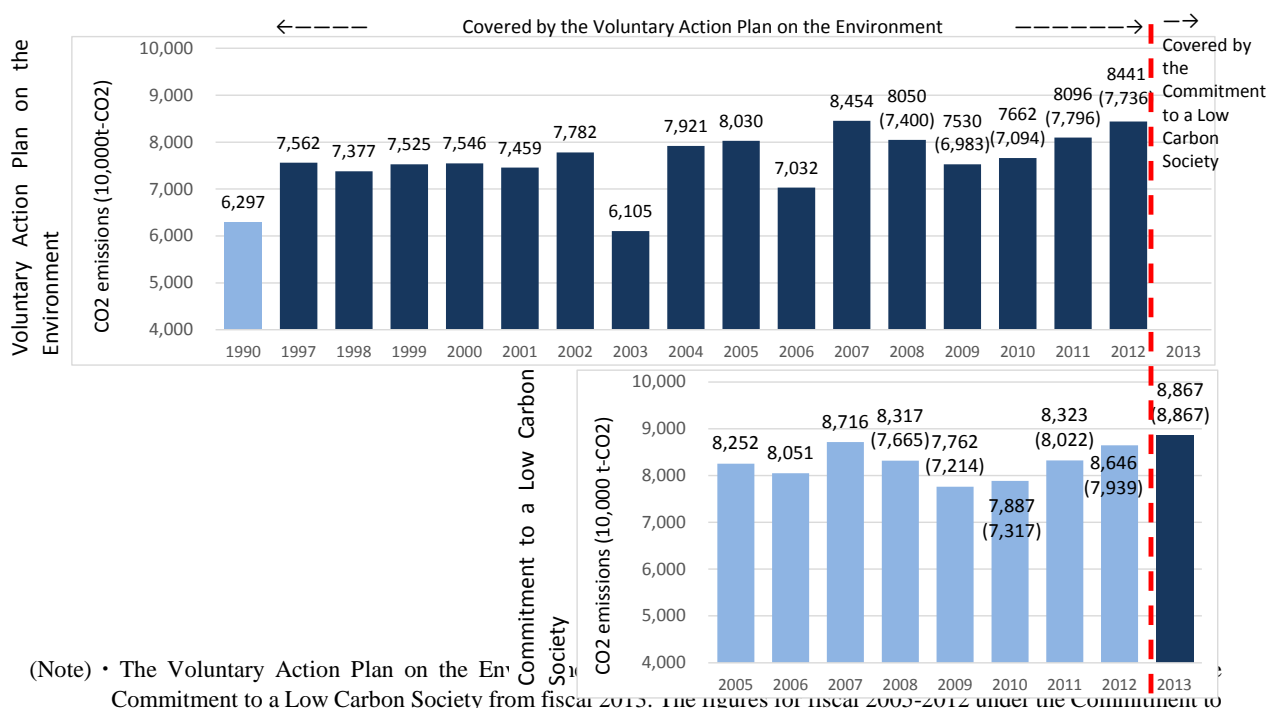
### A. Performance

The Fiscal 2014 Follow-up revealed that the energy conversion sector (3 industries) emitted 88.67 million t-CO2 in fiscal 2013, representing an increase of 2.6% (2.21 million t-CO2) compared to fiscal 2012 levels. In comparison with emissions in fiscal 2005, when the Voluntary Action Plan on the Environment (Section on Global Warming Measures) had been implemented, emissions from the sector have increased by 7.5% (6.15 million t-CO2) (see Figure 5.).

The energy conversion sector (3 industries) emitted 86.46 million t-CO2 in fiscal 2012, accounting for 98.3% of total emissions from Japan's energy conversion sector as a whole (88.00 million t-CO2 in fiscal 2012).

Examples of efforts taken by each industry are provided in Attachment 2.

Figure 5. CO2 emissions from the energy conversion sector



- a Low Carbon Society have been provided as reference.
- Calculation methods have been renewed with the implementation of the Commitment to a Low Carbon Society. Changes include calculating emissions from power generation using a power demand-end coefficient instead of a generation-end coefficient and setting revised industrial boundaries in calculating emissions from some industries.
- The CO2 emission figures for the Federation of Electric Power Companies include emissions from power used in power generation plants and transmission and distribution loss. It should be noted that these emissions are also counted in the emissions from the industrial sector.
- CO2 emission figures from the Voluntary Action Plan on the Environment (note: industrial boundaries have been revised) have been used to represent the Japan Gas Association for emission calculations under the Commitment to a Low Carbon Society in fiscal 2012 and the years preceding.
- CO2 emissions after consideration of emission abatement based on the depreciation of credits are provided in brackets. Due to delays in UN verification of credits, the abatements based on the depreciation of credits are yet to be considered for emissions in fiscal 2013.

## B. Factor analysis

A factor analysis was conducted to uncover the causes that led to a 2.6% increase in CO2 emissions in the energy conversion sector (3 industries) in fiscal 2013 relative to fiscal 2012 (see Table 3). From fiscal 2012 to fiscal 2013, increased economic activity and a larger CO2 emission factor respectively contributed to increased CO2 emissions by 2.3% and 0.4%, while reduced energy consumption per unit of production activity contributed to reducing CO2 emissions by 0.2%.

Table 3. Analysis of contributing factors to increases and decreases in CO2 emissions from the energy conversion sector in fiscal 2013<sup>\*1</sup>

	Relative to fiscal 2012	Relative to fiscal 2005
Change in economic activity <sup>*2</sup>	+2.3% (+2.3%)*4	-4.1% (-4.1%)
Change in CO2 emission factor <sup>*3</sup>	+0.4% (+8.9%)	-0.8% (-0.8%)
Change in energy consumed per unit of economic activity	-0.2% (-0.3%)	+12.3% (+12.3%)
<b>Total</b>	<b>+2.6%</b> (+11.7%)	<b>+7.5%</b> (+7.4%)

\*1 Due to the rounding of values to two decimal places, totals may differ from the sum of individual items.

\*2 The indices with the closest relation to energy consumption were selected to represent the industry's economic activity in each industry.

\*3 Represented by CO2 emissions per unit of heat output have been used for fuel, and CO2 emissions per unit of power output for electricity.

\*4 CO2 emissions after consideration of emission abatement based on the depreciation of credits are provided in brackets.

## (3) Commercial sector

### A. Performance

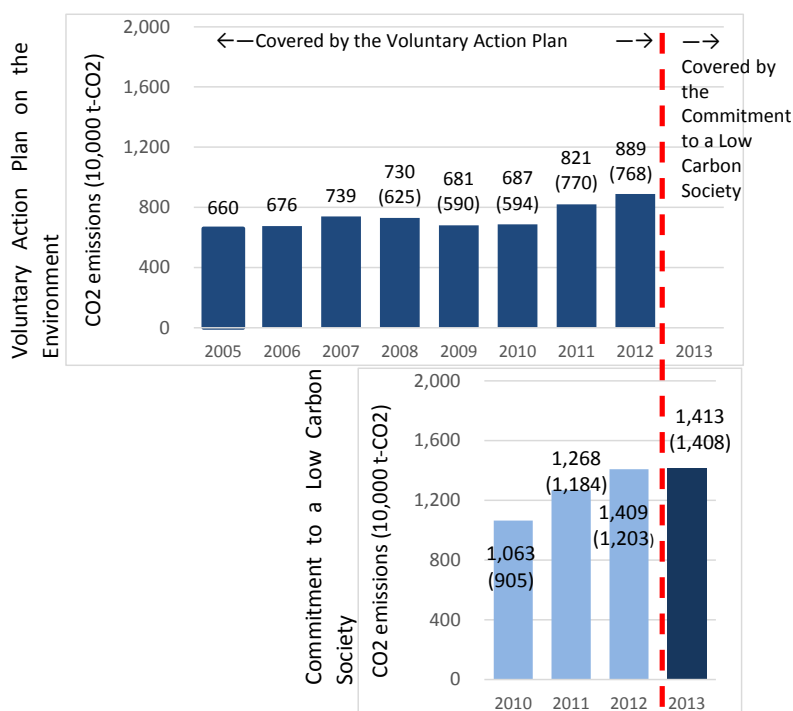
The Fiscal 2014 Follow-up revealed that the commercial sector (9 industries) emitted

14.13 million t-CO<sub>2</sub> in fiscal 2013, representing an increase of 0.3% (40,000 t-CO<sub>2</sub>) compared to fiscal 2012 levels (see Figure 6.).

The commercial sector (9 industries) emitted 14.09 million t-CO<sub>2</sub> in fiscal 2012, accounting for 5.2% of total emissions from Japan's commercial sector as a whole (272.00 million t-CO<sub>2</sub> in fiscal 2012).

Industries reported that in their efforts to reduce CO<sub>2</sub> emissions, they updated or newly installed energy-saving high-efficiency facilities and equipment, including LED lighting and high-performance air conditioning equipment and elevators. Industries were also engaged in making further improvements in the thermal insulation and the efficiency of the energy management system of buildings. Details are provided in Attachment 2.

Figure 6. CO<sub>2</sub> emissions from the commercial sector



- (Note) • The Voluntary Action Plan on the Environment was implemented through fiscal 2012, succeeded by the Commitment to a Low Carbon Society from fiscal 2013. The figures for fiscal 2010-2012 under the Commitment to a Low Carbon Society have been provided as reference.
- Calculation methods have been renewed with the implementation of the Commitment to a Low Carbon Society. Changes include calculating emissions from power generation using a power demand-end coefficient instead of a generation-end coefficient and setting revised industrial boundaries in calculating emissions from some industries.
  - Though the data of The Real Estate Companies Association of Japan are shown in the spreadsheet, CO<sub>2</sub> emission figures are not included in its. Therefore it is not in Figure.
  - CO<sub>2</sub> emissions after consideration of emission abatement based on the depreciation of credits are provided in brackets. Due to delays in UN verification of credits, the abatements based on the depreciation of credits are yet to be considered for emissions in fiscal 2013.

## B. Factor Analysis

A factor analysis was conducted to uncover the causes that led to a 0.3 % increase in CO<sub>2</sub>

emissions in the commercial sector (9 industries) in fiscal 2013 relative to fiscal 2012 (see Table 4.). From fiscal 2012 to fiscal 2013, increased economic activity and a larger CO2 emission factor respectively contributed to increased CO2 emissions by 3.6% and 0.7%, while reduced energy consumption per unit of production activity contributed to reducing CO2 emissions by 3.9%.

Table 4. Analysis of contributing factors to increases and decreases in CO2 emissions from the commercial sector in fiscal 2013<sup>\*1</sup>

	Relative to fiscal 2012
Change in economic activity <sup>*2</sup>	+3.6% (+3.9%)*4
Change in CO2 emission factor <sup>*3</sup>	+0.7% (+17.4%)
Change in energy consumed per unit of economic activity	-3.9% (-4.3%)
<b>Total</b>	<b>+0.3%</b> <b>(+17.0%)</b>

\*1 Due to the rounding of values to two decimal places, totals may differ from the sum of individual items.

\*2 The indices with the closest relation to energy consumption were selected to represent the industry's economic activity in each industry.

\*3 CO2 emissions per unit of heat output have been used for fuel, and CO2 emissions per unit of power output for electricity.

\*4 CO2 emissions after consideration of emission abatement based on the depreciation of credits are provided in brackets.

### C. Relevant efforts made by non-commercial sector industries

A variety of energy efficiency improvement measures pursued in offices are not limited to industries in the commercial sector. A diversity of efforts, such as enhancing the thermal management of air conditioning, conserving energy by frequently switching off lights, and installing high-efficiency energy-saving facilities, have been made across a wide range of industries in the industrial, energy conversion and transportation industries. As exhibited in Attachment 7, these efforts have led to the reduction of CO2 emissions per unit of floor area compared to fiscal 2012 levels in many industries.

#### (4) Transportation sector

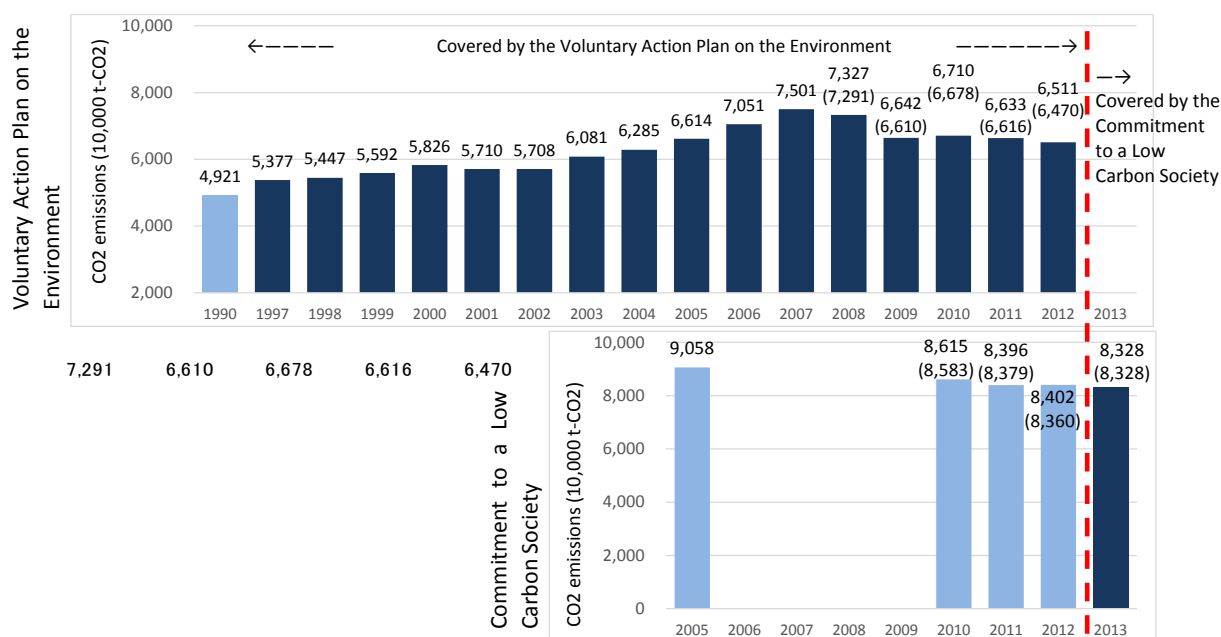
##### A. Performance

The Fiscal 2014 Follow-up revealed that the transportation sector (5 industries) emitted 83.28 million t-CO2 in fiscal 2013, representing a decrease of 0.9% (740,000 t-CO2) compared to fiscal 2012 levels. In comparison with emissions in fiscal 2005, when the Voluntary Action Plan on the Environment (Section on Global Warming Measures) had been implemented,

emissions from the sector have decreased by 8.1% (7.30 million t-CO<sub>2</sub>) (see Figure 7.).

Industries reported that in their efforts to reduce CO<sub>2</sub> emissions, they continued to update or newly install high-performance energy-saving high-efficiency facilities and equipment, including LED lighting and high-performance air conditioning equipment and elevators. Industries were also engaged in making further improvements in the thermal insulation and the efficiency of the energy management system of buildings. Details are provided in Attachment 2.

Figure 7. CO<sub>2</sub> emissions from the transportation sector



(Note) • The Voluntary Action Plan on the Environment was implemented through fiscal 2012 and succeeded by the Commitment to a Low Carbon Society from fiscal 2013. The figures for fiscal 2010-2012 under the Commitment to a Low Carbon Society have been provided as reference. (The CO<sub>2</sub> emission figure for 2005 do not include the emissions data for The Association of Japanese Private Railways.)

- Calculation methods have been renewed with the implementation of the Commitment to a Low Carbon Society. Changes include calculating emissions from power generation using a power demand-end coefficient instead of a generation-end coefficient and setting revised industrial boundaries in calculating emissions from some industries.
- CO<sub>2</sub> emissions after consideration of emission abatement based on the depreciation of credits are provided in brackets. Due to delays in UN verification of credits, the abatements based on the depreciation of credits are yet to be considered for emissions in fiscal 2013.
- CO<sub>2</sub> emission figures for The Scheduled Airlines Association of Japan in part and for those for The Japanese Shipowners' Association include overseas emissions.

## B. Factor analysis

A factor analysis was conducted to uncover the causes that led to a 0.9 % decrease in CO<sub>2</sub> emissions in the transportation sector (5 industries) in fiscal 2013 relative to fiscal 2012 (see Table 5.). From fiscal 2012 to fiscal 2013, increased economic activity and a larger CO<sub>2</sub> emission factor respectively contributed to increased CO<sub>2</sub> emissions by 12.2% and 2.7%, while



reduced energy consumption per unit of production activity contributed to reducing CO2 emissions by 15.8%.

Table 5. Analysis of contributing factors to increases and decreases in CO2 emissions from the transportation in fiscal 2013<sup>\*1</sup>

	Relative to fiscal 2012	Relative to fiscal 2005
Change in economic activity <sup>*2</sup>	+12.2% (+12.3%)*4	+14.3% (+14.3%)
Change in CO2 emission factor <sup>*3</sup>	+2.7% (+3.2%)	+2.6% (+2.6%)
Change in energy consumed per unit of economic activity	-15.8% (-15.9%)	-28.1% (-28.1%)
<b>Total</b>	<b>-0.9%</b> (-0.4%)	<b>-11.2%*5</b> (-11.2%)

\*1 Due to the rounding of values to two decimal places, totals may differ from the sum of individual items.

\*2 The indices with the closest relation to energy consumption were selected in represent the industry's economic activity in each industry.

\*3 CO2 emissions per unit of heat output have been used for fuel, and CO2 emissions per unit of power output for electricity.

\*4 CO2 emissions after consideration of emission abatement based on the depreciation of credits are provided in brackets.

\*5 Data for The Association of Japanese Private Railways were excluded from the calculation of changes relative to fiscal 2005.

### C. Relevant efforts made by non-transportation sector industries

Energy efficiency improvement measures pursued to reduce emissions from the transportation sector are not limited to industries in the transportation sector. As presented in Attachment 2, efforts including applying Japan's world-leading energy efficiency technologies to motor vehicles to achieve further improvements in fuel efficiency, consolidating distribution bases and using third-party logistics (3PL) providers to improve the efficiency of distribution practices through collaboration between distribution operators and their clients, and converting to low-emission vehicles, are also being made across a wide range of industries in the industrial, energy conversion, and commercial sectors. As shown in Attachment 8, these efforts have led to the reduction of CO2 emissions per unit of cargo transported in many industries.

## 2. Strengthened co-operation with other interested groups

### (1) Contribution through low-carbon products and services

Companies have contributed to reducing CO<sub>2</sub> emissions through their untiring efforts not only to reduce emissions from the manufacturing and production processes of their products but also to provide low-carbon products and services. Examples of their contribution to CO<sub>2</sub> emission reductions through products and services are provided in Table 6. and Attachment 3. Some industries have ensured the credibility and transparency of their calculated contributions by referring to environmental guidelines adopted by the industrial group as well as publicly known standards.

Table 6. Products and services contributing to CO<sub>2</sub> emission reductions

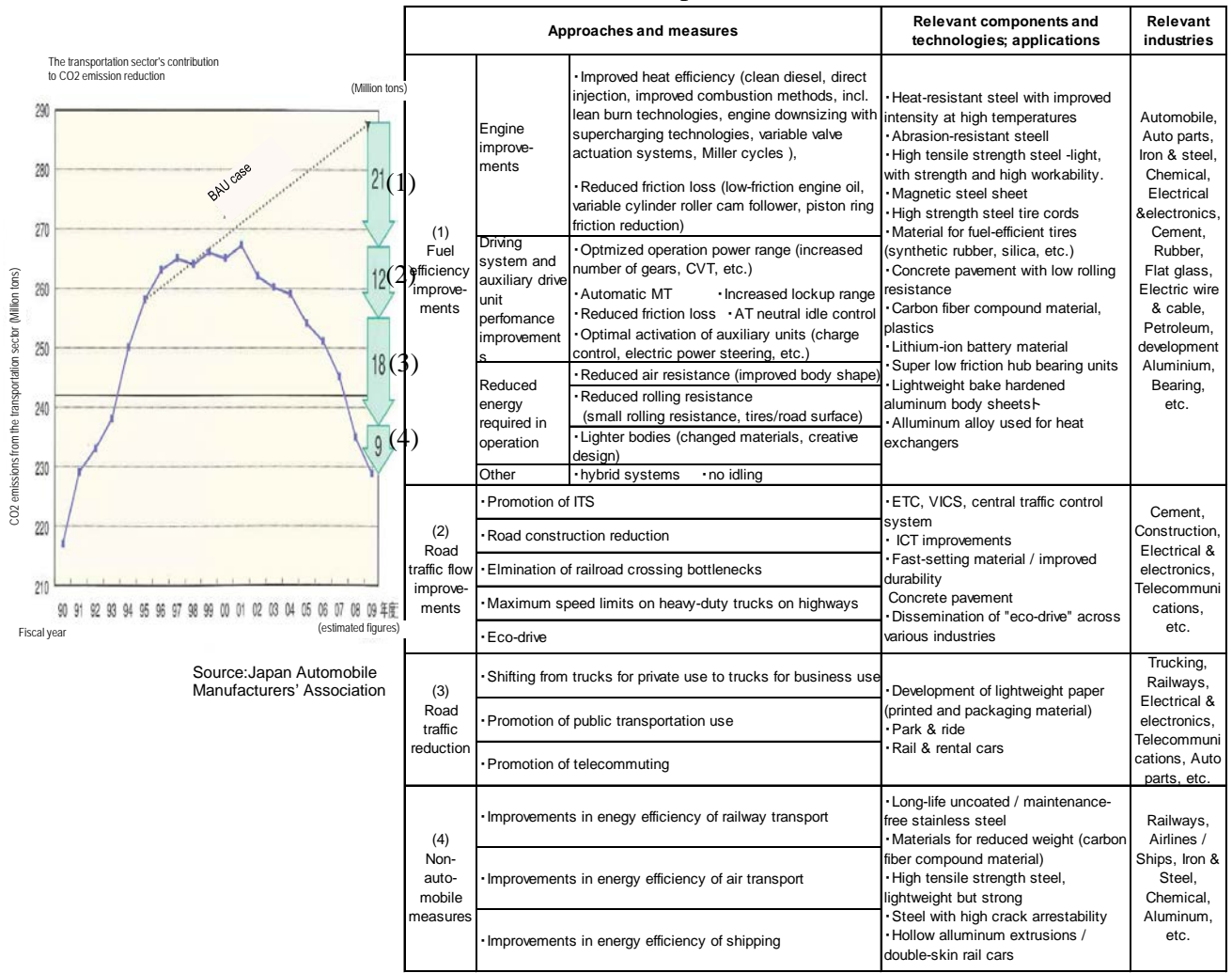
Product	Description	CO <sub>2</sub> emission reductions		
		Categories	Contribution to emission reduction (per year)	Contribution to emission reduction (total years of operation)
Electrical and electronic products	Develop calculation method to compile and evaluate the contribution made by major products and services (19 categories)	Power generation	3.31 million t-CO <sub>2</sub>	74.03 million t-CO <sub>2</sub>
		Household appliances	1.18 million t-CO <sub>2</sub>	14.19 million t-CO <sub>2</sub> (*1.98 million t-CO <sub>2</sub> attributable to parts, etc. )
		ICT products and solutions	0.94 million t-CO <sub>2</sub>	4.72 million t-CO <sub>2</sub> (*2.24 million t-CO <sub>2</sub> attributable to parts, etc. )
High-performance steel	Despite increased energy consumption compared to ordinary steel at production stage, energy-savings achieved at end-use as transformers, heat-resistant boilers, etc.	25.58 million t-CO <sub>2</sub> as of fiscal 2013		
Paper products	Produce lighter paper	Potential reductions of 520,000 tons nationwide (estimates for 10% reduction in the weight of paper products)		
Cogeneration		Fiscal 2013: approx. 110,000 t-CO <sub>2</sub> (installed capacity 71,000 kW)		
Home fuel cells (Ene-farm)		Fiscal 2013: approx. 40,000 t-CO <sub>2</sub> (installed units: 27,797)		
High-efficiency gas water heaters (Eco-Jozu / Eco-Will)		Fiscal 2013: approx. 140,000 t-CO <sub>2</sub> (installed units: 630,000)		
Natural gas shift in industrial heat demand		Fiscal 2013: approx. 330,000 t-CO <sub>2</sub> (272 million m <sup>3</sup> in boilers; 120 million m <sup>3</sup> in industrial furnaces)		
Gas air conditioning systems		Fiscal 2013: approx. 40,000 t-CO <sub>2</sub> (installed units: 140,000 RT)		
Natural gas vehicle		Fiscal 2013: approx. 10,000 t-CO <sub>2</sub> (installed units: 1,011 units)		
Inhalation aerosols	Shift from metered dose inhalation aerosols to non-fluorocarbon-based dry powder	Fiscal 2013 (relative to fiscal 2005): reductions of 90,000t (CO <sub>2</sub> equivalent)		
High-efficiency grooved copper tubes	"High-efficiency grooved copper tubes" used in heat exchangers in air conditioners	CO <sub>2</sub> emission reductions in fiscal 2013: 2.55 million t-CO <sub>2</sub>		
All-electric automatic injection molding		25% reduction in electric power consumed		
Hybrid calender roll (commercial washing machine)		finishes 50 pieces/hour; 7.7% improvement		
High-speed general-purpose in-line Pump equipped with an all-in-one controller		54% reduction in electric power consumed		
High-efficiency low-emission boilers		10% reduction in fuel consumed		
Small-sized gas-fired once-through boilers		7% reduction in CO <sub>2</sub> emissions		
Drum pump system		approximately 50% reduction in electric power consumed		
Heat exchanger		Install heat exchangers (25 stores) Fiscal 2013: 8.5 thousand t-CO <sub>2</sub>		
Freezer		Install refrigerator freezer unit with inverter technology (25 stores) Fiscal 2013: 14.5 thousand t-CO <sub>2</sub>		
Multi-layered glass	Reduce heating and cooling costs by approximately 40% by replacing single-layered glass with multi-layered glass, thereby improving heat insulation properties.	Fiscal 2013: reductions of 262 thousand t-CO <sub>2</sub> / year (estimated dissemination rate of multi-layered glass (in terms of glass coverage) in new housing is: 96.1% in stand-alone housing units and 73.2% in collective housing units)		
Self-manufacture of soft drink bottles	Reduce CO <sub>2</sub> emissions from transportation by increasing the ratio of self-manufactured PET bottles.	Reductions of approximately 31,500 t-CO <sub>2</sub> (equivalent to emissions from approximately 280,000 trucks)		
Concrete pavement	Improve fuel efficiency by changing asphalt pavement to concrete pavement, and thus reducing the rolling resistance of heavy-duty vehicles	CO <sub>2</sub> emission reductions: 1.14-6.56 kg (Load capacity: 11t / running distance: 100km) (Fuel consumed when running the same distance: 95.4-99.2%)		
Sanitary equipment	Reduce CO <sub>2</sub> emission at end-use by conserving water, etc. <sup>14</sup>	Item	CO <sub>2</sub> emission reductions (relative to conventional products)	
		Warm water flushing toilet seat	127kg-CO <sub>2</sub>	
		Prefabricated bath for stand-alone housing	167/125 kg-CO <sub>2</sub> (hot water saving / push-button faucet)	

Also, relevant industries work together beyond industrial boundaries to reduce society-wide CO2 emissions by providing high-quality products and services.

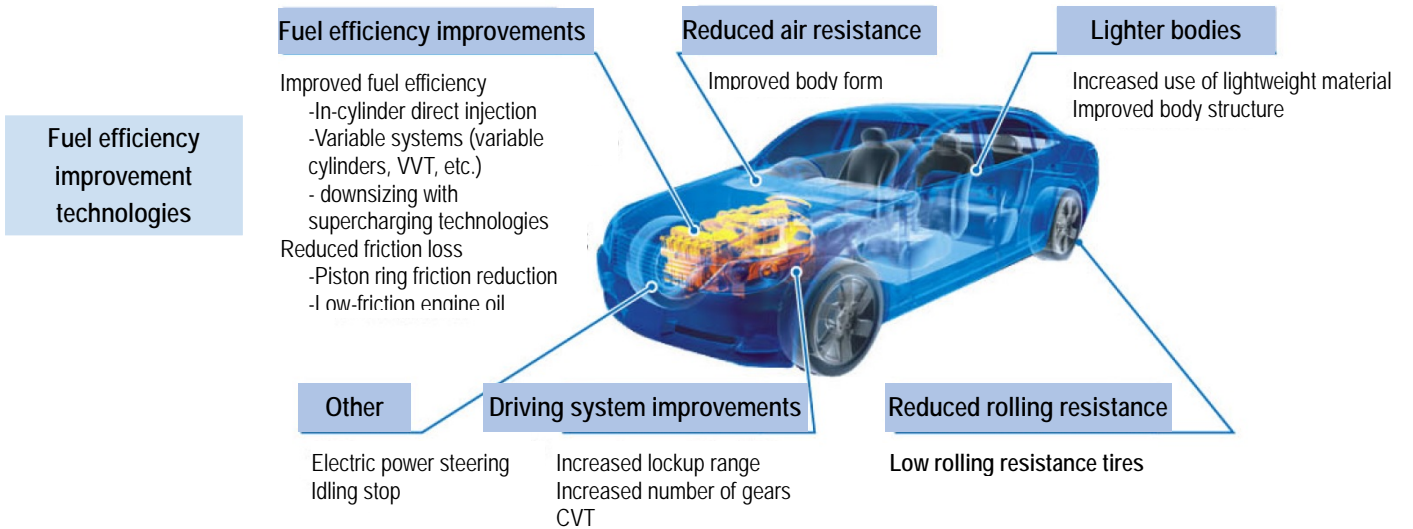
For example, as exhibited in Table 7, in the transportation sector, a number of industries are engaged in a concerted effort to reduce CO2 emissions by 1) improving the fuel efficiency of vehicles; 2) improving road traffic flows; 3) reducing traffics; and 4) other non-automobile-related efforts.

Furthermore, as presented in Table 8, in the commercial and residential sector, contributions to reduce CO2 emissions are made by improving the energy efficiency of buildings, installing energy management systems, and developing and disseminating high-efficiency energy-saving equipment.

Table 7. Inter-industrial co-operation in providing products and services that contribute to CO2 emission reductions (transportation sector)



Source: Japan Automobile Manufacturers' Association

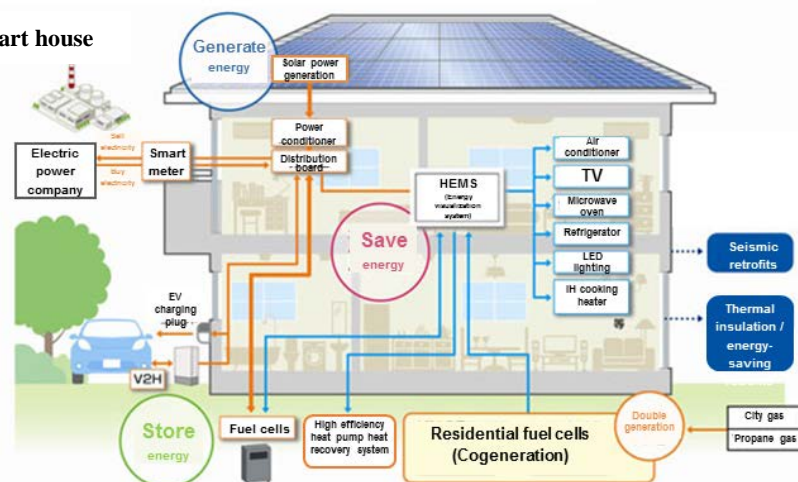


Source: Japan Automobile Manufacturers' Association

Table 8. Inter-industrial co-operation in providing products and services that contribute to CO2 emission reductions (commercial and residential sectors)

Approaches and measures		Relevant components and technologies; applications		Relevant industries
Equipment	High-efficiency equipment	Lighting equipment	<ul style="list-style-type: none"> <li>• inverter control, dimming control</li> <li>• LED material (phosphors, sealing material, platforms)</li> <li>• HVAC DC motor material (Hole elements, Hole IC)</li> </ul>	Electrical & electronics, Chemical, Iron & steel, Aluminium, Copper, Bearing, Real estate, Buildings, Construction, Housing, Sanitary equipment, etc.
		Heating equipment	<ul style="list-style-type: none"> <li>• Low torque, long-life bearings with grease seals</li> <li>• Vacuum insulated material (urethane, silica, etc.)</li> <li>• High-efficiency compressor, high-efficiency transformers</li> <li>• High-efficiency heat pump heat recovery systems</li> </ul>	
		HVAC equipment	<ul style="list-style-type: none"> <li>• Reduced stand-by electricity, additional "eco-mode" functions</li> </ul>	
Facilities	Energy savings through application of energy-efficient design and construction material	Thermal insulation, absorption, and shielding	<ul style="list-style-type: none"> <li>• Heat-resistant steel, thermal insulation material (polystyrene, urethane, etc.)</li> <li>• Plastic sash material (polyvinyl chloride)</li> <li>• Thermal insulation paint and film</li> <li>• Sunlight control for blinds</li> </ul>	Real estate, Buildings, Construction, Housing, Electric power, Gas, Petroleum, Chemical, Iron and steel, Aluminium, Copper, Rubber, Flat glass, Electric wire and cable, etc.
		Utilization of nature	<ul style="list-style-type: none"> <li>• High-performance external wall insulation, installation of louvers and awnings</li> <li>• High performance thermal insulation / shielding glass, double-skin facades</li> </ul>	
		High-efficiency energy equipment	<ul style="list-style-type: none"> <li>• Passive design (daylighting, ventilation, ground thermal, etc.)</li> <li>• Greening (ground, roof, walls), automated watering systems</li> </ul>	
	Creation and efficient use of energy	Energy creation	<ul style="list-style-type: none"> <li>• Cogeneration (boilers, turbines), power generators engines, storage batteries, fuel cells, etc.)</li> <li>• Fuel cell material (solid oxide fuel cell material, etc.)</li> </ul>	
		Energy storage	<ul style="list-style-type: none"> <li>• Photovoltaic and solar thermal power generation, wind generation</li> <li>• Utilization of regenerated electric power</li> </ul>	
Region	Efficient use of energy through large-scale use	<ul style="list-style-type: none"> <li>• Regional heat supply systems</li> <li>• Inter-building power interchange systems</li> <li>• Load leveling through diversified use</li> </ul>	Real estate, Buildings, Construction, Housing, Electric power, Gas, Petroleum, Cement, etc	
	Utilization of unharnessed energy	<ul style="list-style-type: none"> <li>• Industrial exhaust heat utilization</li> <li>• Unharnessed energy utilization (sewerage, rivers, underground, etc.)</li> <li>• Smart house, smart city</li> </ul>		
Systems	Optimal energy use	Installment of management systems (homes, buildings, areas)	<ul style="list-style-type: none"> <li>• Micro-sensing technologies</li> <li>• Communication technologies (wired / wireless)</li> </ul>	Electrical & electronics, Telecommunications, etc.
		Sensors	<ul style="list-style-type: none"> <li>• Control systems, smart meters</li> </ul>	
Dissemination & promotion	Energy-efficient products	Utilization of environmental performance assessment tools	<ul style="list-style-type: none"> <li>• Utilization of environmental performance indices for buildings (CASBEE, BELS, etc.) / energy-saving labels for electronic and electrical labels)</li> </ul>	Real estate, Buildings, Construction, Housing, Banks, Rubber, etc.
	Financial measures, procurement	Optimal settings of lighting and HVAC	<ul style="list-style-type: none"> <li>• Preferential loans</li> <li>• Green procurement</li> <li>• Information-sharing with users and council meetings</li> </ul>	
Other	3R	Longer life	<ul style="list-style-type: none"> <li>• Equipment, buildings, infrastructure, etc.</li> </ul>	Construction, Housing, Cement, Paper, Food manufacturing, etc.
		Reduce	<ul style="list-style-type: none"> <li>• High-durability concrete, wooden fireproof buildings</li> <li>• Reduced products, containers and packaging</li> </ul>	
		Reuse	<ul style="list-style-type: none"> <li>• Recycled concrete / asphalt / plastics</li> <li>• Recycling (corrugated cardboard, food waste composting, steel cans)</li> </ul>	
		Recycle	<ul style="list-style-type: none"> <li>• Reuse of wood waste from construction, use of domestic forest thinnings</li> </ul>	

Conceptual drawing of a smart house

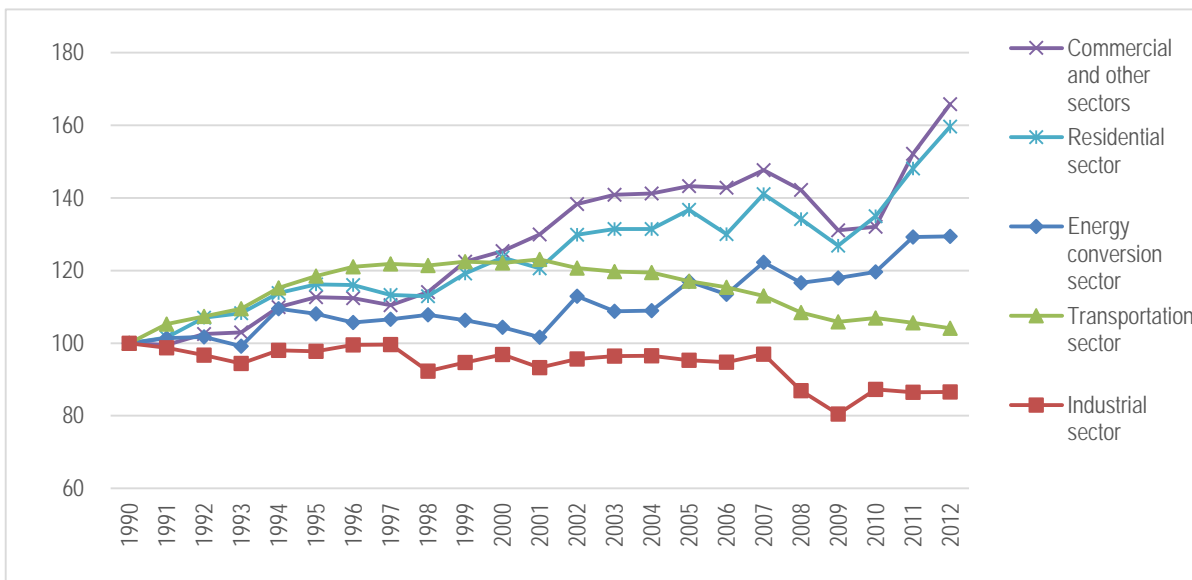


(2) Efforts leading to public campaigns

It is also essential that each individual reexamine his/her attitudes and actions towards global warming issues, and adapt his/her lifestyles accordingly with a view to resolve them. To this end, public-private co-operation in promoting public campaigns is called for.

According to the Fiscal 2014 Follow Up results, public relations campaigns and educational activities (hosting events and expositions, environmental education outreach to students and local residents, etc.) as well as the communication of energy-saving information (by using websites, distributing pamphlets, providing product performance information at retail stores, etc.) were implemented so that increased public awareness and knowledge of global warming prevention may encourage the proactive use of energy-efficient low-carbon products and services, etc. Furthermore, the business community was engaged in continued efforts to implement a wide range of activities, including adopting a casual dress code (Cool Biz / Warm Biz), strictly controlling air conditioning and lighting, encouraging the keeping of environmental household account books, and promoting eco-commuting and no idling, which engage employees and their families in preventing global warming on a daily basis, and thus lead to the promotion of public campaigns.

(Reference) CO2 emissions from energy consumption in Japan, by sector (fiscal 1990 =100)

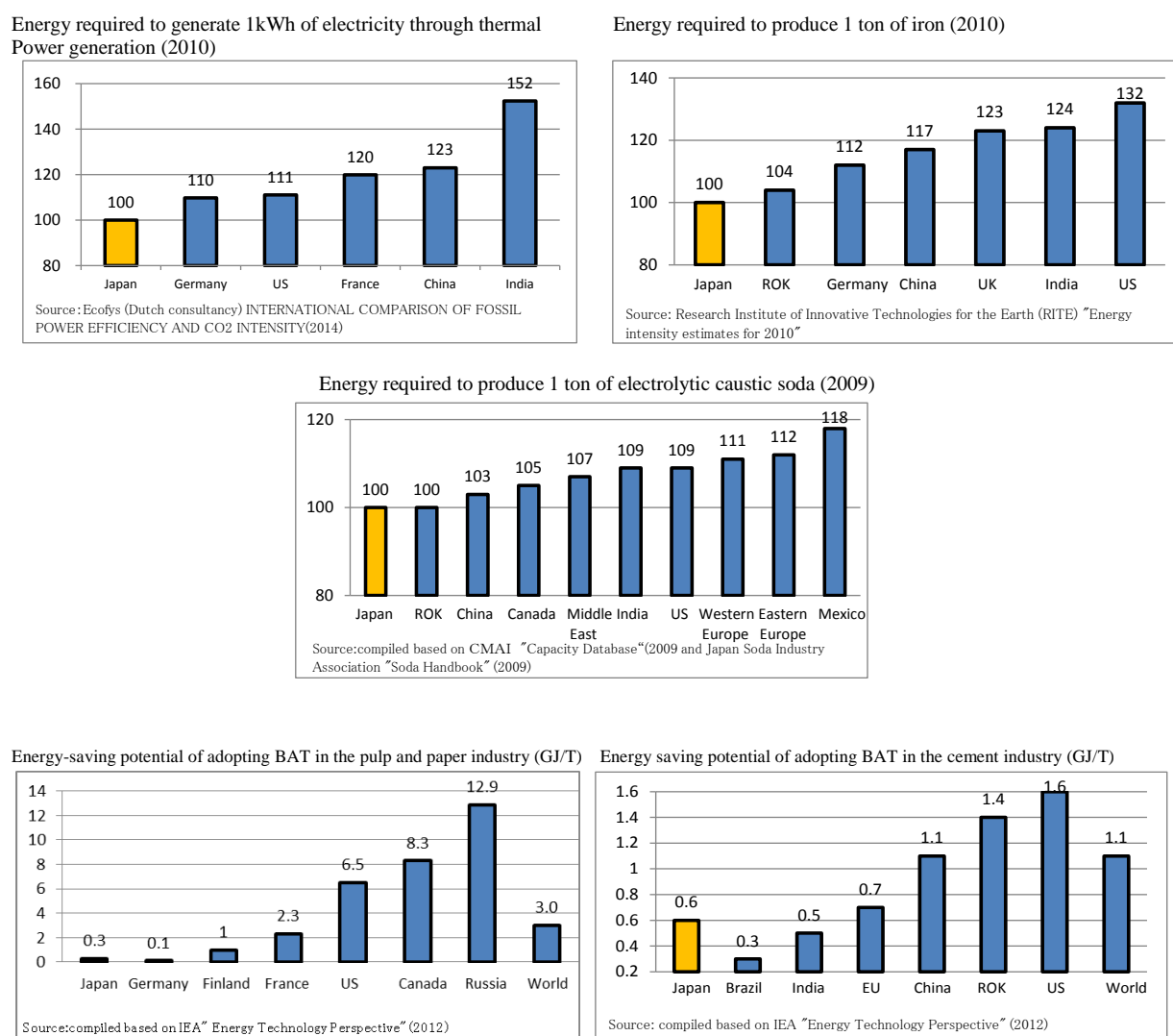


Source: National Institute of Environmental Studies (NIES) ‘The GHGs Emissions Data of Ja

### 3. Promoting contribution on the international level

Under the Voluntary Action Plan on the Environment (Section on Global Warming Measures), Japan's business community has contributed to the establishment of the world's leading low-carbon society through the development and dissemination of energy-efficient low-carbon technologies and products characterized by high quality and performance. According to international comparisons of energy efficiency conducted by participating industries, world-leading levels of energy efficiency have been continuously achieved in all participating industries that carried out comparisons (see Figure 8).

Figure 8. International comparisons of energy efficiency



As Japan accounts for only 2.6% of the world's greenhouse gas emissions (2010), it is also essential that global warming countermeasures are implemented at a global level.

From this perspective, many industries reported various efforts (moving manufacturing

processes overseas, importing products, fostering human resources in developing countries, etc.) to disseminate Japan's advanced energy-efficient low-carbon technologies and products overseas in the Fiscal 2014 Follow-up, as presented in Attachment 4. Industries have also engaged in activities at international conferences (cooperating towards the formulation of international standards, introducing Japan's diverse global warming measures, etc.) and contributed to the implementation of anti-pollution measures, such as those against air and water contamination.

#### 4. Development of innovative technologies

To promote measures in the above three pillars in the medium- to long-term, it is essential that participating industries develop innovative technologies. According to the results of the Fiscal 2014 Follow-up, industries have been engaged in efforts to develop innovative technologies and to work on practical applications, as presented in Attachment 5. Examples of the achievements made in fiscal 2013 are provided in Table 9.

Table 9. Examples of innovative technology developments in fiscal 2013 (examples)

Industry	Achievements in fiscal 2013 (examples)
Japan Iron and Steel Federation	<ul style="list-style-type: none"> <li>Completed basic plans for the construction of a 10m<sup>3</sup> trial blast furnace under the CO2 Ultimate Reduction in Steelmaking Process by Innovative Technology for Cool Earth 50 (COURSE50), sponsored by NEDO.</li> </ul>
Japan Chemical Industry Association	<ul style="list-style-type: none"> <li>Achieved the world's highest conversion efficiency level of over 10% for organic thin film solar cells.</li> <li>Achieved the world's highest mobility level for single wall carbon nano-tube thin film transistor (CNT-TFT).</li> </ul>
Japan Paper Association	<ul style="list-style-type: none"> <li>Successfully manufactured the first transparent continuous sheet of cellulose nano fiber (CNF) as a result of joint research between a member company and a diversified chemical company. Widely promoted CNF development, including the starting of operations at a demonstrative CNF manufacturing facility and the promotion of developing of new applications, including thickeners and packaging by one company; and the provision of samples of various CNF initiated by another company.</li> </ul>
Japan Automobile Manufacturers' Association / Japan Auto-Body Industries Association	<ul style="list-style-type: none"> <li>New release of 26 next-generation models (EV, PHEV, HEV), including minor model changes</li> </ul>
Japan Soft Drink Association	<ul style="list-style-type: none"> <li>Shifted heat source from "steam" to "methods using electrical heating. (actual performance: 33% reduction in CO2 emissions)</li> </ul>
The Japan Bearing Industrial Association	<ul style="list-style-type: none"> <li>Developed system products for electric vehicles (EV) using motor control technologies fostered through the developments of magnetic bearing technologies and tested such technologies in social experiments using EVs converted from gasoline to electric power.</li> </ul>



Japan Association of Rolling Stock Industries	<ul style="list-style-type: none"> <li>• Contributed to environmental conservation by newly developing and using the “efWING,”rolling stock bogie, significantly lighter than conventional models, thus enabling energy cost reductions.</li> <li>• Reduced fuel efficiency by more than 20% compared to conventional diesel cars by developing a self-charging battery-powered railway car that applies a lithium-ion battery to a hybrid diesel engine. This system is equipped with a function that can store the electricity generated by regenerative braking in a storage battery.</li> <li>• Provided SiC (Silicon Carbide) power semiconductor modules loaded with a SBD for household appliances, industrial equipment and railway rolling stock devices and succeeded in the world’s first practical application of an inverter using the newly developed large-capacity full SiC power module suitable for use in a DC1500V electrification system. This inverter reduces electric power loss by approximately 55% and volume/weight by approximately 65% compared to conventional devices.</li> </ul>
Japan Gas Association	<ul style="list-style-type: none"> <li>• Promoted cogeneration technology development. Successfully operated a pressurized SOFC-MGT hybrid power generation system for 4,000 consecutive hours for the first time in the world.</li> </ul>
Telecommunications Carriers Association	<ul style="list-style-type: none"> <li>• Promoted the development of lasers capable of data transmission. In fiscal 2013, developed a technology that reduced the energy consumption for 1-bit data transmission to 5.5 fJ*3, or less than one-tenth that of conventional surface-emitting lasers.</li> </ul>

## 5. Efforts made beyond the four pillars

In the Fiscal 2104 Follow-up, industries reported efforts made beyond the four pillars: (1) the 3Rs and global warming countermeasures; (2) reducing non-CO2 GHG emissions; (3) fostering and conserving forest sinks; (4) utilizing renewable energy; and (5) implementing environmental management and environmental conservation activities in overseas business operations. An outline of these efforts is provided below (details can be found in Attachment 6).

### (1) The 3Rs and global warming countermeasures

Efforts to foster a recycling society by promoting the 3Rs (reduce, reuse and recycle) for the fostering of a recycling society can also contribute to the promotion of global warming measures. In the Fiscal 2014 Follow-up, industries reported reductions in transport energy use enabled by reducing waste and using thinners and lighter containers and reducing CO2 emissions by utilizing waste and byproducts.

Efforts to promote the 3Rs can sometimes increase CO2 emissions. For example, the cement industry contributes to reducing the total volume of waste undergoing final disposal in Japan as a whole by accepting sewerage sludge and other waste and byproducts from other industries, but the utilization of waste requires energy for pretreatment and thus increases CO2 emissions. As indicated in such examples, it should be noted that pursuing only CO2 emission reductions and undermining the 3Rs could result in other problems such as increased final disposal volumes in Japan as a whole.

### (2) Reducing the emission of non-CO2 greenhouse gases

Greenhouse gases include not only CO2 but also methane (CH4), dinitrogen monoxide (N2O), sulfur hexafluoride (SF6) and fluorocarbons (HFCs and PFCs)<sup>4</sup>, the emissions of which must be controlled in order to cope with global warming. In the Fiscal 2014 Follow-up, industries reported emission reductions of fluorocarbons through the revision of work processes, the enhancement of daily inspections, and the scheduled renewal of facilities. Other efforts, including preventing fluorocarbon leakages, thoroughly recovering and destroying fluorocarbons and considering the use of natural refrigerants, were also reported.

### (3) Fostering and conserving forest sinks

Global warming countermeasures also call for the fostering and conservation of forest sinks. In the Fiscal 2014 Follow-up, industries reported their involvement in forest management activities, including the expanded use of tree thinnings and domestic lumber, the management

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<sup>4</sup> Approximately 5% of greenhouse gas emissions in Japan are attributable to non-CO2 gases (fiscal 2012).

of corporate forests and the greening of factories and offices, and the promotion of domestic and overseas afforestation projects.

(4) The utilization of renewable energy

Renewable energy sources are important from the perspective of global warming countermeasures as they do not emit CO<sub>2</sub> when generating electricity. In the Fiscal 2014 Follow-up, industries reported efforts including in-house generation and utilization of electric power using solar power, wind power, geothermal power, micro hydropower and biomass. Some companies sold electric power to other companies, but when electric power is sold under a feed-in-tariff system, environmental value is sold with the electricity generated from renewable energy sources and belongs to the user who shoulders the tariff, instead of to the power generator.

(5) Environmental management and environmental conservation activities in overseas business operations

Many companies have acquired ISO14001 certification at their business locations and are performing business operations under more environment-friendly and efficient circumstances. Many companies have also formulated environmental guidelines and promote environmental business management.

Many companies not only implement their domestic environmental management systems overseas but also conduct various environmental conservation activities in collaboration with local communities.

### Conclusion: Policies towards the future

Keidanren will continue to join hands with industries participating in Keidanren's Commitment to Low Carbon Society to make sure that global warming countermeasures are implemented. It will also conduct evaluations in the Evaluation Committee (the meeting for this Follow-up is to be held in spring 2015) and firmly promote the Commitment to a Low Carbon Society, responding to the indications made by the Evaluation Committee. Furthermore, in fiscal 2016, it will conduct an extensive interim review based on the achievements made from fiscal 2013 to 2015.

In international negotiations on climate change, an international post-2020 framework that will apply to all countries is to be agreed upon before December 2015 at COP21.

Therefore in July 2014, Keidanren will launch Phase II of the Commitment to a Low Carbon Society towards 2030, with a view to further contribute to long-term global warming countermeasures on a global scale through enhanced efforts.

Keidanren will set up targets for CO<sub>2</sub> emissions from domestic business operations in 2030, in addition to existing targets for 2020, as well as reinforce its efforts to the maximum extent possible in strengthening co-operation among interested groups, promoting contribution on the international level and developing innovative technologies.

In order to ensure the effectiveness, transparency and credibility of the Commitment to a Low Carbon Society, Keidanren will continue to pursue the PDCA cycle. Given that the 2030 targets for domestic business operations are to be achieved in the long-term, various factors, including social and industrial changes and the progress made in technological innovation, will be considered, while explicitly presenting the preconditions and ensuring transparency.

Information will also be communicated both domestically and internationally regarding co-operation among interested groups, international contribution, innovative technology development, and other contributions to global warming countermeasures.

The Government is currently considering its Intended Nationally Determined Contributions and global warming countermeasures. Quantitative targets must be set up (1) in light of a potential energy mix that will support Japan's growth strategy; and (2) taking a bottom-up approach which is based on building up on individual efforts and which is not obsessed with the rate of reduction relative to a particular baseline year.

In terms of domestic measures, the Government should consider Keidanren's Commitment to a Low Carbon Society to be the pillar of measures taken by the business community from the perspective of implementing effective global warming countermeasures. Cap and trade schemes should not be introduced because they can: (i) hinder corporate efforts to take product lifecycle-based approaches; and (ii) stagnate research and development by enabling the achievement of targets through the purchase of permits. The feed-in-tariff scheme

for renewable energy and the Tax for Climate Change Mitigation (Carbon Tax) absorb funds which could otherwise be used for the development and diffusion of advanced technologies, and thus must be fundamentally reviewed. In the household sector, ambitious targets should be set up for public campaigns, which should be proactively promoted under the initiative of the Prime Minister and the Minister of the Environment, as well as by consistently following a PDCA cycle.

## Trends in Transportation Sectors

## Industrial Sector

10,000t-CO<sub>2</sub>; 10,000kl, crude oil equivalents, fiscal

Industrial	*1,*2,*3 (☆: target defined by the industry)	Base year	2005	2009	2010	2011	2012	2013	Compared to FY2005	Compared to FY2012
The Japan Iron and Steel Federation	CO <sub>2</sub> emissions (excluding credits)		18,832	16,794	18,914	18,633	18,996	19,443	3.2%	2.4%
	CO <sub>2</sub> emissions (with credits) ☆		18,832	16,633	18,715	18,525	18,734	19,439	3.2%	3.8%
	CO <sub>2</sub> emissions intensity (excluding credits)		0.90	0.93	0.91	0.94	0.95	0.93	2.9%	-1.9%
	CO <sub>2</sub> emissions intensity (with credits)		0.90	0.92	0.90	0.93	0.93	0.93	2.9%	-0.6%
	Energy consumption		5,901	5,262	5,935	5,778	5,815	5,907	0.1%	1.6%
	Energy consumption intensity		0.90	0.92	0.91	0.93	0.92	0.90	-0.2%	-2.7%
	Production activity index		1.03	0.90	1.03	0.98	0.99	1.04		
Japan Chemical Industry Association	CO <sub>2</sub> emissions (excluding credits) ☆		6,828	6,176	6,372	6,302	6,199	6,286	-7.9%	1.4%
	CO <sub>2</sub> emissions (with credits)		6,828	6,008	6,181	6,203	5,964	6,286	-7.9%	5.4%
	CO <sub>2</sub> emissions intensity (excluding credits)	FY2005	1.00	1.03	1.01	1.03	1.04	1.03	2.5%	-1.8%
	CO <sub>2</sub> emissions intensity (with credits)		1.00	1.00	0.98	1.02	1.00	1.03	2.5%	2.1%
	Energy consumption		2,907	2,670	2,774	2,621	2,512	2,523	-13.2%	0.4%
	Energy consumption intensity	FY2005	1.00	1.04	1.04	1.01	0.99	0.97	-3.4%	-2.7%
	Production activity index		1.00	0.94	0.98	0.96	0.94	0.96		
Japan Paper Association	CO <sub>2</sub> emissions (excluding credits) ☆		2,491	1,973	1,902	1,888	1,858	1,858	-25.4%	0.0%
	CO <sub>2</sub> emissions (with credits)		2,491	1,938	1,864	1,869	1,814	1,858	-25.4%	2.4%
	CO <sub>2</sub> emissions intensity (excluding credits)		0.88	0.81	0.77	0.79	0.80	0.77	-12.7%	-3.5%
	CO <sub>2</sub> emissions intensity (with credits)		0.88	0.79	0.75	0.78	0.78	0.77	-12.7%	-1.2%
	Energy consumption		888	705	686	657	629	622	-29.9%	-1.1%
	Energy consumption intensity		0.84	0.77	0.74	0.74	0.72	0.69	-18.0%	-4.6%
	Production activity index		1.09	0.94	0.96	0.92	0.90	0.93		
Liaison Group of Japanese Electrical and Electronics Industries for Global Warming Prevention *4	CO <sub>2</sub> emissions (excluding credits)		1,804	1,665	1,653	1,805	1,344	1,285		-4.4%
	CO <sub>2</sub> emissions (with credits)		1,804	1,467	1,451	1,704	1,177	1,284		9.1%
	CO <sub>2</sub> emissions intensity (excluding credits)	FY2012					1.00	0.93		-7.4%
	CO <sub>2</sub> emissions intensity (with credits)						1.00	1.06		5.6%
	Energy consumption		1,010	980	974	890	597	563		-5.7%
	Energy consumption intensity ☆	FY2012					1.00	0.91		-8.7%
	Production activity index					1.00	1.03			
Japan Cement Association	CO <sub>2</sub> emissions (excluding credits)		2,188	1,755	1,662	1,712	1,769	1,808	-17.4%	2.2%
	CO <sub>2</sub> emissions (with credits)		2,188	1,743	1,649	1,705	1,750	1,808	-17.4%	3.3%
	CO <sub>2</sub> emissions intensity (excluding credits)		1.00	1.01	1.00	1.00	1.00	0.98	-1.8%	-2.6%
	CO <sub>2</sub> emissions intensity (with credits)		1.00	1.01	0.99	1.00	0.99	0.98	-1.8%	-1.6%
	Energy consumption		656	525	499	510	523	541	-17.6%	3.4%
	Energy consumption intensity ☆		0.94	0.96	0.95	0.94	0.94	0.92	-2.2%	-1.5%
	Production activity index		0.79	0.63	0.60	0.62	0.64	0.67		
Japan Automobile Manufacturers Association, Inc. / Japan Auto-Body Industries Association, Inc.	CO <sub>2</sub> emissions (excluding credits) ☆		794	581	610	649	735	725	-8.8%	-1.3%
	CO <sub>2</sub> emissions (with credits)		794	534	560	624	667	724	-8.8%	8.6%
	CO <sub>2</sub> emissions intensity (excluding credits)		0.71	0.65	0.64	0.68	0.72	0.65	-7.9%	-9.3%
	CO <sub>2</sub> emissions intensity (with credits)		0.71	0.60	0.59	0.65	0.66	0.65	-7.9%	-0.2%
	Energy consumption		398	317	332	313	332	322	-19.1%	-2.8%
	Energy consumption intensity	FY2005	1.00	1.00	0.98	0.92	0.91	0.82	-18.3%	-10.7%
	Production activity index		1.13	0.90	0.96	0.97	1.03	1.12		
Japan Auto Parts Industries Association	CO <sub>2</sub> emissions (excluding credits)		739	545	595	682	756	759	2.7%	0.4%
	CO <sub>2</sub> emissions (with credits)		739	493	537	650	674	759	2.6%	12.6%
	CO <sub>2</sub> emissions intensity (excluding credits) ☆		0.78	0.59	0.59	0.66	0.71	0.69	-11.9%	-2.4%
	CO <sub>2</sub> emissions intensity (with credits)		0.78	0.53	0.53	0.63	0.63	0.69	-11.9%	9.4%
	Energy consumption		384	299	327	325	333	330	-14.0%	-0.8%
	Energy consumption intensity		0.77	0.61	0.62	0.60	0.59	0.57	-26.2%	-3.6%
	Production activity index		1.24	1.22	1.32	1.35	1.40	1.44		
Japan Mining Industry Association	CO <sub>2</sub> emissions (excluding credits)		395	376	374	409	444	450	13.9%	1.5%
	CO <sub>2</sub> emissions (with credits)		395	351	348	395	408	450	13.8%	10.2%
	CO <sub>2</sub> emissions intensity (excluding credits) ☆		0.84	0.81	0.79	0.92	0.92	0.87	3.5%	-5.3%
	CO <sub>2</sub> emissions intensity (with credits)		0.84	0.76	0.74	0.89	0.85	0.87	3.5%	2.9%
	Energy consumption		161	161	161	159	162	163	1.0%	0.2%
	Energy consumption intensity		0.84	0.84	0.83	0.87	0.82	0.83	-0.8%	1.0%
	Production activity index		1.14	1.13	1.15	1.09	1.17	1.16		
Japan Federation of Construction Contractors	CO <sub>2</sub> emissions (excluding credits)		532	462	396	398	403	411	-22.8%	2.1%
	CO <sub>2</sub> emissions (with credits)		532	450	382	391	389	411	-22.8%	5.7%
	CO <sub>2</sub> emissions intensity (excluding credits) ☆		0.87	0.88	0.87	0.88	0.86	0.82	-6.1%	-5.2%
	CO <sub>2</sub> emissions intensity (with credits)		0.87	0.86	0.84	0.87	0.83	0.82	-6.1%	-1.9%
	Energy consumption		229	193	169	162	157	159	-30.8%	1.2%
	Energy consumption intensity		0.84	0.82	0.83	0.80	0.75	0.71	-15.8%	-6.1%
	Production activity index		0.64	0.55	0.48	0.48	0.49	0.53		

Industrial	*1,*2,*3 (☆: target defined by the industry)	Base year	2005	2009	2010	2011	2012	2013	Compared to FY2005	Compared to FY2012	
Japan Federation of Housing Organizations	CO2 emissions (excluding credits)		409	259	256	266	273	281	-31.3%	3.1%	
	CO2 emissions (with credits)		409	259	256	266	273	281	-31.3%	3.1%	
	CO2 emissions intensity (excluding cred		0.99	0.99	0.90	0.91	0.89	0.83	-16.0%	-6.2%	
	CO2 emissions intensity (with credits)		0.99	0.99	0.90	0.91	0.89	0.83	-16.0%	-6.2%	
	Energy consumption		137	100	99	103	105	108	-20.8%	3.1%	
	Energy consumption intensity		0.87	1.00	0.91	0.92	0.90	0.84	-3.2%	-6.2%	
	Production activity index		0.79	0.50	0.55	0.56	0.59	0.65			
Lime Manufacture Association	CO2 emissions (excluding credits) ☆		308	244	268	234	227	247	-19.9%	8.4%	
	CO2 emissions (with credits)		308	241	264	232	223	247	-19.9%	10.4%	
	CO2 emissions intensity (excluding cred		0.86	0.78	0.76	0.74	0.76	0.78	-9.8%	2.7%	
	CO2 emissions intensity (with credits)		0.86	0.77	0.75	0.74	0.74	0.78	-9.8%	4.7%	
	Energy consumption		106	87	96	83	79	84	-20.2%	6.2%	
	Energy consumption intensity		0.86	0.81	0.79	0.76	0.77	0.77	-10.1%	0.7%	
	Production activity index		1.00	0.88	0.99	0.88	0.84	0.89			
The Japan Rubber Manufacturers Association*1	CO2 emissions (excluding credits)		212	167	177	179	167	162	-23.6%	-3.1%	
	CO2 emissions (with credits)		212	147	156	195	185	204	-3.8%	10.0%	
	CO2 emissions intensity (excluding cred	☆	FY2005	1.00	0.98	0.91	0.91	0.91	0.87	-12.9%	-4.5%
	CO2 emissions intensity (with credits)			1.00	0.87	0.80	0.99	1.01	1.10	9.7%	8.3%
	Energy consumption			113	98	105	105	99	95	-15.2%	-4.0%
	Energy consumption intensity			FY2005	1.00	1.09	1.01	1.00	1.02	0.97	-3.3%
	Production activity index			1.00	0.80	0.92	0.93	0.86	0.88		
The Federation of Pharmaceutical Manufacturers' Associations of Japan	CO2 emissions (excluding credits) ☆		237	203	202	226	248	244	2.8%	-1.8%	
	CO2 emissions (with credits)		237	188	187	217	227	244	2.8%	7.4%	
	CO2 emissions intensity (excluding cred		0.89	0.68	0.67	0.71	0.77	0.72	-19.2%	-6.1%	
	CO2 emissions intensity (with credits)		0.89	0.63	0.62	0.69	0.70	0.72	-19.2%	2.8%	
	Energy consumption		115	108	108	108	112	109	-5.5%	-2.9%	
	Energy consumption intensity		0.91	0.76	0.75	0.71	0.72	0.67	-25.8%	-7.1%	
	Production activity index		1.58	1.76	1.80	1.89	1.93	2.02			
Japan Aluminium Association	CO2 emissions (excluding credits)		167	131	137	144	147	141	-15.6%	-4.0%	
	CO2 emissions (with credits)		167	122	128	139	135	141	-15.6%	4.1%	
	CO2 emissions intensity (excluding cred		0.96	0.88	0.84	0.95	1.01	0.98	1.8%	-3.0%	
	CO2 emissions intensity (with credits)		0.96	0.82	0.78	0.91	0.93	0.98	1.7%	5.2%	
	Energy consumption		81	69	73	69	67	63	-21.5%	-5.2%	
	Energy consumption intensity ☆		0.94	0.93	0.90	0.91	0.92	0.89	-5.3%	-4.2%	
	Production activity index		1.12	0.96	1.05	0.98	0.94	0.93			
Japan Federation of Printing Industries*5	CO2 emissions (excluding credits) ☆		132	124	125	143	147	142	7.6%	-3.4%	
	CO2 emissions (with credits)		132	112	113	136	131	142	7.5%	8.4%	
	CO2 emissions intensity (excluding cred		FY2010	1.16	0.97	1.00	1.16	1.20	1.18	2.2%	-1.5%
	CO2 emissions intensity (with credits)			1.28	0.98	1.00	1.23	1.18	1.31	2.1%	10.6%
	Energy consumption			72	70	71	70	66	63	-13.0%	-5.2%
	Energy consumption intensity			FY2010	1.12	0.97	1.00	1.01	0.96	0.93	-17.3%
	Production activity index			0.91	1.01	1.00	0.98				
Flat Glass Manufacturers Association of Japan	CO2 emissions (excluding credits) ☆		135	110	115	117	113	116	-13.8%	2.7%	
	CO2 emissions (with credits)		135	107	113	116	110	116	-13.9%	5.8%	
	CO2 emissions intensity (excluding cred		1.03	1.15	1.03	1.10	0.99	0.93	-10.0%	-7.0%	
	CO2 emissions intensity (with credits)		1.03	1.12	1.01	1.08	0.97	0.93	-10.0%	-4.2%	
	Energy consumption		52	44	46	45	43	44	-16.7%	1.1%	
	Energy consumption intensity		1.00	1.14	1.03	1.06	0.95	0.87	-13.0%	-8.5%	
	Production activity index		0.72	0.53	0.62	0.59	0.63	0.69			
Japan Soft Drink Association	CO2 emissions (excluding credits)		106	102	103	109	115	117	10.6%	1.7%	
	CO2 emissions (with credits)		106	97	98	106	109	117	10.6%	8.2%	
	CO2 emissions intensity (excluding cred		1.17	1.02	0.97	0.99	1.03	0.96	-18.3%	-6.4%	
	CO2 emissions intensity (with credits) ☆		1.17	0.97	0.92	0.96	0.96	0.96	-18.3%	-0.4%	
	Energy consumption		51	53	54	53	54	55	6.9%	0.8%	
	Energy consumption intensity		1.27	1.19	1.13	1.08	1.08	1.00	-21.0%	-7.3%	
	Production activity index		1.92	2.11	2.25	2.34	2.39	2.59			
Japan Dairy Industry Association	CO2 emissions (excluding credits)		111	109	109	114	120	115	3.5%	-4.2%	
	CO2 emissions (with credits)		111	104	103	111	113	115	3.5%	2.0%	
	CO2 emissions intensity (excluding cred		1.17	1.20	1.19	1.21	1.25	1.19	2.2%	-4.1%	
	CO2 emissions intensity (with credits)		1.17	1.15	1.13	1.18	1.17	1.19	2.2%	2.1%	
	Energy consumption		51	54	54	52	53	50	-2.7%	-5.5%	
	Energy consumption intensity ☆		1.14	1.24	1.25	1.18	1.16	1.10	-4.0%	-5.5%	
	Production activity index		1.09	1.04	1.05	1.08	1.11	1.11			

Industrial	*1,*2,*3 (☆: target defined by the industry)	Base year	2005	2009	2010	2011	2012	2013	Compared to FY2005	Compared to FY2012
The Japanese Electric Wire & Cable Makers' Association	CO2 emissions (excluding credits)		91	78	81	94	99	96	5.5%	-3.1%
	CO2 emissions (with credits)		91	68	71	89	87	96	5.4%	10.9%
	(metal (copper/aluminum) cable) CO2 emissions intensity (excluding credits)		1.06	1.08	1.14	1.28	1.37	1.29	22.2%	-5.3%
	(metal (copper/aluminum) cable) CO2 emissions intensity (with credits)		1.06	0.96	1.00	1.21	1.20	1.29	22.1%	8.0%
	(optical fiber cable) CO2 emissions intensity (excluding credits)		0.27	0.22	0.24	0.26	0.26	0.28	4.6%	6.2%
	(optical fiber cable) CO2 emissions intensity (with credits)		0.27	0.19	0.21	0.25	0.22	0.28	4.5%	23.4%
	(metal (copper/aluminum) cable) Energy consumption ☆		45.4	37.8	39.8	38.1	36.4	35.1	-22.7%	-3.6%
	(optical fiber cable) Energy consumption		4.9	6.9	6.9	7.2	7.0	6.4	29.3%	-8.4%
	(metal (copper/aluminum) cable) Energy consumption intensity		1.00	1.06	1.12	1.06	1.03	0.96	-4.0%	-6.6%
	(optical fiber cable) Energy consumption intensity ☆		0.24	0.20	0.22	0.20	0.18	0.19	-21.9%	4.8%
	(metal (copper/aluminum) cable) Production activity index		0.73	0.57	0.57	0.58	0.57	0.59		
(optical fiber cable) Production activity index		14.4	23.6	22.0	25.0	27.2	23.8			
The Japan Bearing Industrial Association	CO2 emissions (excluding credits)		73	58	70	83	84	84	15.2%	0.6%
	CO2 emissions (with credits)		73	51	62	79	73	84	15.1%	14.7%
	CO2 emissions intensity (excluding cred		0.97	0.96	0.89	1.03	1.14	1.12	15.2%	-1.4%
	CO2 emissions intensity (with credits)	FY1997	0.97	0.85	0.78	0.97	1.00	1.12	15.1%	12.4%
	CO2 emissions intensity (fixity coefficient) ☆		0.87	0.87	0.80	0.78	0.78	0.77	-10.9%	-1.5%
	Energy consumption		40	33	40	40	37	37	-8.9%	-0.6%
	Energy consumption intensity	FY1997	0.85	0.88	0.81	0.79	0.80	0.78	-8.9%	-2.6%
Production activity index		1.33	1.06	1.39	1.42	1.30	1.33			
The Japan Society of Industrial Machinery Manufacturers	CO2 emissions (excluding credits)		64	51	54	62	65	64	-0.8%	-2.0%
	CO2 emissions (with credits)		64	46	48	59	58	64	-0.8%	10.5%
	CO2 emissions intensity (excluding cred	2008-2012 Average	1.10	0.91	0.98	1.05	1.11	1.11	1.0%	0.0%
	CO2 emissions intensity (with credits)		1.22	0.90	0.97	1.10	1.09	1.23	0.9%	12.7%
	Energy consumption		34	28	30	30	29	28	-19.2%	-3.6%
	Energy consumption intensity ☆	2008-2012 Average	1.15	0.99	1.07	0.98	0.96	0.94	-17.8%	-1.7%
	Production activity index		1.00	0.97	0.94	1.01	1.00	0.99		
Japan Petroleum Development Association	CO2 emissions (excluding credits) ☆		22	27	25	23	25	24	7.9%	-5.0%
	CO2 emissions (with credits)		22	27	24	23	25	24	7.9%	-2.0%
	CO2 emissions intensity (excluding cred		0.79	0.85	0.83	0.78	0.91	1.01	27.4%	11.1%
	CO2 emissions intensity (with credits) ☆		0.79	0.83	0.81	0.77	0.88	1.01	27.4%	14.6%
	Energy consumption		9	10	10	10	10	10	16.9%	-3.7%
	Energy consumption intensity		0.80	0.80	0.85	0.89	0.97	1.10	38.1%	12.7%
Production activity index		1.75	2.00	1.85	1.84	1.73	1.48			
Japan Copper and Brass Association	CO2 emissions (excluding credits)		42	38	41	44	47	47	10.7%	-0.2%
	CO2 emissions (with credits)		42	35	37	42	42	47	10.7%	11.8%
	CO2 emissions intensity (excluding cred		1.00	1.10	1.05	1.21	1.35	1.27	26.8%	-6.3%
	CO2 emissions intensity (with credits)		1.00	0.99	0.95	1.15	1.21	1.27	26.8%	5.0%
	Energy consumption		23	22	23	22	21	21	-10.1%	-1.5%
	Energy consumption intensity		1.00	1.13	1.09	1.08	1.11	1.03	3.0%	-7.5%
Production activity index		1.00	0.83	0.93	0.87	0.82	0.87			
Brewers Association of Japan	CO2 emissions (excluding credits)		90	60	57	56	57	55	-39.3%	-4.5%
	CO2 emissions (with credits)		90	57	54	55	54	55	-39.4%	0.7%
	CO2 emissions intensity (excluding cred		0.79	0.56	0.54	0.51	0.50	0.49	-38.8%	-3.4%
	CO2 emissions intensity (with credits)		0.79	0.53	0.51	0.54	0.53	0.54	-31.9%	2.2%
	Energy consumption		43	32	30	28	28	26	-39.4%	-5.2%
	Energy consumption intensity ☆		0.79	0.62	0.60	0.57	0.56	0.54	-31.7%	-3.3%
Production activity index		0.98	0.92	0.90	0.88	0.88	0.87			
The Shipbuilders' Association of Japan and the Cooperative Association of Japan (man- Shipbuilders (man- (quantity at completion) (man- (quantity at completion)	CO2 emissions (excluding credits)						68	65		-3.8%
	CO2 emissions (with credits)						60	65		9.5%
	CO2 emissions intensity (excluding cred						1.00	1.06		5.5%
	CO2 emissions intensity (with credits) ☆						1.00	1.05		5.5%
	CO2 emissions intensity (excluding cred						1.00	1.17		16.5%
	CO2 emissions intensity (with credits) ☆						1.00	1.16		16.5%
	Energy consumption						29.0	27.6		-5.1%
	Energy consumption intensity						1.00	1.04		4.1%
Energy consumption intensity						1.00	1.15		15.0%	
Production activity index						1.00	0.83			
Limestone Association of Japan	CO2 emissions (excluding credits) ☆		25	20	21	24	27	28	13.3%	4.7%
	CO2 emissions (with credits)		25	19	19	23	25	28	13.2%	15.2%
	CO2 emissions intensity (excluding cred	FY2010	0.98	1.00	1.00	1.12	1.20	1.20	22.3%	0.2%
	CO2 emissions intensity (with credits)		0.98	0.92	0.92	1.08	1.09	1.20	22.3%	10.2%
	Energy consumption		12	10	11	11	11	12	-5.0%	3.7%
	Energy consumption intensity	FY2010	0.96	0.99	1.00	0.99	0.99	0.98	2.6%	-0.8%
Production activity index		1.20	0.97	1.00	1.01	1.06	1.11			



Industrial	*1,*2,*3 (☆: target defined by the industry)	Base year	2005	2009	2010	2011	2012	2013	Compared to FY2005	Compared to FY2012
Japan Sanitary Industry Equipment Association	CO2 emissions (excluding credits)	☆	36	26	23	28	26	25	-31.1%	-3.1%
	CO2 emissions (with credits)		36	24	22	27	24	25	-31.1%	4.8%
	CO2 emissions intensity (excluding credits)		0.68	0.56	0.45	0.51	0.47	0.41	-39.6%	-12.9%
	CO2 emissions intensity (with credits)		0.68	0.53	0.42	0.50	0.44	0.41	-39.6%	-5.7%
	Energy consumption		17	13	12	13	12	11	-34.7%	-4.4%
	Energy consumption intensity		0.69	0.62	0.50	0.52	0.46	0.40	-42.8%	-14.0%
	Production activity index		1.07	0.92	1.07	1.08	1.10	1.22		
Flour Millers Association	CO2 emissions (excluding credits)		23	22	23	28	31	31	30.9%	-0.4%
	CO2 emissions (with credits)		23	19	20	27	26	31	30.8%	16.0%
	CO2 emissions intensity (excluding credits)	☆	1.06	1.03	1.03	1.27	1.40	1.39	30.9%	-0.9%
	CO2 emissions intensity (with credits)		1.06	0.88	0.88	1.19	1.20	1.39	30.8%	15.5%
	Energy consumption		13	13	14	14	13	13	-2.2%	-1.8%
	Energy consumption intensity		0.97	0.97	0.97	0.98	0.97	0.95	-2.1%	-2.2%
	Production activity index		1.17	1.14	1.18	1.18	1.16	1.17		
Japan Industrial Vehicles Association	CO2 emissions (excluding credits)	☆	6.9	4.4	4.9	5.9	5.6	4.6	-33.3%	-17.1%
	CO2 emissions (with credits)		6.9	4.0	4.4	5.6	5.0	4.6	-33.3%	-8.0%
	CO2 emissions intensity (excluding credits)		1.14	1.33	1.09	1.19	1.19	1.00	-12.0%	-16.2%
	CO2 emissions intensity (with credits)		1.14	1.23	1.00	1.13	1.07	1.00	-12.0%	-7.0%
	Energy consumption		3.6	2.4	2.7	2.8	2.5	2.0	-43.9%	-18.5%
	Energy consumption intensity		1.13	1.38	1.14	1.08	1.01	0.84	-26.0%	-17.7%
	Production activity index		0.93	0.50	0.68	0.75	0.71	0.70		
Japan Machine Tool Builders' Association	CO2 emissions (excluding credits)		27	20	26	32	35	36	34.4%	2.8%
	CO2 emissions (with credits)		27	17	23	30	31	36	34.3%	17.5%
	CO2 emissions intensity (excluding credits)		0.84	1.41	1.08	1.15	1.23	1.31	57.2%	6.7%
	CO2 emissions intensity (with credits)		0.84	1.24	0.95	1.08	1.08	1.31	57.2%	22.0%
	Energy consumption		15	11	15	15	15	15	4.9%	1.5%
	Energy consumption intensity	☆	0.78	1.36	1.05	0.94	0.91	0.96	22.8%	5.3%
	Production activity index		1.29	0.56	0.95	1.10	1.14	1.10		
Japan Association of Rolling Stock Industries	CO2 emissions (excluding credits)	☆	3.7	3.5	3.5	3.6	3.6	3.6	-1.7%	-0.4%
	CO2 emissions (with credits)		3.7	3.1	3.1	3.5	3.2	3.6	-1.7%	12.8%
	CO2 emissions intensity (excluding credits)		0.55	0.42	0.47	0.55	0.61	0.50	-9.5%	-18.6%
	CO2 emissions intensity (with credits)		0.55	0.38	0.42	0.52	0.54	0.50	-9.6%	-7.9%
	Energy consumption		2.0	2.0	2.0	1.7	1.6	1.6	-22.0%	-1.9%
	Energy consumption intensity		0.55	0.43	0.49	0.47	0.49	0.39	-28.2%	-19.9%
	Production activity index		1.43	1.80	1.59	1.44	1.27	1.56		
Emissions from industrial processes *6	CO2 emissions		4,934	3,956	4,019	4,007	4,036	4,360	-11.6%	8.0%
Revisions *1	CO2 emissions (excluding credits)		23	24	25	44	54	53		
	CO2 emissions (with credits)		23	33	34	21	20	11		
	Energy consumption									
Total *1,*7	CO2 emissions (excluding credits)		41,884	36,163	38,443	38,544	38,724	39,566	-5.7%	2.2%
	CO2 emissions (with credits)		41,884	35,355	37,545	38,074	37,650	39,560	-5.7%	5.1%
	Energy consumption		13,575	12,019	12,797	12,334	11,992	12,045	-11.5%	0.4%

\*1 CO2 emissions and energy consumption are calculated using conversion coefficiente(user-end) of average of all electric power production source .  
The Japan Rubber Manufacturers adopt a heat basic unit method (cogeneration reflects an effect) and calculate conversion coefficiente(user-end, fixity coefficient at FY2005) of average of all electric power production source.

Revisions are defined as the differences between the totals of data submitted by industries and the totals of the revised industry figures.

\*2 Due to a revision in General Energy Statistics, calculations of emissions before fiscal 1990, 2000-2004, 2005-2012, and after 2013 are based on differen conversion coefficients of Gross Calorific Value and Carbon Emission Factor .

A gas normal state after 2013 in General Energy Statistics is changed from STP to SATP, but does not revise it.

\*3 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. Each industry set the base year, and intensity is calculated figure at base year as a denominator. The base year is 1990 without comments in base year column.

\*4 The CO2 emission figures for the electrical and electronics industry in fiscal 2011 and the years preceding used for emission calculations under the Commitment to a Low Carbon Society are equivalent to those used in the Voluntary Action Plan on the Environment.

\*5 The Japan Federation of Printing Industries was shifted from the industrial sector to the commercial sector .

## Trends in Transportation Sectors

## Energy-Conversion Sector

10,000t-CO<sub>2</sub>; 10,000kl, crude oil equivalents, fiscal

業種	*1,*2,*3 (☆: target defined by the industry)	remarks column	2005	2006	2007	2008	2009	2010	2011	2012	2013	Compare d to	Compare d to
The Federation of Electric Power Industry of Japan	CO <sub>2</sub> emissions (excluding credits)		37,300	36,500	41,700	39,500	35,300	37,400	43,900	48,600	48,400	+29.8%	-0.4%
	CO <sub>2</sub> emissions (with credits)		37,300	36,500	41,700	33,200	30,100	31,700	40,900	41,500	48,300	+29.5%	+16.4%
	CO <sub>2</sub> emissions intensity (excluding credits)		1.01	0.98	1.09	1.06	0.99	0.99	1.22	1.37	1.37	+34.8%	-0.2%
	CO <sub>2</sub> emissions intensity (with credits)		1.01	0.98	1.09	0.89	0.84	0.84	1.14	1.17	1.37	+34.8%	+17.0%
	Energy consumption	pro forma	13,600	13,500	15,500	14,600	13,200	13,600	16,600	18,300	18,100	+33.1%	-1.1%
	Energy consumption intensity		0.95	0.94	0.94	0.93	0.93	0.93	0.93	0.93	0.92	-3.7%	-1.4%
	Production activity index		1.34	1.35	1.40	1.35	1.30	1.37	1.31	1.29	1.29		
Portion attributed to power industry: figures	CO <sub>2</sub> emissions (excluding credits)		3,850	3,700	4,250	3,960	3,560	3,650	4,300	4,610	4,610	+19.7%	+0.0%
	CO <sub>2</sub> emissions (with credits)		3,850	3,700	4,250	3,330	3,030	3,100	4,010	3,930	4,610	+19.7%	+17.3%
	Energy consumption	pro forma	1,410	1,370	1,580	1,470	1,330	1,330	1,630	1,740	1,730	+22.7%	-0.6%
Petroleum Association of Japan	CO <sub>2</sub> emissions (excluding credits)		4,142	4,068	4,175	4,064	3,946	3,989	3,772	3,807	4,023	-2.9%	+5.7%
	CO <sub>2</sub> emissions (with credits)		4,142	4,068	4,175	4,046	3,931	3,972	3,763	3,783	4,023	-2.9%	+6.3%
	CO <sub>2</sub> emissions intensity (excluding credits)		0.84	0.85	0.85	0.86	0.85	0.84	0.84	0.85	0.86	+1.3%	+0.7%
	CO <sub>2</sub> emissions intensity (with credits)		0.84	0.85	0.85	0.85	0.84	0.84	0.84	0.84	0.86	+1.3%	+1.3%
	Energy consumption	☆	1,714	1,682	1,725	1,688	1,633	1,651	1,556	1,575	1,646	-4.0%	+4.5%
	Energy consumption intensity		0.84	0.85	0.85	0.86	0.85	0.84	0.84	0.85	0.84	+0.1%	-0.4%
The Japan Gas Association*4	Production activity index		1.58	1.55	1.58	1.53	1.50	1.52	1.44	1.44	1.52		
	CO <sub>2</sub> emissions (excluding credits)		46	38	40	37	34	34	38	39	45	-2.3%	+15.1%
	CO <sub>2</sub> emissions (with credits)		46	38	40	34	31	31	36	36	45	-2.4%	+26.8%
	CO <sub>2</sub> emissions intensity (excluding credits)	☆	0.17	0.13	0.13	0.12	0.11	0.11	0.12	0.12	0.13	-21.0%	+6.0%
	CO <sub>2</sub> emissions intensity (with credits)		0.17	0.13	0.13	0.11	0.11	0.10	0.11	0.11	0.13	-21.0%	+16.8%
	Energy consumption		25	21	21	20	19	19	19	18	21	-16.1%	+13.6%
	Energy consumption intensity	☆	0.18	0.14	0.14	0.13	0.13	0.12	0.12	0.11	0.12	-32.1%	+4.6%
Emissions from industrial processes *5	Production activity index		2.10	2.20	2.33	2.25	2.21	2.33	2.38	2.39	2.59		
	CO <sub>2</sub> emissions		214	246	250	256	222	214	213	190	189	-11.8%	-0.8%
Total *1	CO <sub>2</sub> emissions (excluding credits)		8,252	8,051	8,716	8,317	7,762	7,887	8,323	8,646	8,867	+7.5%	+2.6%
	CO <sub>2</sub> emissions (with credits)		8,252	8,051	8,716	7,665	7,214	7,317	8,022	7,939	8,867	+7.4%	+11.7%
	Energy consumption		3,148	3,073	3,326	3,178	2,982	2,999	3,204	3,333	3,396	+7.9%	+1.9%

\*1 CO<sub>2</sub> emissions and energy consumption are calculated using conversion coefficients (user-end) of average of all electric power production source.

\*2 Due to a revision in General Energy Statistics, calculations of emissions before fiscal 1990, 2000-2004, 2005-2012, and after 2013 are based on different conversion coefficients of Gross Calorific Value and Carbon Emission Factor. A gas normal state after 2013 in General Energy Statistics is changed from STP to SATP, but does not revise it.

\*3 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. Each industry set the base year, and intensity is calculated figure at base year as a denominator. The base year is 1990 without comments in base year column.

\*4 CO<sub>2</sub> emission figures from the Voluntary Action Plan on the Environment (note: industrial boundaries have been revised) have been used to represent the Japan Gas Association for emission calculations under the Commitment to a Low Carbon Society in fiscal 2012 and the years preceding.

\*5 "Emissions from industrial processes" refers to CO<sub>2</sub> emitted by non-energy sources in the course of the manufacturing process.

## Trends in Transportation Sectors

## Commercial Sector

10,000t-CO<sub>2</sub>; 10,000kl, crude oil equivalents, fiscal

業種	*1,*2,*3,*4 (☆: target defined by the industry)	Base year	2010	2011	2012	2013	Compared to FY2012
Telecommunications Carriers Association	CO2 emissions (excluding credits)		426	533	578	574	-0.7%
	CO2 emissions (with credits)		362	498	493	573	+16.4%
	Energy consumption		257	260	251	246	-2.0%
	Energy consumption intensity ☆		1.00	0.97	0.90	0.85	-5.1%
Japan Franchise Association	CO2 emissions (excluding credits)		297	365	424	440	+3.9%
	CO2 emissions (with credits)		252	340	361	440	+21.8%
	Energy consumption		179	178	184	189	+2.5%
Japan Association of Refrigerated Warehouses	CO2 emissions (excluding credits)		80	91	107	107	+0.1%
	CO2 emissions (with credits)		68	85	91	107	+17.4%
	CO2 emissions intensity (excluding cr		0.91	1.08	1.23	1.21	-1.6%
	CO2 emissions intensity (with credits)		0.78	1.01	1.04	1.21	+15.4%
	Energy consumption		48	44	46	46	-1.2%
	Energy consumption intensity ☆		0.86	0.82	0.83	0.81	-2.9%
	Production activity index		1.40	1.35	1.40	1.43	
Japanese Bankers Association	CO2 emissions (excluding credits)		122	131	142	140	-1.3%
	CO2 emissions (with credits)		103	122	121	140	+15.7%
	Energy consumption		73	64	62	61	-1.1%
	Energy consumption intensity ☆		0.99	0.86	0.84	0.83	-0.8%
The Life Insurance Association of Japan	CO2 emissions (excluding credits)		105	113	120	115	-4.3%
	CO2 emissions (with credits)		91	106	104	115	+10.1%
	Energy consumption ☆		61	54	53	50	-5.7%
Japan Foreign Trade Council, Inc.	CO2 emissions (excluding credits)		4.5	4.6	4.8	4.7	-2.8%
	CO2 emissions (with credits)		3.8	4.3	4.1	4.7	+13.4%
	Energy consumption ☆		2.7	2.3	2.1	2.1	+0.3%
The General Insurance Association of Japan	CO2 emissions (excluding credits)		27	28	31	30	-2.5%
	CO2 emissions (with credits)		23	27	27	30	+12.5%
	Energy consumption		16	14	13	13	-3.8%
	Energy consumption intensity ☆	FY2009	1.01	0.87	0.85	0.85	-0.2%
Japan LP Gas Association	CO2 emissions (excluding credits)		2.4	2.9	3.2	3.1	-2.9%
	CO2 emissions (with credits)		2.0	2.7	2.7	3.1	+13.8%
	CO2 emissions intensity (excluding cr		0.97	1.16	1.39	1.45	+3.7%
	CO2 emissions intensity (with credits)		0.83	1.08	1.19	1.44	+21.6%
	Energy consumption		1.4	1.4	1.4	1.3	-4.2%
	Energy consumption intensity ☆		0.91	0.88	0.94	0.97	+2.4%
	Production activity index		0.99	1.00	0.93	0.87	
The Real Estate Companies Association of Japan	CO2 emissions (excluding credits)	FY2005	0.86	0.89	0.97	0.99	+2.2%
	CO2 emissions (with credits)		0.75	0.84	106.82	0.99	-99.1%
	Energy consumption intensity ☆	FY2005	0.88	0.79	0.79	0.78	-1.1%
Total *1	CO2 emissions (excluding credits)		1,064	1,269	1,410	1,414	+0.3%
	CO2 emissions (with credits)		906	1,185	1,310	1,414	+7.9%
	Energy consumption		638	617	613	608	-0.9%

\*1 CO2 emissions and energy consumption are calculated using conversion coefficient(user-end) of average of all electric power production source .

\*2 Due to a revision in General Energy Statistics, calculations of emissions before fiscal 1990, 2000-2004, 2005-2012, and after 2013 are based on differen conversion coefficients of Gross Calorific Value and Carbon Emission Factor .A gas normal state after 2013 in General Energy Statistics is changed from STP to SATP, but does not revise it

\*3 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 Each industry set the base year, and intensity is calculated figure at base year as a denominator. The base year is 1990 without comments in base year column.

\*4 The Japan Federation of Printing Industries was shifted from the industrial sector to the commercial sector .

## Trends in Transportation Sectors

## Transportation Sector

10,000t-CO2; 10,000kl, crude oil equivalents, fiscal

Industry	*1, *2, *3 (☆: target defined by the industry)	Base year	2005	2010	2011	2012	2013	Compared to FY2005	Compared to FY2012
The Japanese Shipowners' Association	CO2 emissions (excluding credits)		5,585	5,780	5,685	5,511	5,328	-4.6%	-3.3%
	CO2 emissions (with credits)		5,585	5,780	5,685	5,511	5,328	-4.6%	-3.3%
	CO2 emissions intensity (excluding credit: ☆)		0.88	0.83	0.77	0.73	0.60	-31.4%	-17.9%
	CO2 emissions intensity (with credits)		0.88	0.83	0.77	0.73	0.60	-31.4%	-17.9%
	Energy consumption		2,012	2,083	2,048	1,986	1,860	-7.6%	-6.3%
	Energy consumption intensity		0.88	0.83	0.77	0.73	0.58	-33.5%	-20.5%
	Production activity index		1.65	1.79	1.91	1.95	2.29		
The Japanese Shipowners' Association	CO2 emissions (excluding credits)		4,727	4,344	4,100	3,856	3,784	-20.0%	-1.9%
	CO2 emissions (with credits)		4,727	4,344	4,100	3,856	3,784	-20.0%	-1.9%
	CO2 emissions intensity (excluding credit: ☆)	FY1996	0.75	0.63	0.63	0.67	0.64	-15.5%	-4.3%
	CO2 emissions intensity (with credits)		0.75	0.63	0.63	0.67	0.64	-15.5%	-4.3%
	Energy consumption		1,776	1,632	1,540	1,449	1,421	-20.0%	-1.9%
	Energy consumption intensity	FY1996	0.75	0.63	0.63	0.67	0.64	-15.5%	-4.3%
	Production activity index		1.25	1.37	1.30	1.16	1.18		
The Scheduled Airlines Association of Japan	CO2 emissions (excluding credits)		2,669	1,902	1,754	1,885	1,979	-25.9%	+5.0%
	CO2 emissions (with credits)		2,669	1,902	1,754	1,885	1,979	-25.9%	+5.0%
	CO2 emissions intensity (excluding credit: ☆)		0.97	0.86	0.86	0.86	0.85	-12.0%	-1.0%
	CO2 emissions intensity (with credits)		0.97	0.86	0.86	0.86	0.85	-12.0%	-1.0%
	Energy consumption		1,026	731	674	724	748	-27.0%	+3.3%
	Energy consumption intensity		0.96	0.85	0.85	0.86	0.84	-12.5%	-1.6%
	Production activity index		1.60	1.29	1.19	1.27	1.35		
Japan Federation of Coastal Shipping Associations	CO2 emissions (excluding credits) ☆		790	705	687	705	722	-8.7%	+2.4%
	CO2 emissions (with credits)		790	705	687	705	722	-8.7%	+2.4%
	CO2 emissions intensity (excluding credits)		1.04	1.09	1.10	1.11	1.09	+4.6%	-1.4%
	CO2 emissions intensity (with credits)		1.04	1.09	1.10	1.11	1.09	+4.6%	-1.4%
	Energy consumption		288	256	250	256	255	-11.5%	-0.5%
	Energy consumption intensity		1.04	1.09	1.09	1.10	1.06	+1.4%	-4.2%
	Production activity index		0.88	0.75	0.73	0.74	0.77		
The Association of Japanese Private Railways	CO2 emissions (excluding credits)			216	258	289	287		-0.8%
	CO2 emissions (with credits)			183	241	247	287		+16.3%
	CO2 emissions intensity (excluding credit: ☆)			1.00	1.20	1.33	1.32		-0.3%
	CO2 emissions intensity (with credits)			1.00	1.12	1.13	1.32		+16.9%
	Energy consumption			130	126	126	123		-2.1%
	Energy consumption intensity			1.00	0.97	0.96	0.96		-0.1%
All Japan Freight Forwarders Association	CO2 emissions (excluding credits) ☆		14	13	13	13	13	-9.4%	-0.4%
	CO2 emissions (with credits)		14	13	13	13	13	-9.4%	-0.4%
	Energy consumption		5.3	4.8	4.8	4.8	4.8	-9.5%	-0.4%
Total *1*4	CO2 emissions (excluding credits)		13,785	12,959	12,496	12,258	12,112	-14.2%	-1.2%
	CO2 emissions (with credits)		13,785	12,926	12,479	12,216	12,111	-14.2%	-0.9%
	Energy consumption		5,107	4,837	4,643	4,546	4,413	-13.6%	-2.9%

\*1 CO2 emissions and energy consumption are calculated using conversion coefficient(user-end) of average of all electric power production source.

\*2 Due to a revision in General Energy Statistics, calculations of emissions before fiscal 1990, 2000-2004, 2005-2012, and after 2013 are based on different conversion coefficients of Gross Calorific Value and Carbon Emission Factor. A gas normal state after 2013 in General Energy Statistics is changed from STP to SATP, but does not revise it.

\*3 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. Each industry set the base year, and intensity is calculated figure at base year as a denominator. The base year is 1990 without comments in base year column.

\*4 Change rate of FY2013 relative to FY 2005 do not include the emissions data for the Association of Japanese Private Railways.

Cases of efforts for Emission reductions made by domestic business operations

## 1. Industrial Sector

Industry	Efforts for Emission reductions made by domestic business operations
The Japan Iron and Steel Federation	(1) Enhanced the waste heat recovery rate and the efficiency level of equipment (2) Established clean coal technologies by utilizing desulfurization technologies (3) Comprehensively improved the energy efficiency of manufacturing plants by switching most of the energy used from coal to byproducts gases and waste energy (steam, electricity, etc) (4) Saved energy by recycling resources (waste plastics, waste tire)
Japan Chemical Industry Association	<Past efforts> (1) Continued to engage in energy saving efforts to improve energy intensity levels and achieved the target set up under the Voluntary Action Plan on the Environment <Efforts made in fiscal 2013> (1) Improved operation methods (2) Recovered waste energy (3) Streamlined processes (4) Improved the efficiency of equipment and appliances (5) Converted fuels
Japan Paper Association	<Past efforts> (1) Made an investments in energy savings and fuel conversion efforts and thus reduced fossil fuels <Efforts made in fiscal 2013> (1) Paper-making section • Modified the press section • Introduced a stationary syphon for use on dryers and improved the drainage system (2) Electric power generating equipment • Improved the efficiency such as turbines; installed a waste heat recovery device and enhanced black liquor devices (3) Pulping section • Renewed pulp screens (4) Others • Improved the efficiency of inverters, motors, transformers and lighting appliances • Converted to fuels emitting less CO2
Japan Cement Association	<Past efforts> (1) Promoted the dissemination of energy saving equipment (waste heat power generation, high-efficiency clinker coolers, etc.) (2) Expanded the use of waste as an alternative energy source <Efforts made in fiscal 2013> (1) Promoted the dissemination of energy saving equipment (2) Expanded the use of waste as an alternative energy source (3) Expanded on the other uses of waste
Liaison Group of Japanese Electrical and Electronics Industries for Global Warming Prevention	<Past efforts> (1) Obligated member companies wishing to participate in the industrial action plan under the Commitment to a Low Carbon Society aiming to achieve the common target set up by the industry in order to ensure achievement of the industry-wide target (2) Enhanced the support system by sharing best energy-saving practices, etc., with an aim to achieve the industry-wide target <Efforts made in fiscal 2013> (1) Improved production processes or product quality (2) Enhanced management (3) Installed high-efficiency appliances (4) Improved control methods.( rotation speed, etc.) (5) Conducted cogeneration, stored heat and stored electricity

<p>Japan Federation of Construction Contractors</p>	<p>&lt;Past efforts and efforts made in fiscal 2013&gt;</p> <ol style="list-style-type: none"> <li>(1) Reduced surplus soil volumes and shortened conveyance distance</li> <li>(2) Promoted no idling and high fuel efficiency driving methods</li> <li>(3) Encouraged the proper maintenance of heavy machinery and vehicles</li> <li>(4) Promoted the adoption of high-performance energy-saving construction methods, construction machines and vehicles</li> <li>(5) Promoted the use of high-efficiency makeshift lighting appliances, etc.</li> <li>(6) Promoted energy-saving activities at local offices, etc.</li> </ol>
<p>Japan Automobile Manufacturers' Association / Japan Auto-Body Industries Association</p>	<p>&lt;Past efforts&gt;</p> <ol style="list-style-type: none"> <li>(1) Equipment <ol style="list-style-type: none"> <li>A. Energy supply-side measures <ul style="list-style-type: none"> <li>• Introduced cogeneration equipment and improved the efficiency</li> <li>• Introduced high-efficiency compressors, reduced steam air feed pressure, etc.</li> <li>• Addressed radiant heat loss in steam pipes</li> <li>• Introduced and renewed to high-efficiency electric substation equipment</li> </ul> </li> <li>B. Measures for energy-intensive equipment <ul style="list-style-type: none"> <li>• Developed steamless or airless processes, reduced air leaks, shortened the time required for airblow, introduced inverter-controlled ventilation and cooling fans</li> <li>• Reduced the electric power required by introducing welding chip molding machines, introduced waste heat collection devices for paint drying ovens</li> <li>• Optimized the efficiency of welding ovens and drying ovens; recovered waste heat, etc.</li> <li>• Saved energy in lighting equipment</li> <li>• Improved processes, implemented electric power saving measures (took out unnecessary lighting, shortened air conditioning operation hours), visualized energy use (installed airflow meters and electric power meters), etc.</li> </ul> </li> </ol> </li> <li>(2) Measures to improve productivity <ol style="list-style-type: none"> <li>A. High-performance operation and management technologies, including energy supply methods <ul style="list-style-type: none"> <li>• Improved operations (efficiency operations, reduced energy (electric power, air) consumption when the equipment is not in operation, consolidation of air conditioning equipment and freezers, etc.)</li> <li>• Increased energy savings from the furnace body of paint booths</li> <li>• Reduced the air supply pressure of air and steam, changed the compressor control and reviewed piping</li> </ul> </li> <li>B. Consolidated production lines <ul style="list-style-type: none"> <li>• Consolidated and integrated equipment and production lines and consolidated heat processing ovens and casting lines, etc.</li> <li>• Reviewed the painting process (no paint, shorter processes, changes in air conditioning controls)</li> </ul> </li> </ol> </li> <li>(3) Fuel conversion, ESCO projects <ol style="list-style-type: none"> <li>A. Fuel conversion measures <ul style="list-style-type: none"> <li>• Heavy oil heaters and once-through-type boilers: converted from heavy oil to city gas</li> <li>• Ladle heater in aluminum casting: converted from city gas to electric power (far-infrared heater)</li> </ul> </li> <li>B. Others <ul style="list-style-type: none"> <li>• Saved energy by reducing air leakage, steam leakage, water leakage and heat loss: saved energy through technological and operational improvements</li> </ul> </li> </ol> </li> <li>(4) Offices and others <ol style="list-style-type: none"> <li>① Operation improvements <ul style="list-style-type: none"> <li>• Reduced office lighting, controlled air conditioning, implemented measures to save energy in office appliances, etc.</li> </ul> </li> <li>② Equipment improvements <ul style="list-style-type: none"> <li>• Replaced lighting in office buildings with LED light</li> </ul> </li> </ol> </li> <li>(5) Energy savings through collaboration along the supply chain, etc. <ul style="list-style-type: none"> <li>• Promoted further CO2 emission reductions by sharing information on energy-saving good practices and technologies among manufactures of the final product, cooperative auto-body parts manufactures, and other companies along the supply chain</li> </ul> </li> </ol>

	<p>&lt;Efforts made in fiscal 2013&gt;</p> <ol style="list-style-type: none"> <li>(1) Improved energy supply-side equipment</li> <li>(2) Improved energy demand-side equipment</li> <li>(3) Improved operations and management</li> <li>(4) Consolidated production lines</li> <li>(5) Fuel conversion</li> <li>(6) Offices and others</li> </ol>
Japan Auto Parts Industries Association	<p>&lt;Past efforts&gt;</p> <ol style="list-style-type: none"> <li>(1) Improved driving methods, including stopping idling</li> <li>(2) Improved the efficiency of equipment and appliances</li> <li>(3) Streamlined processes</li> <li>(4) Recovered waste energy through cogeneration, etc.</li> <li>(5) Mutually introduced energy-saving technologies and exchanged information on energy use</li> </ol> <p>&lt;Efforts made in fiscal 2013&gt;</p> <ol style="list-style-type: none"> <li>(1) Saved energy by designing a hybrid pump harnessing a combination of power sources</li> <li>(2) Addressed air leakage from airsets (automatic drains, regulators)</li> <li>(3) Saved energy by reusing exhaust from paint booths</li> <li>(4) Renewed mercury lamps to LED lighting</li> <li>(5) Addressed waste heat and radiation heat released into assembly room</li> </ol>
Japan Federation of Housing Organizations	<p>&lt;Efforts made in fiscal 2013&gt;</p> <ol style="list-style-type: none"> <li>(1) Planning and designing <ul style="list-style-type: none"> <li>• Improved housing performance, including retrofitting to meet quake-resistance standards and to save energy</li> <li>• Conserved and created natural environments by promoting the construction of housing that exists in harmony with the environment.</li> <li>• Created good quality housing by promoting and disseminating high-insulation highly airtight housing and by developing and disseminating "net zero energy houses" and "life-cycle carbon minus housing"</li> <li>• Promoted longer lives for housing</li> </ul> </li> <li>(2) Construction: adopted construction methods that accommodate both higher productivity of housing and environmental considerations <ul style="list-style-type: none"> <li>• Reduced construction on site by using precut panels and promoting industrialization, thus reducing waste</li> <li>• Enhanced process management and improved the efficiency of transporting construction material and reduced the number of deliveries</li> <li>• Promoted the reuse and recycling of construction waste; promoted the use of recycled material</li> <li>• Ensured that delivery vehicles travelling to and from plants and construction sites refrain from idling</li> <li>• Made sure to segregate the demolition debris</li> </ul> </li> <li>(3) Others <ul style="list-style-type: none"> <li>• Promoted understanding about energy-saving housing through various public relations activities</li> </ul> </li> </ol>
Japan Mining Industry Association	<p>&lt;Past efforts&gt;</p> <ol style="list-style-type: none"> <li>(1) Retrofitted, renewed or upgraded the efficiency of various equipment at each refining plant</li> </ol> <p>&lt;Efforts made in fiscal 2013&gt;</p> <ol style="list-style-type: none"> <li>(1) Copper: Increased oxygen enrichment to reduce the amount of pulverized coal used, introduced inverter-controlled blowers and fans</li> <li>(2) Zinc: Reduced steam loss; consolidated and enlarged compressors, recovered waste heat from blast furnaces; recovered heat from reaction tanks, etc.</li> <li>(3) FeNi: Operated electrical furnaces on low current and high voltage, introduced top-runner transformers; retrofitted kiln burners</li> <li>(4) Installed heat exchangers in the heavy oil-fired burners of casting pots and reduced steam in wintertime by retaining heat</li> </ol>
Lime Manufacture	<p>&lt;Past efforts and efforts made in fiscal 2013&gt;</p>

Association	<p>(1) Enhanced the use of recycled fuels  (2) Improved operation methods  (3) Streamlined processes  (4) Improved the efficiency of equipment and appliances</p>
The Japan Rubber Manufacturers Association	<p>&lt;Past efforts&gt;  (1) New or additional installation of cogeneration systems  • New or additional installation of high-efficiency cogeneration systems using city gas, etc.  • Converted cogeneration fuels from heavy oil to LNG  (2) Introduced high-efficiency appliances  • Installation of high-efficiency appliances, including fans, motors, lighting; introduction of inverter devices  (3) Implemented conventional energy-saving practices  • Applied heat retention and thermal insulation, prevented leakages and recovered heat in thermal equipment  • Improved the efficiency of operations through rotation speed control, intermittent operation and downsizing of equipment  (4) Improved the efficiency through energy conversion and revisions in the production process  • Improved processes by introducing waste oil furnaces, converted the fuels used in furnaces and boiler to gas  • Streamlined production by consolidating production processes and equipment by reviewing operations covered by different business locations  (5) Improved efficiency of air conditioning systems  • Introduced ice thermal storage, absorption-type freezer, heat pumps  (6) Improved product durability  • Achieved significant improvements in product durability by converting from bias tires to radial tires  • Developed high-durability rubber materials  (7) Technological development and promotion  • Developed high fuel efficiency tires with reduced rolling resistance based on LCA. Promoted sales and dissemination  • Developed and disseminated run flat tires  • Promoted efforts related to retread tires  (8) Introduced a tire labeling program  &lt;Efforts made in fiscal 2013&gt;  (1) Converted fuel in cogeneration and production processes  • Converted fuels used in cogeneration and in the production process (boilers, etc.) from heavy oil to LNG. Introduced steam and waste heat-powered operations  (2) Introduced high-efficiency appliances  • Introduced high-efficiency appliances and systems for air conditioning, lighting (LED), production equipment, pumps, compressors, motors, molding machines, transformers, boilers, etc. Introduced inverter devices, etc.  (3) Saved energy in production operations  • Renewed and efficiently used of equipment and machinery, converted and improved processes</p>
The Federation of Pharmaceutical Manufacturers' Associations of Japan	<p>&lt;Past efforts&gt;  (1) Converted energy  (2) Selected high-efficiency appliances, etc.  (3) Recovered Waste heat through heat exchange  (4) Reviewed operational and control methods of equipment and appliances  (5) Introduced cogeneration  (6) Installed inverter devices  &lt;Efforts made in fiscal 2013&gt;  • In addition to the above 6 items, reduced heat loss by applying thermal insulation to appliances and piping, reduced no-load loss at transformers (improved the power factor using a compressor), and introduced energy monitoring systems</p>



<p>Flat Glass Manufacturers Association of Japan</p>	<p>&lt;Past efforts&gt;  (1) Streamlined production by dismantling and consolidating flat glass manufacturing equipment (melting furnace)  (2) Improved heat recovery efficiency through regular repairs of furnaces (cold repair)  (3) Consolidated production to reduce losses per oven from changing glass types and colors  (4) Developed and introduced new high-efficiency burning technologies (continued)  (5) Improved operating conditions of equipment  &lt;Efforts made in 2013&gt;  (1) Partial use of oxygen  (2) Retained the oven heat during regular checkups  (3) Introduced inverter-controlled equipment  (4) Reduced lighting equipment and replaced existing lighting with LED, etc.</p>
<p>Japan Federation of Printing Industries</p>	<p>&lt;Past efforts&gt;  (1) Implemented energy savings in printing machines and peripheral equipment, visualized energy use, and implemented measures in auxiliary facilities  &lt;Efforts made in fiscal 2013&gt;  (1) Lighting  • Introduced high frequency lighting appliances and LED, switched from general illumination to partial illumination, and automatic light switch timers, etc.  (2) Air conditioning  • Renewed air conditioning equipment, introduced inverter-controlled conditioning equipment, etc.  (3) Engines  • Prevented and improved air leakage  • Introduced inverter-controlled motors, etc.  (4) Received and transformed electric power  • Renewed and improved transformers  (5) Others  • Installed control meters  • Conducted greening of rooftops and walls  • Introduced solar power systems  • Introduced energy-saving CPU  • Introduced energy management systems, etc.</p>
<p>Japan Aluminium Association</p>	<p>&lt;Past efforts&gt;  (1) Improved energy efficiency by energy-saving operations and processes (increased yield)  (2) Recovered energy and achieved higher energy efficiency, and promoted operations to improve productivity and yield  (3) Conducted a meeting to share energy saving good practices and promoted their industry-wide dissemination (introduced on a members-only website)  (4) Introduced energy-saving lighting  (5) Promoted the proactive recycling of aluminum (globally)  (6) Supported the adoption of aluminum to manufacture lightweight automobiles and railcars (domestically)  &lt;Efforts made in fiscal 2013&gt;  (1) Retrofitted melting furnaces and holding furnaces and improved heat recovery efficiency levels  (2) Fuel conversion  (3) Renewed existing appliances to high-efficiency energy-saving appliances.  (4) Introduced energy-saving lighting  (5) Renewed boilers  (6) Introduced inverter-controlled appliances  (7) Achieved energy savings by reviewing and optimizing operational management  (8) Enhanced measures for reduced use of compressed air</p>
<p>Brewers Association of Japan</p>	<p>(1) Power system  • Converted from heavy oil to city gas</p>

	<ul style="list-style-type: none"> <li>• Replaced existing boilers with small high-efficiency once-through boilers</li> <li>• Replaced existing freezers with high-efficiency ammonia freezers</li> <li>• Introduced cogeneration equipment</li> <li>• Introduced methane boilers</li> <li>• Installed high-efficiency inverter-controlled electric motors</li> <li>• Introduced solar power systems</li> <li>• Utilized biogas</li> <li>• Utilized waste cooking oil</li> </ul> <p>(2) Preparation phase</p> <ul style="list-style-type: none"> <li>• Introduced a vapor recompressor to the wort boiling process.</li> <li>• Introduced high-efficiency waste heat recovery</li> <li>• Recovered waste heat from boiling</li> <li>• Introduced a new boiling system</li> <li>• Introduced thermal VRC</li> <li>• Improved cleansing processes</li> </ul> <p>(3) Drainage treatment phase</p> <ul style="list-style-type: none"> <li>• Introduced anaerobic wastewater treatment equipment and biogas cogeneration systems / biogas boilers</li> <li>• Utilized waste heat from effluents</li> <li>• Reduced the power required for waste water treatment by saving water in plants</li> </ul> <p>(4) Promoted other energy-saving operations</p> <ul style="list-style-type: none"> <li>• Continued energy-saving operations</li> <li>• Reviewed sterilizing utilities</li> <li>• Proactively utilized heat pumps</li> <li>• Reviewed the unit control system (compressors, boilers)</li> <li>• Visualized energy use by establishing an energy management system (to gain an understanding of daily energy use and display target consumption levels and indices)</li> <li>• Renewed lighting equipment used in plants to energy-saving models</li> <li>• Replaced conventional mercury lamps with LEDs (enabling the reduction of existing mercury lamps by 70% in terms of electric power consumption) and replaced indoor lighting with LEDs</li> </ul> <p>&lt;Efforts made in fiscal 2013&gt;</p> <p>(1) Implemented construction work for the retrofitting of freezers</p> <p>(2) Engaged in the construction of gas engine-powered CGS</p> <p>(3) Renewed small once-through boilers</p>
The Japanese Electric Wire & Cable Makers' Association	<p>&lt;Past efforts&gt;</p> <p>(1) Efficiently used heat</p> <ul style="list-style-type: none"> <li>• Implemented measures to improve the thermal insulation of furnaces</li> <li>• Converted fuel sources; improved steam traps</li> <li>• Enhanced the heat retention performance of steam piping.</li> <li>• Improved combustion efficiency levels by installing regenerative burners.</li> </ul> <p>(2) Introduced high-efficiency equipment</p> <ul style="list-style-type: none"> <li>• Introduced elongated high-speed equipment.</li> <li>• Introduced inverter-controlled motors and pumps</li> <li>• Introduced inverter-controlled compressors and unit control</li> <li>• Introduced energy-saving stranding machines</li> </ul> <p>(3) Efficiently used electric power equipment</p> <ul style="list-style-type: none"> <li>• Established efficient electric power systems through layout changes</li> <li>• Efficiently operated electric power equipment by consolidating facilities</li> <li>• Reduced unnecessary operations by installing automatic suspension functions</li> <li>• Consolidated and renewed transformers</li> </ul> <p>(4) Others</p> <ul style="list-style-type: none"> <li>• Altered operational practices in clean rooms and air conditioning equipment</li> <li>• Suspended appliance accessories during standby; replaced existing lighting with LEDs</li> <li>• Visualized energy use</li> <li>• Applied insulating paint to rooftops and exterior walls</li> <li>• Applied thermal insulating films to windows</li> </ul>

	<ul style="list-style-type: none"> <li>• Reduced the number of vending machines and replaced existing machines with energy-saving models</li> </ul> <p>&lt;Efforts made in fiscal 2013&gt;</p> <ol style="list-style-type: none"> <li>(1) Efficiently used heat</li> <li>(2) Introduced high-efficiency equipment</li> <li>(3) Conducted efficient operations of electric power equipment</li> </ol>
Japan Dairy Industry Association	<p>&lt;Past efforts&gt;</p> <ol style="list-style-type: none"> <li>(1) Integrated and closed plants (consolidation and intensity improvements)</li> <li>(2) Introduced high-efficiency lighting (LED)</li> <li>(3) Implemented energy saving measures at the manufacturing phase (introduced high efficiency transformer, sterilizer plate, heat exchanger, etc.)</li> <li>(4) Improved the energy efficiency of air conditioning equipment</li> <li>(5) Promoted environmental management (acquired ISO14001 certification and promoted relevant activities)</li> <li>(6) Streamlined logistics (Continued efforts to improve the loading ratio through integrated shipping and to reduce the number of operating vehicles by increasing the number of rounds)</li> </ol> <p>&lt;Efforts made in fiscal 2013&gt;</p> <ol style="list-style-type: none"> <li>(1) Converted fuels</li> <li>(2) Renewed and improved cooling equipment</li> <li>(3) Introduced high efficiency lighting</li> <li>(4) Introduced cogeneration equipment</li> <li>(5) Saved energy during the manufacturing phase</li> <li>(6) Employed heat insulation and heat retention, and utilized waste heat.</li> <li>(7) Renewed and improved boilers</li> <li>(8) Improved drainage treatment equipment</li> <li>(9) Improved air conditioning equipment</li> </ol>
Japan Copper and Brass Association	<p>&lt;Past efforts&gt;</p> <ol style="list-style-type: none"> <li>(1) Consistently implemented energy-saving activities <ul style="list-style-type: none"> <li>• Company-wide environmental activities, measures to address air leakage, etc.</li> </ul> </li> <li>(2) Consistently made energy-saving investments <ul style="list-style-type: none"> <li>• Installed LED lighting, installed inverter-controlled pumps, renewed existing transformers to high-efficiency transformers, etc.</li> </ul> </li> </ol> <p>&lt;Efforts made in fiscal 2013&gt;</p> <ol style="list-style-type: none"> <li>(1) Conducted energy-saving activities in indirect sections</li> <li>(2) Introduced equipment and appliances</li> <li>(3) Managed controls and operations</li> </ol>
The Japan Society of Industrial Machinery Manufacturers	<p>&lt;Past efforts&gt;</p> <ol style="list-style-type: none"> <li>(1) Switched to inverter-controlled appliances</li> <li>(2) Conducted unit control and cluster control for efficient operations</li> <li>(3) Renewed power receiving and transforming equipment</li> <li>(4) Renewed to high-efficiency lighting</li> <li>(5) Shortened test operation hours</li> <li>(6) Regularly checked for compressed air leakage</li> <li>(7) Implemented Cool Biz and Warm Biz (8) Conducted other daily energy saving activities</li> <li>(9) Efficiently operated and renewed air conditioning equipment</li> <li>(10) Invested in equipment requiring fuel conversion</li> </ol> <p>&lt;Efforts made in fiscal 2013&gt;</p> <ol style="list-style-type: none"> <li>(1) Electrical heating <ul style="list-style-type: none"> <li>• Installed insulating blanket to thermal processing furnace, reviewed operational methods of electrical furnaces, utilized residual heat by achieving higher efficiency, installed solar panels, introduced monitoring equipment for boiler efficiency</li> </ul> </li> <li>(2) Lighting equipment <ul style="list-style-type: none"> <li>• Introduced high-efficiency lighting, replaced existing lighting equipment, installed human detection sensors, turned on selected ceiling lights, reviewed brightness standards, installed skylights on ceilings, etc.</li> </ul> </li> <li>(3) Air conditioning <ul style="list-style-type: none"> <li>• Introduced energy-saving air conditioning equipment, conducted spot air conditioning,</li> </ul> </li> </ol>

	<p>properly managed air conditioning, installed air blowers and roof fans, introduced groundwater cooling equipment, applied thermal insulation paint on rooftops, sprinkled water on the rooftops; installed thermal insulation blinds and curtains, installed windshield curtains, installed reed screens in front of air conditioner outdoor units, applied thermal insulation sheets to air conditioner outside units, etc.</p> <p>(4) Compressors</p> <ul style="list-style-type: none"> <li>• Introduced inverter-control, introduced oil-free compressors, replaced old production equipment with new equipment, downsized motors, adopted high-efficiency motors, implemented measures against air leakage, etc.</li> </ul> <p>(5) Power receiving and transforming equipment</p> <ul style="list-style-type: none"> <li>• Introduced high-efficiency transformers, introduced electric power monitoring systems, introduced demand monitoring equipment, etc.</li> </ul> <p>(6) Other equipment improvements</p> <ul style="list-style-type: none"> <li>• Conducted fuel conversion, consolidated offices on plant premises; renewed welding equipment, renewed machine tools, renewed water cooler heaters, renewed injection molding machines, renewed high lift work vehicles, renewed all-in-one copying machines, renewed PC displays, etc.</li> </ul> <p>(7) Operational improvements</p> <ul style="list-style-type: none"> <li>• Shortened product testing period, shortened and simplified processes, implemented campaigns to reduce defective products, downscaled work areas, altered production methods, applied colder processing liquids before painting, etc.</li> </ul> <p>(8) Energy-saving activities</p> <ul style="list-style-type: none"> <li>• Made sure that unnecessary lights were turned off, implemented “no electricity days” across all business locations, turned the lights off during lunch hours, left the office at fixed hours, prohibited idling on corporate premises, implemented the Cool Biz and Warm Biz campaigns, reduced vending machines, turned off refrigerators on holidays, suspended the operation of some elevators, pulled down the shutters to leave a smaller opening, etc.</li> </ul>
Japan Bearing Industrial Association	<p>&lt;Past efforts&gt;</p> <p>(1) Introduced high-efficiency inverter-controlled motors</p> <p>(2) Implemented measures against air leakage and depressurization of compressors</p> <p>(3) Converted fuels and utilized waste heat from thermal processing equipment</p> <p>(4) Introduced ice thermal storage-type air conditioning / GHP</p> <p>(5) Introduction of high-efficiency lighting appliances</p> <p>(6) Turned off the lights when not in use</p> <p>&lt;Efforts made in fiscal 2013&gt;</p> <p>(1) Power source</p> <ul style="list-style-type: none"> <li>• Utilized waste heat from cogeneration; converted fuels used in cogeneration to natural gas</li> </ul> <p>(2) Compressors</p> <ul style="list-style-type: none"> <li>• Conducted unit control, introduced inverter control, and improved air leakage</li> </ul> <p>(3) Lighting</p> <ul style="list-style-type: none"> <li>• Introduced energy-saving fluorescent lights; adopted LED lights, introduced human detection sensors</li> </ul> <p>(4) Production equipment</p> <ul style="list-style-type: none"> <li>• Introduced inverter control, conducted replacements with high-efficiency equipment</li> </ul>
Japan Sanitary Equipment Industry Association	<p>&lt;Past efforts&gt;</p> <p>(1) Implemented measures promising large CO2 emission reductions, such as converting fuels in existing kilns</p> <p>&lt;Efforts made in fiscal 2013&gt;</p> <p>(1) Implemented measures including improving the efficiency of equipment</p> <p>(2) Converted fuels used in on-site generation equipment</p> <p>(3) Converted fuels used in boilers</p> <p>(4) Converted fuels used in baking furnaces</p> <p>(5) Implemented measures to save energy, including improving the efficiency of equipment</p> <p>(6) Outsourced the procurement of raw materials and reinforced equipment</p> <p>(7) Renewed casting machines</p>

Japan Soft Drink Association	<p>&lt;Past efforts&gt;</p> <ol style="list-style-type: none"> <li>(1) Conducted fuel conversion</li> <li>(2) Reduced electric power use by introducing anaerobic treatment equipment</li> <li>(3) Reduced boiler gas by reviewing steam lines (regular inspections and exchange of steam traps, heat retention in heat-using equipment, enhanced thermal insulation of steam piping valves, etc., steam drain recovery)</li> <li>(4) Switched from heat-shrink labels that require the steam heating of PET containers to roll labels that do not require steam heating</li> <li>(5) Improved production efficiency levels (shortened the time required for switching products, optimized the time required for cleansing, improved the efficiency of sterilizers, improved PET bottle filling performance)</li> <li>(6) Introduced renewable energy, including solar power systems</li> <li>(7) Reduced electric power consumption by air conditioning equipment by applying thermal insulation paint on the rooftops of plants</li> <li>(8) Reduced energy loss by electric power saving, heat retention and cold storage</li> <li>(9) Reduced radiation (recovered waste heat)</li> <li>(10) Switched to energy-saving lighting (renewed to LED lighting and made sure to turn lights off when not in use)</li> <li>(11) Introduced heat pump air conditioning systems</li> <li>(12) Promoted energy-saving operations based on ISO14001 management programs</li> <li>(13) Conducted regular inspections for air leakage</li> <li>(14) Reduced energy use for heating and cooling use by changing the flow volume of the circulating water in heat exchangers</li> <li>(15) Reduced energy use for heating by utilizing recovered hot water from the sterilization process of canned products</li> </ol> <p>&lt;Efforts made in fiscal 2013&gt;</p> <ol style="list-style-type: none"> <li>(1) Introduced cogeneration equipment</li> <li>(2) Conducted fuel conversion / changed boilers</li> <li>(3) Replaced existing lighting with LEDs</li> <li>(4) Retrofitted sterilization equipment to save energy</li> <li>(5) Improved the ventilation of blow rooms (automated humidity control)</li> <li>(6) Renewed freezer equipment of refrigerator/freezers</li> <li>(7) Recovered waste heat and automated the main steam valve of extraction equipment</li> <li>(8) Additionally installed steam-powered compressors</li> <li>(9) Recovered waste heat from condensation equipment</li> <li>(10) Introduced inverter control</li> <li>(11) Effectively utilized the heat from steam condensate and hot waste water</li> <li>(12) Renewed freezers</li> <li>(13) Applied thermal insulation to piping and valves and prevented radiation</li> <li>(14) Renewed heat exchangers (effectively utilized waste heat)</li> <li>(15) Introduced air-cooling compressors for holidays and nighttime</li> <li>(16) Applied thermal insulation paints to pasteurizers</li> <li>(17) Improved efficiency levels in accordance with changes in manufacturing conditions</li> <li>(18) Introduced heat pump equipment</li> <li>(19) Replaced air conditioning equipment at business locations and in conference rooms</li> <li>(20) Replaced electric substation equipment</li> </ol>
Limestone Association of Japan	<p>&lt;Past efforts&gt;</p> <ol style="list-style-type: none"> <li>(1) Reduced fuel (diesel) and electric power consumption <ul style="list-style-type: none"> <li>• Proactively introduced energy-saving heavy earthmoving machinery and plant equipment</li> <li>• Conducted energy-saving operations</li> <li>• Develop the face in a way that would reduce the number of benches, thus shorting the distance climbed by heavy equipment</li> <li>• Strictly conducted inspections and improvements</li> </ul> </li> </ol> <p>&lt;Efforts made in fiscal 2013&gt;</p> <ol style="list-style-type: none"> <li>(1) Introduced feeders operating on a inverter-controlled motors</li> <li>(2) Renewed energy-saving dumping trucks</li> <li>(3) Introduced inverter-controlled dust collector fans</li> <li>(4) Renewed high-efficiency transformers</li> <li>(5) Introduced hybrid oil pressure shovels</li> </ol>

	<p>(6) Replaced mercury lighting with Ecocera (hybrid metal halide lamps)</p> <p>(7) Renewed existing lighting in quarries to LED lighting</p> <p>(8) Improved the efficiency of special high-voltage transformers</p> <p>(9) Installed belt cleaners</p> <p>(10) Remotely controlled lighting</p>
Japan Machine Tool Builders' Association	<p>&lt;Past efforts and efforts made in fiscal 2013&gt;</p> <p>(1) Issued and revised the Environmental Operation Manual; conducted activities including plant visits</p> <p>(2) Renewed air conditioning equipment installed in plants</p> <p>(3) Renewed lighting installed in plants (replaced existing lighting with LEDs)</p> <p>(4) Achieved energy savings by renewing compressors</p> <p>(5) Conducted inverter control, etc.</p> <p>(6) Adopted amorphous transformers, etc.</p>
The Shipbuilders' Association of Japan and the Cooperative Association of Japan Shipbuilders	<p>&lt;Past efforts&gt;</p> <p>(1) Consolidation and high performance operation of plants</p> <p>(2) Introduced cogeneration systems</p> <p>(3) Introduced high-efficiency motors, fans and transformers</p> <p>(4) Introduced high efficiency blast devices and rotation speed control devices</p> <p>(5) Introduced pressure optimization systems and unit control systems</p> <p>(6) Applied inverter control</p> <p>&lt;Efforts made in fiscal 2013&gt;</p> <p>(1) Renewal to high-efficiency transformers</p> <p>(2) Renewal to high-efficiency motors</p> <p>(3) Renewal to high-efficiency fans</p> <p>(4) Renewal to energy saving compressors</p> <p>(5) Introduction of energy saving lighting</p> <p>(6) Renewal of air conditioning equipment</p> <p>(7) Condensed operation and standby hours due to the introduction of high performance</p> <p>(8) Installation of solar panels</p>
The Shipbuilders' Association of Japan and the Cooperative Association of Japan Shipbuilders	<p>&lt;Past efforts&gt;</p> <p>(1) Promoted the streamlining and sophistication of production by promoting investment in automation equipment</p> <p>(2) Renewed existing equipment with energy-saving equipment</p> <p>(3) Introduced solar power systems, etc.</p> <p>&lt;Efforts made in fiscal 2013&gt;</p> <p>(1) Introduced and operated systems that would visualize energy use</p> <p>(2) Reduced the standby power use by machine tools</p> <p>(3) Adjusted the dampers of dust collectors to save energy</p> <p>(4) Implemented energy-saving measures for vacuum cleaners</p> <p>(5) Shaded the cooling towers of water cooler/heaters</p> <p>(6) Turned off the power of crane equipment during standby</p> <p>(7) Renewed local substations</p> <p>(8) Renewed air conditioning equipment</p> <p>(9) Renewed fresh water pumps to inverter pumps</p> <p>(10) Retrofitted the rooftops and walls of plant buildings to save electric power use by the use of skylights</p> <p>(11) Introduced equipment to visualize energy use</p> <p>(12) Conducted patrols for air leakage and repaired leaks</p> <p>(13) Renewed aged cables</p> <p>(14) Replaced with energy-saving spot coolers</p> <p>(15) Replaced desktop PCs with notebook PCs</p> <p>(16) Introduced high-efficiency lighting fixtures and lamps</p> <p>(17) Replaced existing drying equipment in painting plants with energy-saving drying equipment</p> <p>(18) Installed receiver tanks to prevent idling in air drainage</p> <p>(19) Replaced existing local transformers with top-runner models</p> <p>(20) Integrated transformer systems</p> <p>(21) Conducted spot air conditioning</p>

	<p>(22) Renewed aged air conditioning equipment (inverter-controlled heat pumps)</p> <p>(23) On every Monday, during the months of July through September, maintained a 70% cut in electricity use compared to the contract amount</p> <p>(24) Made sure to turn off unnecessary lighting</p> <p>(25) Managed the appropriate temperature of air conditioning and shortened operation time</p> <p>(26) Installed automatic valves in the compressed air line</p> <p>(27) Implemented company-wide holidays when operations all plants would be suspended</p> <p>(28) Reduced the number of vending-machines</p> <p>(29) Conducted compressor unit control</p> <p>(30) Took out unnecessary lights and turned off the lights when not in use</p> <p>(31) Conducted electric power-intensive tasks at night</p> <p>(32) Adjusted work processes to reduce the amount of electric power used during peak hours</p> <p>(33) Conducted the parallel use of solar water heating systems</p> <p>(34) Renewed high-pressure transformers to top-runner models</p> <p>(35) Renewed semi-automatic CO2 welding equipment and removed all manual welding equipment</p> <p>(36) Introduced LED lighting</p>
Japan Industrial Vehicles Association	<p>(1) Improved production equipment and processes</p> <p>(2) Promoted conversion to low carbon emission intensity fuels</p> <p>(3) Renewed plant facilities (lighting, air conditioning, etc.) to energy saving models</p>
Japan Association of Rolling Stock Industries	<p>&lt;Past efforts&gt;</p> <p>(1) Measures employing energy-saving equipment</p> <ul style="list-style-type: none"> <li>• Introduced energy-saving production equipment</li> <li>• Introduced solar power (smart grid pilot equipment)</li> <li>• Replaced existing lighting with LEDs</li> <li>• Replaced mercury lamps (for factory ceilings) to fluorescent lamps</li> <li>• Applied light-shielding film to windows at field offices</li> <li>• Installed air curtains and air conveyor fans</li> </ul> <p>(2) Measures employing high-efficiency equipment</p> <ul style="list-style-type: none"> <li>• Significantly changed the layout of production equipment</li> <li>• Renewed aged equipment (transformers, air conditioning equipment, lighting equipment, etc.) to high-efficiency equipment</li> <li>• Periodically renewed welding machines</li> <li>• Introduced electrostatic painting equipment to improve painting efficiency</li> <li>• Additionally introduced bogie frame fabricating equipment (gate-shaped machining centers)</li> </ul> <p>(3) Operational improvements</p> <ul style="list-style-type: none"> <li>• Formulated Environment Vision 2020, which sets up a target for 2020, decided on a mid- to long-term plan to achieve it and implemented business location-specific target management</li> <li>• Periodically cleaned the heat exchanger components of air conditioning equipment</li> <li>• Converted the fuel used in water heater boilers (kerosene=&gt;city gas)</li> <li>• Made sure to turn power sources off on non-operating days</li> <li>• Set PCs to the energy-saving mode</li> <li>• Turned off vending machines during long holidays</li> <li>• Visualized daily and hourly demand during summer and winter</li> <li>• Established weekday summer holidays</li> </ul> <p>(3) Others</p> <ul style="list-style-type: none"> <li>• Formulated the Energy Saving Action Plan (to invest 0.1% of sales in energy conservation)</li> <li>• Implemented a biannual energy-saving campaign</li> <li>• Promoted a “PC monitor off” campaign to turn PC monitors off when leaving one’s seat</li> <li>• Promoted “Energy Saving Day” and “No Work on Saturday, No Overtime working Day”</li> <li>• Participated in the “Tanabata Lights Down” campaign</li> </ul>

	<ul style="list-style-type: none"> <li>• Periodically issued Environmental News and Energy Saving News newsletters</li> <li>• Conducted energy-saving patrols</li> <li>• Promoted rooftop greening</li> </ul> <p>&lt;Efforts made in fiscal 2013&gt;</p> <ul style="list-style-type: none"> <li>• Renewed air conditioning equipment</li> <li>• Renewed lighting equipment to LEDs</li> <li>• Introduced solar power generating equipment</li> <li>• Renewed power receiving and transforming equipment</li> <li>• Renewed welding equipment</li> <li>• Used distributed compressors for plant air</li> <li>• Renewed to high-efficiency lighting</li> <li>• Cleaned heat exchanger components of air conditioning equipment</li> <li>• Renewed washroom lighting to LED and installed human detection sensors</li> <li>• Used night lights as security lights</li> <li>• Implemented thermal insulation solutions for boiler piping</li> </ul>
Japan Petroleum Development Association	<p>&lt;Past efforts&gt;</p> <ol style="list-style-type: none"> <li>(1) Consolidated and streamlines inefficiency facilities</li> <li>(2) Introduced energy-saving equipment and appliances at production plants (streamlined systems)</li> <li>(3) Improved the efficiency of operations (reduced self-consumption amounts of natural gas)</li> <li>(4) Effectively used unharnessed low-pressure gases</li> <li>(5) Conducted flaring of waste natural gas</li> <li>(6) Introduced environmental management systems</li> <li>(7) Implemented energy-saving measures at offices</li> <li>(8) Introduced natural gas vehicles</li> <li>(9) Introduced cogeneration</li> <li>(10) Introduced fuel cells at production plants</li> </ol>

## 2. Energy conversion sector

Industry	Efforts for Emission reductions made by domestic business operations
The Federation of Electric Power Companies of Japan	<p>&lt;Past efforts&gt;</p> <ol style="list-style-type: none"> <li>(1) Enhanced use of non-fossil energy sources <ul style="list-style-type: none"> <li>• Utilized nuclear power with premised on ensured safety</li> <li>• Utilized renewable energy</li> </ul> </li> <li>(2) Improved efficiency of electric power equipment <ul style="list-style-type: none"> <li>• Introduced high-efficiency thermal power plants</li> </ul> </li> <li>(3) Efforts made by electricity's suppliers as users themselves <ul style="list-style-type: none"> <li>• Engaged in efforts relating to office use and own business fleets</li> </ul> </li> </ol> <p>&lt;Efforts made in fiscal 2013&gt;</p> <ul style="list-style-type: none"> <li>• Implemented thorough safety measures fully based on lessons and new knowledge learned from the Fukushima Daiichi Nuclear Power Plant accident</li> <li>• Utilized hydropower, geothermal power, solar power, wind power and biomass</li> <li>• Developed technologies to address various outputs of renewable energy</li> <li>• Replaced highly aged thermal power plants and introduced high-efficiency equipment at the timing of implementation of new thermal power plants</li> <li>• Conducted appropriate maintenance of existing thermal power plants</li> <li>• Reduced electric power consumption from in-house office use</li> <li>• Reduced fuel use from utilizing company-owned vehicles</li> </ul>
Petroleum Association of Japan	<p>&lt;Past efforts&gt;</p> <ol style="list-style-type: none"> <li>(1) Advanced operational management supported by progress made in the development of control technologies and optimization technologies</li> <li>(2) Enhanced mutual use of heat among different equipment and increased number of equipment to recover waste heat and other waste energy</li> <li>(3) Improved Efficiency through the appropriate maintenance and management of</li> </ol>



	<p>equipment</p> <p>(4) Adopted high-efficiency equipment and catalysts</p> <p>(5) Energy-saving measures drawing on subsidized projects on energy conservation</p> <p>&lt;Efforts made in fiscal 2013&gt;</p> <p>(1) Effective use of heat</p> <ul style="list-style-type: none"> <li>• Installed heat exchangers, mutually used heat, recovered waste heat, etc.</li> </ul> <p>(2) Introduced high-performance control and high-efficiency appliances</p> <ul style="list-style-type: none"> <li>• Installed heat pumps, cogeneration systems, high-efficiency power generating equipment, etc. and promoted computer control</li> </ul> <p>(3) Engine efficiency improvements</p> <ul style="list-style-type: none"> <li>• Motorized engines, etc.</li> </ul> <p>(4) Significant improvements and advancements in processes</p> <ul style="list-style-type: none"> <li>• Promoted hydrogen recovery, integrated different units, consolidated boilers, fundamentally reduced the amount of steam use</li> </ul>
The Japan Gas Association	<p>&lt;Past efforts&gt;</p> <p>(1) Promoted various energy-saving measures at city gas manufacturing plants</p> <ul style="list-style-type: none"> <li>• Introduced cogeneration</li> <li>• Utilized cold energy from LNG, etc. <ul style="list-style-type: none"> <li>– Reduced the amount of electric power purchased at manufacturing plants by using cold energy from LNG, etc. to generate power</li> <li>– Reduced the amount of electric power used in compressors by reliquefying BOG</li> <li>– Utilized cold energy in freezers, etc.</li> </ul> </li> <li>• Installed high-efficiency equipment <ul style="list-style-type: none"> <li>– Introduced high-efficiency LNG carburetors and salt water pumps</li> <li>– Reduced electric power loss by renewing extra-high efficiency power receiving and distributing equipment</li> <li>– Reduced electric power consumption by controlling the rotation speed of LNG cold insulation circulation pumps</li> </ul> </li> <li>• Optimized operations in accordance with demand <ul style="list-style-type: none"> <li>– Increased power generation by ensuring maximum load (operational change to high-pressure lines) in top gas pressure recovery power generation plants</li> <li>– Utilized BOG as fuel for on-site power generation equipment</li> <li>– Reduced electric power consumption by reducing BOG compressor discharge pressure <ul style="list-style-type: none"> <li>– Reduced the consumption of boiler fuel by effectively utilizing the steam generated at on-site power generation plants.</li> <li>– Reviewed methods for conducting test operations of return gas blowers while waiting for the arrival of ship</li> </ul> </li> </ul> </li> </ul> <p>&lt;Efforts made in fiscal 2013&gt;</p> <p>(1) LNG cold power generation</p> <p>(2) Power generation using a gas pressure recovery power plant</p> <p>(3) Reviewed BOG compressor operations when receiving LNG vessels</p> <p>(4) Renewed air conditioning equipment on the premises</p> <p>(5) Additionally built condensers with improved power factors</p> <p>(6) Reviewed methods to prevent the corrosion of berth steel pipes</p> <p>(7) Adopted high-efficiency transformers</p> <p>(8) Altered the steam accumulator discharge pressure</p> <p>(9) Replaced BOG compressor valves with high-efficiency models</p> <p>(10) Streamlined operations of devices to additionally start LNG pumps</p>

### 3. Commercial and other sectors

Industry	Efforts for Emission reductions made by domestic business operations
Japan Association of Refrigerated Warehouses	<p>&lt;Past efforts&gt;</p> <p>(1) Replaced and introduced energy-saving equipment and technologies</p> <ul style="list-style-type: none"> <li>• Introduced high-efficiency transformers</li> </ul>

	<ul style="list-style-type: none"> <li>• Introduced high-efficiency compressors</li> <li>• Introduced devices to block outside air</li> <li>• Introduced energy-saving lighting equipment</li> <li>• Introduced closed decks</li> <li>• Increased the use of thermal insulating material</li> </ul> <p>(2) Prevented wasteful use through daily maintenance</p> <ul style="list-style-type: none"> <li>• Maintained appropriate temperatures for stored products</li> <li>• Encouraged the cleansing of condensers</li> <li>• Prevented cool air leakage from insulated doors</li> </ul> <p>(3) Utilized energy-saving manuals; formulated management standards and managed energy consumption</p> <p>&lt;Efforts made in fiscal 2013&gt;</p> <p>(1) Renewed lighting with LED</p> <p>(2) Adopted high-efficiency freezers</p> <p>(3) Replaced shipping vehicles: EV→ PL</p>
Japan Franchise Association	<p>&lt;Past efforts and effort made in fiscal 2013&gt;</p> <p>(1) Lighting</p> <ul style="list-style-type: none"> <li>• Ensured that lights were turned off during lunch hour</li> <li>• Ensured that PCs were turned off when leaving the office</li> <li>• Took out unnecessary lighting</li> </ul> <p>(2) Air conditioning</p> <ul style="list-style-type: none"> <li>• Preset cooling temperature at 28 degrees and the heating temperature at 20 degrees</li> <li>• Suspended outside air intake when starting cooling and heating operations</li> <li>• Reduced the amount of air taken in from outside by air conditioning equipment</li> </ul> <p>(3) Buildings</p> <ul style="list-style-type: none"> <li>• Suspended vending machine operations at night</li> </ul>
Japan LP Gas Association	<p>&lt;Past efforts&gt;</p> <p>(1) Established an Environmental Committee to manage performance, consider energy saving measures and exchange information</p> <p>(2) Promoted the consolidation of terminals</p> <p>&lt;Efforts made in fiscal 2013&gt;</p> <p>(1) Introduced solar power generation</p> <p>(2) Renewed air compressors</p> <p>(3) Reviewed designation requirements for pumps for normal temperature transport</p> <p>(4) Renewed existing transformers for the power supply with high-efficiency equipment</p>
The Real Estate Companies Association of Japan	<p>&lt;Past efforts&gt;</p> <p>(1) Environmental performance of newly built office buildings</p> <ul style="list-style-type: none"> <li>• Reduced heat load in buildings (enhanced thermal insulation, installed high thermal insulation glass and sashes, installed louvers and canopies, introduced double-skin facades, used blinds to control sunlight, etc.)</li> <li>• Proactively utilized natural energy (daylighting, natural ventilation, solar power and heat, rainwater, etc.)</li> <li>• Proactively engaged in greening (greening premises, rooftops, walls, etc.)</li> <li>• Introduced cogeneration systems</li> <li>• Introduced high-efficiency heat sources and transmission equipment (free cooling controller, unit control of pumps, variable flow volume control, heat recovery heat pumps, thermal storage systems, ventilation and water supply system driven by temperature difference, renewal of all heat exchanger units)</li> <li>• Introduced high-efficiency ACHV systems (fan variable air volume systems, outdoor cooling systems, detailed HVAC zoning systems, automatic CO2-based outdoor air control systems, radiation air conditioning systems, desiccant air conditioning systems, etc.)</li> <li>• Introduced high-efficiency lighting equipment (LED, high-frequency fluorescent lighting, light dimmer control systems, lighting control, task-ambient lighting, human detection sensors, increased number of brightness levels)</li> <li>• Introduced high-efficiency power receiving and transforming equipment and systems (renewal of equipment, demand-based control system, automatic power factor</li> </ul>

	<p>controller)</p> <ul style="list-style-type: none"><li>• Introduced high-efficiency elevators and escalators (inverter-controlled elevators, group control systems, human detection sensor-controlled escalators)</li><li>• Introduced high-efficiency water heaters, water supply methods, water-saving appliances, water-saving automatic faucets, automatic cleaning equipment)</li><li>• Introduced high-efficiency energy management and control systems (BEMS)</li><li>• Promoted long-life design (building design with consideration for future energy-saving retrofits, openness to alterations and improvements, measures against the degradation of building frames)</li><li>• Selected construction material accommodating considerations of the reduction of HFCs and air conditioning systems, etc.</li></ul> <p>(2) Environmental performance of newly built condominiums</p> <ul style="list-style-type: none"><li>• Installed high thermal insulation facades and double-pane windows<ul style="list-style-type: none"><li>– Achieved energy-saving standards by enhancing the thermal insulation performance of condominium facades and window panes, thus reducing the amount of energy consumed by heating and cooling</li></ul></li><li>• Introduced high-efficiency water heaters<ul style="list-style-type: none"><li>– Reduced the amount of energy consumed by water heating by introducing high-efficiency water heaters, including latent heat recovery type instantaneous gas water heaters and electric heat pump water heaters</li></ul></li><li>• Introduced hot water-saving and water-saving equipment<ul style="list-style-type: none"><li>– Reduced the amount of primary energy consumed by water heating by introducing water-saving equipment, including water-saving shower heads</li><li>– Reduced energy consumption at water supply and sewage facilities by installing water-saving toilets and faucets and utilizing rainwater and well water</li></ul></li><li>• Introduced high-efficiency lighting<ul style="list-style-type: none"><li>– Reduced the amount of energy consumed by lighting by introducing energy-efficiency lighting, including LED lighting and high-frequency fluorescent lighting, in private and communal areas (corridors, etc.)</li></ul></li><li>• Considered the utilization of renewable energy<ul style="list-style-type: none"><li>– Considered the utilization of solar panels, solar thermal systems, and other renewable energy in development districts</li></ul></li><li>• Improved living environments by introducing passive methods<ul style="list-style-type: none"><li>– Engaged in efforts to enhance energy savings and energy self-dependency levels by introducing passive methods, including taking in sunlight and wind from outdoors</li></ul></li><li>• Extended the lifetime of products<ul style="list-style-type: none"><li>– Used building frames, material, equipment and appliances, etc. and applied water supply and drain piping layouts that can accommodate future retrofits</li></ul></li><li>• Addressed next-generation vehicles<ul style="list-style-type: none"><li>– Considered the establishment of electric power charging stations and other equipment to accommodate next-generation vehicles, including electric vehicles and plug-in hybrid automobiles</li></ul></li></ul> <p>(3) Energy consumption in buildings used for business operations</p> <ul style="list-style-type: none"><li>• Altered work fashion by introducing Cool Biz and Warm Biz</li><li>• Introduced energy-saving appliances<ul style="list-style-type: none"><li>– Introduced desk lamps and energy-saving PC models, etc.</li></ul></li><li>• Implemented energy-saving measures in daily business operations<ul style="list-style-type: none"><li>– Promoted daily energy-saving actions (presetting appropriate room temperatures and brightness, promoting water conservation, turning off the lights and controlling air conditioning when not in room</li><li>– Considered improvements based on energy consumption measurements</li><li>– Implemented in-house environmental education activities</li><li>– Supported employees' energy-saving activities</li><li>– Provided employees with information (knowhow and information on energy-saving activities), etc.</li></ul></li></ul> <p>&lt;Efforts made in fiscal 2013 (major efforts)&gt;</p> <p>(1) Renewed cogeneration systems</p>
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	<p>(2) Renewed all heat exchangers  (3) Introduced inverter control  (4) Introduced the heat source unit control  (5) Introduced variable air volume control  (6) Introduced LED lighting  (7) Controlled the ventilation in washrooms using a human detection sensor  (8) Introduced thermal insulating film for window glass</p>
The Life Insurance Association of Japan	<p>&lt;Efforts made in fiscal 2013&gt;  (1) Saved electric power by adopted Cool Biz and Warm Biz dress codes, ensured lights are turned off, introduced energy-saving appliances and equipment, shortened cooling and heating hours, operated limited number of elevators during the daytime in summer, encouraged employees to leave the office early to go home, etc.  (2) Reduced paper use  (3) Promoted environmental conservation activities by formulating environmental policies and green procurement standards  (4) Reduced electric power consumption by conducting power saving campaigns and introducing energy saving appliances, etc.  (5) Partially switched from central air conditioning systems to packaged air conditioners  (6) Renewed packaged air cooled heat pumps  (7) Renewed existing lighting to high-efficiency lighting  (8) Retrofitted and renewed air conditioning equipment  (9) Renewed central monitoring devices  (10) Adopted LED lighting in communal areas of main office buildings  (11) Introduced LED lighting to some facilities  (12) Introduced high-efficiency air conditioning equipment  (13) Renewed air conditioning equipment to state-of-the-art models  (14) Introduced energy-saving PC models  (15) Introduced high-efficiency transformers  (16) Renewed aircraft warning lights (LEDs)  (17) Renewed compact cars</p>
The General Insurance Association of Japan	<p>&lt;Past efforts&gt;  (1) Developed products and services that support efforts toward a low carbon society  (2) Reduced the amount of paper used by adopted online insurance clauses and policies  (3) Promoted the introduction of high-efficiency lighting and advanced equipment  (4) Reduced energy use, including electric power use, by working shorter hours  (5) Collaborated with stakeholders, including affiliates, nonlife insurance agents, encouraged environment-friendly actions and reduced environmental burden  (6) Conducted in-house education for a better understanding of the status of global environmental issues  &lt;Efforts made in fiscal 2013&gt;  (1) Air conditioning  • Renewed air conditioning equipment  • Replaced existing air conditioning equipment with high-efficiency air conditioning equipment  (2) Lighting  • Renewed lighting appliances  • Replaced existing lighting equipment with high-efficiency lighting equipment  (3) Others  • Renewed elevators  • Renewed cold and hot water equipment</p>
Telecommunications Carriers Association	<p>&lt;Past efforts&gt;  (1) Introduced energy saving equipment and technologies  • Introduced high energy-saving performance ICT devices in line with the guidelines formulated by the Council for Ecology Guidelines for ICT  • Promoted energy savings by connecting IP devices, such as servers and routers, to direct current power supply systems  • Introduced high energy efficiency power units and promoted energy saving measures (suspended telecommunication power units operating for prolonged periods and inverters with no load connection)  • Introduced high-efficiency air conditioning equipment, removed air conditioning from wireless base stations; promoted energy saving measures for air conditioning</p>

	<p>equipment (heat retention in steam piping, cold water pump exchange, air conditioning fan motor exchange, etc.)</p> <p>(2) Introduction of natural energy</p> <ul style="list-style-type: none"> <li>• Introduced clean energy systems, including solar and wind power systems</li> <li>• Newly introduced fuel cell equipment in various locations</li> </ul> <p>(3) Research and development in energy saving and clean energy fields</p> <ul style="list-style-type: none"> <li>• Developed technologies to save the energy consumed by telecommunication equipment, including telecommunication devices and air conditioning equipment</li> <li>• Reduced electric power use by achieving higher network efficiency by sharing optical cables and multiplexing</li> <li>• Reduced ICT resources on local servers by using cloud technologies and virtualization technologies</li> </ul> <p>(4) Measures to reduce electric power use in offices</p> <ul style="list-style-type: none"> <li>• Promoted environmental activities by expanding and renewing ISO14001 certification acquisition (energy saving activities at business locations and offices)</li> <li>• Promoted energy management in company-owned buildings</li> <li>• Promoted the visualization of the amount of electric power used in offices</li> <li>• Reduced electric power consumption related to air conditioning by implementing the Cool Biz and Warm Biz campaigns</li> <li>• Applied insulation films to window glasses</li> <li>• Introduced energy-saving fluorescent lamps and LED lighting; reduced the amount of electric power used for illumination by controlling the hours of use</li> </ul> <p>(5) Measures to reduce emissions from logistics</p> <ul style="list-style-type: none"> <li>• Practiced “eco-drive” on corporate vehicles and promoted the introduction of low-pollution vehicles</li> <li>• Promoted a modal shift through the unified management of logistics</li> </ul> <p>&lt;Efforts made in fiscal 2013&gt;</p> <p>(1) Comprehensive electric power consumption reduction campaign (member company A)</p> <ul style="list-style-type: none"> <li>• Introduced high energy-saving performance ICT devices in line with the guidelines formulated by the Council for Ecology Guidelines for ICT</li> <li>• Promoted energy management in buildings owned by the corporate group</li> <li>• Introduced high energy efficiency electric power equipment and air conditioning equipment</li> <li>• Promoted energy savings by connecting IP devices, such as servers and routers, to direct current power supply systems</li> <li>• Established and operated “green data centers” using state-of-the-art energy saving technologies</li> <li>• Offered electric power consulting services to identify points requiring operational improvements based on data analysis</li> <li>• Introduced clean energy systems, including solar and wind power systems</li> </ul> <p>(2) Good practices in implementing energy saving measures (member company B)</p> <ul style="list-style-type: none"> <li>• Energy saving measures for fixed-line telecommunication operators <ul style="list-style-type: none"> <li>– Slimmed down fixed-line telecommunications networks</li> <li>– Conducted energy saving construction work (introduced automatic heat source control, introduced cooling with outside air, etc.)</li> <li>– Implemented energy-saving measures in telecommunications shelters and data centers (altered refrigerator cooling water temperatures, suspended telecommunication power units operating for prolonged periods and inverters with no load connection, etc.)</li> </ul> </li> <li>• Measures targeted at mobile communications operators <ul style="list-style-type: none"> <li>– Removed air conditioning from wireless base stations</li> <li>– Extended the life of base station batteries to 24 hours</li> </ul> </li> <li>• Initiated solar power businesses</li> </ul>
Japan Foreign Trade Council, Inc.	<p>&lt;Past efforts&gt;</p> <p>(1) Introduction of energy-saving equipment, etc.</p> <ul style="list-style-type: none"> <li>• Introduced energy-saving OA appliances</li> </ul>

	<ul style="list-style-type: none"><li>• Introduced LED lighting</li><li>• Introduced energy-saving air conditioning equipment</li><li>• Introduced human detector sensors in hallways and washrooms</li><li>• Introduced energy-saving vending machines</li><li>• Introduced inverter-controlled lighting equipment</li><li>• Introduced individual air conditioning systems</li><li>• Introduced thermal insulation films for windows</li><li>• Introduced district heating and cooling systems</li><li>• Introduced high-efficiency pumps</li><li>• Converted the heat source of air conditioning equipment (from electric power to city gas)</li><li>• Introduced high efficiency water heaters</li><li>• Introduced solar power systems</li><li>• Introduced inverters for main cold water pumps</li><li>• Renewed elevators</li><li>• Renewed fan coils</li><li>• Renewed boiler equipment</li></ul> <p>(2) Ensured energy management</p> <ul style="list-style-type: none"><li>• Turned off the lights during lunch hour</li><li>• Took out unnecessary lighting</li><li>• Managed air conditioning temperatures and hours</li><li>• Activated the power-save mode on PCs and copying machines</li><li>• Controlled the hours for turning lights off in the evening or at night</li><li>• Had security guards check that lights were turned off during routine patrols</li><li>• Implemented “No Overtime working Days”</li><li>• Individually managed energy consumption at different sites</li><li>• Dimmed lighting equipment</li><li>• Controlled the operating hours of water heaters, tea servers and vending machines</li><li>• Reduced the number of elevators in use</li><li>• Controlled the amount of air taken in from outside</li><li>• Suspended outside air intake when starting cooling and heating operations</li><li>• Improved elevator operations</li><li>• Limited the number of copying machines and printers used</li><li>• Provided flextime options</li><li>• Improved the efficiency of boiler use</li></ul> <p>(3) Promotion of educational activities</p> <ul style="list-style-type: none"><li>• Encouraged that lights be turned off when not in use</li><li>• Encouraged that the power-save mode be activated on PCs</li><li>• Encouraged that office appliances be turned off or plugged out when not in use</li><li>• Promoted the reduction of working on holidays and overtime</li><li>• Encouraged the operation of window blinds</li><li>• Made announcement via the Intranet, group newsletters, poster, email, etc.</li><li>• Encourage the use of stairs (limited use of elevators)</li><li>• Conducted environmental campaigns</li><li>• Hosted environmental seminars</li><li>• Conducted environmental e-learning</li></ul> <p>&lt;Efforts made in fiscal 2013&gt;</p> <p>(1) Introduction of energy-saving equipment</p> <ul style="list-style-type: none"><li>• Renewed air conditioning equipment (temperature controllers, humidifiers, heat exchangers)</li><li>• Renewed absorption chiller heaters for air conditioners</li><li>• Replaced existing lighting with LEDs</li><li>• Replaced existing fan motors with high-efficiency models</li><li>• Introduced high-efficiency pumps (renewed pumps for air conditioning equipment and sanitary equipment)</li><li>• Renewed kitchen appliances</li></ul>
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	<ul style="list-style-type: none"> <li>• Improved indoors cooling systems (utilized outdoor air for cooling the electric power room during wintertime)</li> <li>• Installed automatic toilet sound blockers in women’s washrooms</li> <li>• Commissioned renewable energy power generation</li> <li>• Replaced existing light bulbs with LED bulbs, introduced LED bulbs</li> <li>• Converted to energy-saving PC models</li> <li>• Renewed elevators and introduced inverter-controlled elevators</li> <li>• Renewed fan coils for air conditioning equipment</li> </ul> <p>(2) Ensured energy management</p> <ul style="list-style-type: none"> <li>• Started implementing BEMS</li> <li>• Used energy consumption management and calculation tools at all business locations and conducted the timely management of progress made in reducing energy consumption</li> <li>• Improved heat source operation methods (reduced 100 thousand kWh (estimate))</li> <li>• Shortened the general operating time of air conditioning equipment (crude oil equivalent of 18kl)</li> <li>• Thoroughly managed the preset temperature of air conditioners</li> <li>• Activated the power-save mode on PCs</li> <li>• Took out unnecessary fluorescent light bulbs and dimmed lights</li> <li>• Took out unnecessary lighting equipment</li> </ul> <p>(3) Promotion of educational activities</p> <ul style="list-style-type: none"> <li>• Conducted environmental education for employees as a part of environmental management systems</li> <li>• Implemented energy-saving practices in the office as a part of the ISO14001 environmental management system</li> <li>• Encourage the consideration, implementation and management of energy streamlining measures</li> <li>• Prohibited employees from working during midnight hours; tested early morning commuting (annual reductions of 209t-CO2)</li> <li>• Made sure to turn off the lights, air conditioning and PCs during lunch hour, when not in use and before leaving the office to go home</li> <li>• Continued to implement the Cool Biz campaign and took company-wide summer vacations</li> <li>• Promoted the Cool Biz and Warm Biz campaigns and all-year energy-saving activities (presetting air conditioning equipment at optimal temperatures (including remote control programs); invited employees to block sunlight by lowering window blinds, to turn off unnecessary lights and save water)</li> <li>• Ensured the implementation of “No Overtime working Days”</li> <li>• Posted “Switch off after use” on electrical appliances</li> </ul>
Japanese Bankers Association	<p>&lt;Past efforts&gt;</p> <p>(1) Efficient use of resources</p> <ul style="list-style-type: none"> <li>• Promoted paperless offices</li> <li>• Reduced electric power consumption by promoting energy-savings</li> </ul> <p>(2) Establishment of a recycling-based society</p> <ul style="list-style-type: none"> <li>• Promoted the use of recycled paper for envelopes used for in-house correspondences, memo pads, business cards, copy paper</li> <li>• Conducted the segregated collection of used paper</li> </ul> <p>(3) Education and awareness-raising</p> <ul style="list-style-type: none"> <li>• Promoted in-house education programs</li> <li>• Conducted lectures on environmental issues for member banks</li> </ul> <p>(4) Social action programs</p> <p>(5) Development of new services to meet increased environmental consciousness among customers</p> <p>(6) Provision of environmental information to customers</p> <p>&lt;Efforts made in fiscal 2013&gt;</p> <p>(1) Renewal of lighting and air conditioning equipment</p> <p>(2) Renewal of air conditioning equipment</p>

	<p>(3) Renewal of freezers</p> <p>(4) Renovation to retrofit new or additional insulation</p> <p>(5) Renewal of lighting equipment</p> <p>(6) Introduction of solar power systems</p> <p>(7) Introduction of BEMS</p> <p>(8) Introduction of natural ventilation systems</p>
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#### 4. Transportation Sector

Industry	Efforts for Emission reductions made by domestic business operations
The Scheduled Airlines Association of Japan	<p>&lt;Past efforts&gt;</p> <p>(1) Renewed existing aircrafts to new models with higher fuel efficiency and promoted the introduction of new models</p> <p>(2) Improved aircraft performance by renovating and improved fuel efficiency levels</p> <p>(3) Introduced new air traffic control system in order to shorten flight paths and duration and improve navigation performance</p> <p>(4) Introduced Continuous Descent Operations (CDO) for higher fuel efficiency</p> <p>(5) Improved fuel efficiency by managing daily flights at optimum cruise altitudes and the best range speed, using simulators to reduce the time required for real aircraft training and evaluations, reducing the time required for engine tests, improving fuel efficiency through regular engine water washes</p> <p>&lt;Efforts in fiscal 2013&gt;</p> <p>(1) Continued renewal to high efficiency equipment</p>
The Japanese Shipowners' Association	<p>&lt;Efforts made in fiscal 2013&gt;</p> <p>(1) Pursued optimal economic navigation in containerships</p> <p>(2) Jointly developed CO2 emission reduction equipment for sailing vessels with shipbuilding companies</p> <p>(3) Introduced LNG-powered tugboats with a Dual Fuel (LNG and heavy oil) engine</p> <p>(4) Decided on building a next-generation environment-friendly flagship (major vehicle carrier vessel)</p> <p>(5) Operated large bulkers with high-efficiency waste heat energy recovery systems</p> <p>(6) Built vessels with air lubrication systems</p> <p>(7) Installed hybrid electric power supply systems</p> <p>(8) Installed exhaust gas dust collectors</p> <p>(9) Conducted a long-term experiment to test variable turbine nozzle-type superchargers on real vessels</p> <p>(10) Periodically cleaned and painted ship bodies and polished propellers for improved propulsive efficiency</p> <p>(11) Improved fuel valves and exhaust valves in order to improve the fuel efficiency of the main engine</p> <p>(12) Used combustion improve</p> <p>(13) Extended the hours of use and reduced consumption amounts by properly managing lubricating oil</p> <p>(14) Thoroughly conducted the maintenance of main engines and auxiliary machines as well as the cleansing and maintenance of exhaust gas economizers</p> <p>(15) Monitored combustion status using an engine performance analysis system</p> <p>(16) Selected optimal nozzle rings for superchargers</p> <p>(17) Implemented energy-saving measures, including turning off unnecessary pumps of vessels in harbor, galley fans during non-cooking hours, and the lights in unoccupied rooms</p> <p>(18) Optimized the amount of fuel oil and ballast water retained on board a vessel</p>
Japan Federation of Coastal Shipping Associations	<p>&lt;Past efforts&gt;</p> <p>(1) Equipment-related measures</p> <ul style="list-style-type: none"> <li>• Adopted larger ships</li> <li>• Introduced new models</li> <li>• Adopted energy-saving ship configurations, devices and equipment</li> </ul> <p>(2) Operational measures</p> <ul style="list-style-type: none"> <li>• Improved transport efficiency</li> <li>• Conducted an energy-saving diagnosis for each individual ship</li> </ul>



	<ul style="list-style-type: none"> <li>• Selected transport routes</li> </ul> <p>&lt;Efforts made in fiscal 2013&gt;</p> <p>(1) Introduced low CO2-emission vessels that will reduce CO2 emissions by more than 10%</p>
All Japan Freight Forwarders Association	<p>&lt;Past efforts&gt;</p> <p>(1) Enhanced and expanded off-rail stations (ORS), beginning with the establishment of Hanyu ORS</p> <p>(2) Supported the introduction of low-pollution vehicles (vehicles in compliance with emission standards, CNG vehicles)</p> <p>(3) Promoted replacement with larger vehicles</p> <p>&lt;Efforts made in fiscal 2013&gt;</p> <p>(1) Introduced 31ft containerships, etc.</p>
The Association of Japanese Private Railways	<p>&lt;Past efforts&gt;</p> <p>(1) Promoted the introduction of energy-saving railcars upon renewal or reinforcement</p> <p>(2) Adopted driving methods that require less electric power consumption and appropriately operated train services in accordance with transportation demand</p> <p>(3) Eliminated unnecessary lighting on trains and replaced existing lighting equipment with LEDs</p> <p>&lt;Efforts made in fiscal 2013&gt;</p> <p>(1) Continued to promote the introduction of energy-saving railcars</p>

## Examples of efforts to cooperate with interested groups

## 1. Industrial sector

Industry	Examples of efforts to cooperate among interested parties
The Japan Iron and Steel Federation	<p>(1)LCA-based efforts</p> <ul style="list-style-type: none"> <li>Iron and steel manufacturers have proactively promoted the development of high performance products characterize by their light weight, high efficiency, long life, etc These products contribute to energy savings at the use phase in society, for example, when they are used in automobiles. Renewed the “Study on contribution of steel products to energy savings in society from LCA viewpoint” which is a compilation of CO2 emission reductions at the use phase of iron material and estimated the emission reductions achieved as of fiscal 2013. The CO2 emission reductions achieved by high-performance iron material as of fiscal 2013 (fiscal 1990-2013; total of domestic and overseas reductions).were estimated to be 25.58 million t-CO2 .</li> </ul>
Japan Chemical Industry Association	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>Promoted the development and dissemination of chemical products and technologies and contributed to society-wide CO2 emission reductions through the supply chain.</li> <li>Based on the Guideline for Calculating the Avoided CO2 Emission formulated with the cooperation of the World Business Council for Sustainable Development (WBCSD) and The International Council of Chemical Associations (ICCA), issued the first international guidelines for calculating the avoided GHG emissions possible by chemical products.</li> <li>In order to meet the abovementioned guidelines, revised the Japan Chemical Industry Association Report (Third version) by renewing and adding best practices.</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>Contributed to domestic CO2 emission reduction through a total of 71 low-carbon products, including 26 automobile-related products, 14 housing-related material, 7 renewable energy-related material, 24 other material.</li> </ul>
Japan Paper Association	<p>(1) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>Promoted CO2 emission reductions by engaging in efforts to develop lightweight and thin cardboard from an entire lifecycle perspective beginning from the manufacturing phase at factories through to the recovery and recycling phase. Reduced the average weight of a unit area of paper by approximately 7.1% by disseminating lightweight base paper with the same performance and intensity but weighing 25% of conventional paper.</li> </ul> <p>(2) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>Use environmental household accounts to check the status of electricity, gas and water use in each household to raise public awareness regarding energy-saving.</li> </ul>
Japan Cement Association	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>Conducted outreach activities, including pavement testing and seminars, targeted at the government to “reduce emission by improving the fuel efficiency of heavyweight vehicles on concrete pavement.”</li> <li>Accepted waste and byproducts generated in other industries for utilization in cement production to “contribute to the establishment of a Sound Material-Cycle Society”.</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>Collaborated with related industries (cement users) to promote measures to address the heat island phenomenon, build high-insulation housing, extend the life time of buildings, reduce the energy used in construction, etc.</li> </ul> <p>(3) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>Supported local environmental education and implemented environmental outreach activities in areas around business locations.</li> </ul>
Liaison Group of Japanese Electrical and Electronics Industries for Global Warming Prevention;	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>Contributed to CO2 emission reductions in various areas, including power generation, household appliances. ICT products and solutions.</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>Contributed to the prevention of global warming and the achievement of a low-carbon society from both energy supply and demand perspectives by providing low-carbon</li> </ul>

	<p>energy-saving products and services to domestic energy conversion and residential and commercial sectors.</p> <ul style="list-style-type: none"> <li>• Formulated a method to calculate avoided CO2 emissions from major products and services. Based on this method, calculated and disclosed the total avoided CO2 emissions across the industry.</li> <li>• Estimated the avoided emissions attributable to semiconductors and electronic parts, as examples of products included in the calculations.</li> </ul> <p>(3) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Formulated the annual “Unified Agenda for All Electrical and Electronics Organizations” and engaged in efforts to save electric power in offices and the homes of employees.</li> </ul> <p>(4) Future efforts</p> <ul style="list-style-type: none"> <li>• Estimate potential avoided emissions attributable to low-carbon energy-saving products and services in 2020 and 2030 relative to 2005 levels premised on macroeconomic indices and other factors.</li> </ul>
Japan Federation of Construction Contractors	<p>(1) Performance in 2013</p> <ul style="list-style-type: none"> <li>• Implemented surveys on “figures used in the Energy Saving Plan,” “the status of progress with the Comprehensive Assessment System for Built Environment Efficiency (CASBEE)” and “the figures used in the CASBEE assessment”.</li> <li>• Compiled and disclosed progress in the “Environment-friendly Designs of the Japan Federation of Construction Contractors Member Companies (Buildings)” report.</li> <li>• Collaborated with the contractees, The Real Estate Companies Association of Japan and the Japan Building Owners and Managers Association, under the Environmental Measures Research Group to conduct various activities.</li> <li>• Submitted opinions regarding MLIT’s ministerial ordinances and conducted relevant seminars</li> <li>• Participated in the Low Carbon Promotion Conference with a membership of 18 construction-related organization</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Revised the “Guidelines for Sustainable Building Design” based on values, including energy efficiency, energy self-dependency and BCP, enhanced after the Great East Japan Earthquake</li> </ul> <p>(3) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Participated in Eco Products 2013 (December 2013 in Tokyo)</li> </ul> <p>(4) Future efforts</p> <ul style="list-style-type: none"> <li>• Engaged in activities to reduce CO2 emissions during the building operation phase</li> <li>• Participate in Eco Products 2014</li> </ul>
Japan Automobile Manufacturers Association, Inc.  Japan Auto-Body Industries Association, Inc.	<p>(1) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Contributed to the reduction of CO2 emissions in the transportation sector under inter-industrial collaboration to develop and introduce innovative technologies in raw material, parts, equipment and manufacturing methods and to promote the decarbonization of products and services, thus improving the fuel efficiency of new vehicles and disseminating next-generation vehicles.</li> </ul> <p>(2) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Engaged in educational activities, including Cool Biz, eco-commuting, no idling, environmental management training, and promoted the use of environmental household account books.</li> </ul>
Japan Auto Parts Industries Association	<p>(1) Performance in 2013</p> <ul style="list-style-type: none"> <li>• Implemented the 7<sup>th</sup> Voluntary Action Plan on the Environment and compiled best practices of member companies</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Contribute to reducing environmental burden by providing auto-body manufacturers with fuel efficient parts.</li> <li>• Shared the energy-saving technologies accumulated by member companies and management knowhow to promote net CO2 emission reductions from the product lifecycle.</li> </ul> <p>(3) Future efforts</p> <ul style="list-style-type: none"> <li>• Revise the compilation of best practices, host seminars on saving energy, conduct field trips for member companies to visit high-efficiency factories.</li> </ul>
Japan Federation of Housing Organizations	<p>1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• It is important to reduce CO2 emissions from the entire product lifecycle in terms of</li> </ul>

	<p>housing. In particular, promoted the dissemination of highly insulated airtight housing, and the adoption of power generation equipment, including solar power systems, and high-efficiency appliances to contribute to the reduction of CO2 emissions during the use phase when emissions are largest.</p> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Developed and disseminated “net zero energy houses” and “lifecycle carbon minus housing”</li> </ul> <p>(3) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Compiled and distributed environmental education booklets “Let’s live in an energy-efficient home” “Reasons why you should live in an energy-efficient home”</li> <li>• Hosts the Housing Month Central Event every October on themes related to energy efficiency</li> </ul> <p>(4) Future efforts</p> <ul style="list-style-type: none"> <li>• Participate in Housing Month Central Event 2014</li> </ul>
Japan Mining Industry Association	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• Constructed zero-emission power plants (geothermal power)</li> <li>• Proactively promoted the use of recycled material from a LCA perspective.</li> <li>• Engaged in efforts to improve energy intensity through the operation and management of major facilities by introducing inverters in drainage facilities and installing LED lighting.</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Developed coil products and heat thermoelectric conversion elements and contributed to improving the fuel efficiency of automobiles</li> <li>• Promoted and disseminated lead storage batteries that contribute to the stabilization and smoothing of output of solar power</li> <li>• Reduced CO2 emissions by introducing zero-emission power plants (geothermal)</li> </ul> <p>(3) Efforts leading to public campaign</p> <ul style="list-style-type: none"> <li>• Enhanced the use of environmental household account books.</li> <li>• Conducted outreach activities, including environmental workshops for children and their parents and articles in in-house newsletters.</li> <li>• Contributed to the local society. For example, reduced CO2 emissions and stimulated local forestry by replacing part of the coal used as fuel and as a reducing agent with wood pellets.</li> </ul>
Lime Manufacture Association	<p>(1) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Reduced CO2 by replacing limestone with calcined lime in the iron and steel industry</li> <li>• Improved CO2 emission reductions by developing high reactivity hydrated lime</li> <li>• Promoted modal shift (shifted from truck transport to marine transport)</li> </ul> <p>(2) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Compiled a pamphlet on the uses of limestone in 2006. Annually compiles “The Limestone Industry: Environmental Efforts” since 2007 to deepen public understanding about limestone.</li> <li>• Hosted visits to plants and quarries for local residents.</li> <li>• Engaged in outreach activities through proactive participation in prefectural and regional industrial expositions.</li> <li>• Engaged in outreach activities related to efforts to reduce CO2 emissions.</li> </ul>
The Japan Rubber Manufacturers Association	<p>(1) Performance in 2013</p> <ul style="list-style-type: none"> <li>• Reduced CO2 emissions through efforts during the procurement, production, use and disposal phases.</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Under the tire labeling program initiated in January 2010, implemented a rating program for two features (rolling resistance and wet grip ratings) and presented ratings in a user-friendly manner.</li> <li>• From an LCA perspective, made improvements in the performance of tires and non-tire products.</li> </ul> <p>(2) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Conducted activities serving to reduce CO2 emissions in the fields of local activity, forest planting and conservation, environmental education and funds.</li> </ul>
The Federation of Pharmaceutical Manufacturers’	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• Engaged in efforts to efficiently transport pharmaceuticals by using cooperative transport systems, and promoted the introduction of high fuel-efficiency vehicles to</li> </ul>

Associations of Japan	<p>reduce CO2 emissions from commercial vehicles.</p> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Substantially reduced the use of HFC, a GHG.</li> <li>• Promoted more lightweight packaging of pharmaceuticals.</li> </ul> <p>(3) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Promoted energy savings at home by introducing an in-house "eco-point" program</li> </ul>
Flat Glass Manufacturers Association of Japan	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• Conducted LCA of Eco-glass (multi-layered low-e glass that fulfills next-generation energy efficiency standards). The increased GHG emissions during production can be recovered in a short period of time due to reductions in air conditioning load.</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• The estimated dissemination rate of multi-layered glass (in terms of glass area coverage) in new housing in fiscal 2013 was: 96.1% in stand-alone housing units and 73.2% in collective housing units. Reduced 262,000t-CO2 annually.</li> <li>• Developed products that do not require scaffolding in order to promote the wider use of Eco-glass in office buildings/</li> </ul> <p>(3) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Conducted campaigns targeted at general consumers (used travelling hands-on displays, established a logomark, opened a special website, conducted outreach via various media).</li> </ul>
Japan Federation of Printing Industries	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• Promoted the use of plant-based ink.</li> <li>• Used waste heat from deodorizing equipment and reviewed the return rate of waste</li> <li>• Developed collective engine control systems, installed inverter-controlled air conditioning and engine motors, improved catalyst performance.</li> <li>• Provided carbon-offset products based on carbon footprints.</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Established the Printing Service Green Standard as an industrial standard for environment-friendly printing services and promoted CO2 emission reductions. Also developed thinner packaging material for PET bottles, etc. and engaged clients in CO2 reduction efforts.</li> </ul> <p>(3) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Participate in Eco Products 2013.</li> <li>• Labeled printed products manufactured by environment-friendly methods with a "GP" label.</li> </ul> <p>(4) Future efforts</p> <ul style="list-style-type: none"> <li>• Collaborate with clients to develop energy-efficiency printing systems and auxiliary equipment.</li> <li>• Participate in Eco Products 2014.</li> </ul>
Japan Aluminium Association	<p>(1) Performance in 2013</p> <ul style="list-style-type: none"> <li>• Continuously promoted the recycling of aluminum cans.</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Reduced CO2 emissions through the use of aluminum to manufacture more lightweight automobiles.</li> <li>• Reduced CO2 emissions through the use of aluminum to manufacture more lightweight rolling stock.</li> </ul> <p>(3) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Conducted outreach programs to promote the recycling of aluminum cans. Awarded best practices.</li> <li>• Enhanced locations for collecting aluminum.</li> <li>• Promoted outreach and educational activities.</li> </ul> <p>(4) Future efforts</p> <ul style="list-style-type: none"> <li>• Continue aluminum recycling operations and efforts to make it an established activity among the general public to return cans.</li> </ul>
Brewers Association of Japan	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• Started the calculation of CO2 emissions from the entire value chain.</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Manufactured beer products using green electricity (green energy label)</li> <li>• Collaborated with other industries to launch a "Carbon Offset Campaign."</li> </ul>

	<ul style="list-style-type: none"> <li>• Developed lightweight containers and packaging (glass bottles, can cylinders, can lids, cardboard)</li> </ul> <p>(3) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Conducted outreach activities via CSR reports and other booklets.</li> <li>• Conducted outreach activities, including hosting environmental education programs and seminars for audiences outside the company.</li> </ul> <p>(4) Future efforts</p> <ul style="list-style-type: none"> <li>• Continue abovementioned measures based on their effectiveness.</li> </ul>
The Japanese Electric Wire&Cable Makers' Association	<p>(1) Evaluation from an LCA-based perspective</p> <ul style="list-style-type: none"> <li>• Substantially reduced CO2 emissions by replacing conventional metal cables with optical fiber cables.</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Promoted the Japan-led development of an IEC standard for the conductor size of the optimal electric wire and cable.</li> <li>• Given that technologies to size up conductors increase energy efficiency, established a Japanese Cable and Wire Makers' Association (JCS) standard and engaged in public relations activities.</li> </ul> <p>(3) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Promoted environmental household bookkeeping among employees and their families. Encouraged continued efforts by awarding good practices.</li> </ul>
Japan Dairy Industry Association	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• Formulated the Japan Dairy Industry Association's Voluntary Action Plan on the Environment and identified common challenges to be addressed and checked progress in the Environmental Committee and relevant working groups.</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Adopted thinner, lightweight packages; improved the recyclability and separatability of packages</li> <li>• Adopted more lightweight glass bottles and promoted their reuse.</li> <li>• Mixed mulch into activated sludge to reduce surplus sludge by 30%, thus reducing CO2 emissions during the transport phase.</li> </ul> <p>(3) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Promoted milk carton recycling.</li> <li>• Conducted environmental conservation activities in areas around plants and business locations</li> <li>• Promoted Cool Biz and Warm Biz clothing; introduced daylight savings time; promoted green procurement .</li> </ul>
Japan Copper and Brass Association	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• Reduced CO2 emissions by manufacturing thinner copper sheets, and thus reducing production volume</li> <li>• Increased the use of recycled copper to reduce energy consumption in the copper refining process.</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• For example, grooved copper tubes used in air conditioner heat exchangers can reduce emissions 2.55 million t-CO2 is certain assumptions are made.</li> </ul>
The Japan Society of Industrial Machinery Manufacturers	<p>(1) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Reduced CO2 emissions through the development and dissemination of energy-saving products, including a high-speed all-purpose inline pump with a built-in controller, drum-pump systems, and injection molding.</li> </ul> <p>(2) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Promoted diverse campaigns (environmental household bookkeeping, purchasing environmental products and services, eco-driving, commuting by bicycle, carrying portable shopping bags, managing air conditioning temperature, turning the lights off when not in use)</li> </ul>
The Japan Bearing Industrial Association	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• Bearings support the rotation of automobiles, various machines and equipment and help mitigate friction, and therefore the products inherently save energy. Improved performance developing smaller and lighter low-torque bearings.</li> </ul> <p>(2) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Publicly communicated corporate environmental policies via CSR reports and other corporate reports.</li> </ul>

	<ul style="list-style-type: none"> <li>Conducted educational and outreach activities, including issuing environmental household account books, establishing an “environmental month,” and issuing an environmental newsletter.</li> </ul>
Japan Sanitary Industry Equipment Association	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>Employed LCA throughout the industry and promote the development of environment-friendly products.</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>Reduced CO2 emissions by developing and disseminating energy-saving toilets, prefabricated bathrooms, system and kitchen units. -</li> </ul> <p>(3) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>Continued efforts related to environmental household bookkeeping.</li> <li>Educate the public by presenting an energy-savings guide in the summertime.</li> <li>Held workshops around the world for elementary school students to learn about the importance of water.</li> </ul>
Japan Soft Drink Association	<p>(1) Evaluation from an LCA perspective</p> <ul style="list-style-type: none"> <li>Reduced 31,500t-CO2 from the transportation phase by increasing the in-house production rate of PET bottles</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>Reduced the use of fossil fuel resources and thus CO2 emissions by adopting biomass labels and PET resins of plant origin</li> <li>Adopted lightweight PET bottles that can be crushed and rolled.</li> <li>Expanded business-to-business relations through mechanical recycling.</li> <li>Installed more vending machines that impose less environmental burden.</li> </ul> <p>(3) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>Introduced daylight-saving time</li> <li>Conducted environmental education programs for all employees.</li> <li>Conducted environmental education programs for children.</li> </ul>
Limestone Association of Japan	<p>(1) Reduction potential and performance in 2013 / contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>Made an effort to constantly supply high-quality limestone for the expanded utilization of waste fuels at cement plants.</li> </ul> <p>(2) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>Implemented the Cool Biz and Warm Biz campaigns; participated in “No My Car Day” campaigns</li> </ul> <p>(3) Future efforts</p> <ul style="list-style-type: none"> <li>Continue to take note of efforts made by the cement industry, the largest limestone user and promote product quality improvements and stable supply.</li> </ul>
Japan Machine Tool Builders' Association	<p>(1) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>Promoted energy savings by adopting high-efficiency motors, inverter-controlled oil pressure equipment, and accumulators.</li> <li>Promoted energy savings by integrating processes conventionally done by different equipment into one process.</li> <li>Reduced electric power consumption by not only optimizing processes but also shifting from oil pressure to electric power and automated processes.</li> <li>Promoted energy savings by increasing the precision and quality of processing.</li> </ul>
Flour Millers Association	<p>(1) Performance in 2013</p> <ul style="list-style-type: none"> <li>Promoted higher efficiency in logistics by shifting to lorry transport from product packaging and utilizing train and ship transport.</li> </ul>
The Shipbuilders' Association of Japan and the Cooperative Association of Japan Shipbuilders	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>Collaborated with other marine transport industry organizations to conduct joint research on new environmental ships for CO2 emission reductions from international marine transport.</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>With an aim to develop ships that can reduce CO2 emissions by 50%, improved the propulsion system (improved propeller efficiency, etc.), the body system (development of optimal ship body forms; reduction of friction resistance), the engine system (improved diesel engine efficiency; development of a waste heat recovery system), the operation system (optimal operation system)</li> </ul> <p>(3) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>Held two workshops annually for all employees based on The Book of Energy Savings</li> </ul>

	<p>at Home.</p> <ul style="list-style-type: none"> <li>• Distributed an Environmental Planning Book to all employees, including those employed at partner companies.</li> <li>• Promoted the “No My Car Day” (car sharing promotion) campaign.</li> </ul> <p>(4) Future efforts</p> <ul style="list-style-type: none"> <li>• Continue the development of new environmental ships</li> </ul>
Japan Industrial Vehicles Association	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• In order to reduce CO2 emissions from cargo handling and transport in logistics, promoted the replacement of engine-powered forklifts which use fossil fuels to battery-powered forklifts which run on electric power as well as introducing a new engine-powered forklift model with 15-30% improved fuel efficiency in order to contribute to the decarbonization of a high-load, high-operation industry whose demands often cannot be met by battery-powered forklifts..</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• In order to promote the reduction of CO2 emissions from the user phase, promoted the replacement of engine-powered forklifts which operate on fossil fuels to battery-powered forklifts which run on electric power, developed and introduced to the market a new battery-powered forklift model that requires shorter charging time and yet can operate for longer hours, and thus meets the needs of engine-powered forklift users</li> </ul> <p>(3) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Request the government to provide support measures to review and formulate regulations to facilitate the introduction and dissemination of fuel battery-powered forklifts which will emit no CO2.</li> </ul>
Japan Association of Rolling Stock Industries	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• Exchanged opinions with major rolling stock and component manufacturers and user railway companies.</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Developed lightweight stainless steel rolling stock and lightweight aluminum rolling stock and sold them to railway companies.</li> <li>• Conducted LCA-based evaluations of products with high CO2 reduction potential during the manufacturing phase. Promoted environment-friendly design by expanding products covered by such evaluations.</li> <li>• In the procurement section, reviewed the packaging of components to reduce waste. Produced pallets especially designed for components to reduce waste to zero.</li> </ul> <p>(3) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Established a recycling training facilities at a manufacturing plant. All employees were engaged in promoting the segregated disposal and recycling of waste.</li> <li>• Conducted environmental education activities at educational institutions around plants.</li> <li>• Raised energy-saving consciousness at home via in-house newsletters.</li> <li>• Saved electric power by turning lights on for a limited time and managing room temperatures, promoted Cool Biz and Warm Biz clothing</li> <li>• Improved thorough environmental education programs for employees.</li> </ul>
Japan Petroleum Development Association	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• Engaged in various activities including selling energy-saving products, introducing high fuel efficiency vehicles and low-pollution vehicles, introducing fuel cells and participating in environmental events.</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Reduced CO2 emissions in the user phase by increasing natural gas production</li> <li>• Contributed to the acceleration of natural gas introduction by constructing LNG and GTL production plants, developing catalysts for hydrogen production, and manufacturing cells for fuel cells.</li> <li>• From an LCA perspective, reduced GHG emissions by expanding the natural gas pipeline network and enabling the distribution of LNG to distant users by employing tank lorries.</li> </ul> <p>(3) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• In addition to the activities referred to in (1), purchased products meeting green procurement standards, provided support for customers in their energy-saving efforts and gave lectures at universities and academic meetings.</li> </ul>



## 2. Energy conversion sector

Industry	Examples of efforts to cooperate among interested parties
The Federation of Electric Power Companies	<p>(1) Dissemination of high-efficiency electric appliances</p> <ul style="list-style-type: none"> <li>• Implemented measures to disseminate Japan’s advanced technologies, including high-efficiency electric appliances, such as heat pumps.</li> </ul> <p>(2) Introduction of smart meters</p> <ul style="list-style-type: none"> <li>• Implemented measures to achieve the government target of “introducing smart meters in all households and plants in the early 2020s.</li> </ul> <p>(3) Efforts leading to public campaigns</p> <p>Proactively promoted efforts that will serve to promote energy savings and CO2 reductions among customers</p> <ul style="list-style-type: none"> <li>• Provided energy-saving information on websites./</li> <li>• Distributed calendars and household account books introducing energy-saving ideas.</li> <li>• Hosted exhibitions on energy-saving proposals and seminars on energy-saving; implemented educational activities on the environment and energy</li> <li>• Visited customers to measure the electric current of electric appliances and provide advice on contracts and energy-savings.</li> <li>• Implemented environmental education programs for employees, including an Environmental Trainer Program and “e-learning”</li> </ul>
Petroleum Association of Japan	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• Proactively engaged the development and dissemination of high-efficiency oil appliances (latent heat recovery-type oil water heater Eco-feel, high-efficiency commercial boilers, etc.) in order to promote global warming countermeasures in the household and commercial sectors, where oil products are used.</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Engaged in efforts to introduce biomass fuels</li> <li>• Improved fuel efficiency by developing sulfur-free fuels in vehicles</li> <li>• Developed fuel-efficient engine oil.</li> </ul> <p>(3) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Promoted environmental education activities</li> <li>• Implemented the “Cool Biz” and “Warm Biz” campaigns.</li> <li>• Saved electric power by dimming lights or taking out some fluorescent lights</li> <li>• Purchased environment-friendly products</li> <li>• Conducted forest and Satoyama conservation activities</li> </ul>
The Japan Gas Association	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• Advanced towards Gas Vision 2030 by promoting and disseminating cogeneration, establishing Ene-farm Partners, and supporting the development of human resources specializing in fuel conversion.</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Promoted the dissemination and expansion of natural gas cogeneration systems in the industrial and commercial and other sectors.</li> <li>• In the household sector, engaged in efforts to disseminate fuel cells for households, gas engine-type water heaters, and latent heat recovery-type water heaters, as energy savings in water heating, a large source of household energy consumption.</li> <li>• Promoted the introduction of natural gas vehicles</li> </ul>

## 3. Commercial and other sectors

Industry	Examples of efforts to cooperate among interested parties
Japan Association of Refrigerated Warehouses	<p>(1) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Conducted maintenance and management of optimal storage temperatures to prevent the generation of unnecessary energy in keeping food fresh.</li> </ul> <p>(2) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Conducted employee training based on the acquisition of green management certification.</li> </ul>
Japan Franchise	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• Reduced CO2 emissions by introducing new ATM models, heat exchangers for air</li> </ul>

Association	<p>conditioning equipment, inverter-controlled freezers for refrigeration, integrated heat utilization systems, etc.</p> <ul style="list-style-type: none"> <li>• Halved fluorescent lighting by introducing internally illuminated signboards using reflectors.</li> <li>• Sold products with emission allowances.</li> <li>• Encouraged the nonuse of plastic grocery bags.</li> <li>• Introduced solar power and installed fast chargers for EVs</li> </ul> <p>(2) Future efforts</p> <ul style="list-style-type: none"> <li>• Replace conventional containers with those made from recycled material, develop thinner food wraps</li> <li>• Develop energy-saving copy machines</li> <li>• Introduce heat exchangers</li> <li>• Continue sales of products with emission allowances</li> </ul>
Japan LP Gas Association	<p>1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• Engage in efforts to promote and disseminate high-efficiency LP gas appliances (residential fuel cells, high-efficiency water heaters, etc.)</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Reduced CO2 emissions through solar cell sales and production</li> <li>• Developed energy-saving products</li> <li>• Sold energy-saving appliances</li> </ul> <p>(3) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Participated in the "Lights Down" campaign.</li> <li>• Implemented an in-house Eco-Point program and Eco-Challenge campaign.</li> </ul> <p>(4) Future efforts</p> <ul style="list-style-type: none"> <li>• Continue efforts to promote and disseminate high-efficiency LP gas appliances, etc.</li> </ul>
The Real Estate Companies Association of Japan	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• Collaborated with the Japan Building Owners and Managers Association, the Japan Federation of Construction Contractors, and energy business operators to engage in green innovation partnership activities in office buildings and condominiums (promoted the commercialization and dissemination of research and innovative technologies regarding ZEB and ZEH) and proactively communicated achievements.</li> <li>• Utilized and disseminated the idea of evaluating the environmental value of real estate so that diverse market participants, including tenants, buyers, investors and financial institutions, could conduct fair evaluations of environmental real estate.</li> <li>• Distributed "Eco-Guide for Houses (condominiums and houses)" to customers buying condominiums in pursuit of lifestyle change. Communicated to a wide audience by posting the booklet on the website. Engaged in efforts to enhance environmental awareness-raising activities through collaboration with the Condominium Management Companies Association.</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Introduced environmental indicators including PAL and ERR, for newly built office buildings, and promoted CO2 emission reductions at the management stage.</li> </ul> <p>(3) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Joined environmental events including the water sprinkling project and Lights Down campaign.</li> <li>• Participated in campaigns launched by the Ministry of the Environment.</li> <li>• Implemented various power saving measures.</li> <li>• Implemented educational activities for tenants and employees</li> </ul>
The Life Insurance Association of Japan	<p>1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• Educated employees on environmental issues to increase their awareness of environmental issues.</li> <li>• Communicated corporate environmental activities to society to increase environmental consciousness among customers and business counterparts.</li> <li>• Communicated the status of corporate environmental activities via websites and newsletters.</li> <li>• Gave lectures on environmental issues to elementary school students.</li> <li>• Distributed leaflets on ways to save energy at home.</li> </ul> <p>(3) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Conducted afforestation and tree-planting activities and made donations to environmental conservation organizations.</li> </ul>

	<ul style="list-style-type: none"> <li>• Hosted seminars on environmental issues.</li> </ul> <p>(4) Efforts to conserve the environment through life insurance business operations</p> <ul style="list-style-type: none"> <li>• Renovated buildings owned for investment purposes into environment-friendly buildings</li> <li>• Introduced preferential interest rates for companies are involved in environmental conservation.</li> <li>• Promoted the shift towards paperless application documents and insurance policies.</li> </ul>
The General Insurance Association of Japan	<p>1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• Promoted educational and outreach activities on environmental issues, including hosting environmental education programs for children, encouraging casual wear throughout the year, installing solar power systems in kindergartens and preschools, conducting environmental workshops and seminars, etc.</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Offered automobile insurance discounts for automobiles with advanced environmental features; sold environment-friendly fire insurance.</li> <li>• In terms of non-insurance products and services, sold weather deliberatives and investment trusts that invest in environment-friendly companies.</li> </ul> <p>(3) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Implemented the Eco-safety Driving campaign</li> <li>• Participated in the Cool Biz and Warm Biz campaigns</li> <li>• Implemented the Lights Down campaign.</li> <li>• Hosted public workshops and seminars on environmental issues</li> <li>• Utilized recycled products and promoted green procurement.</li> <li>• Conducted carbon-offsetting by combining with carbon-offsetting options with insurance products.</li> </ul> <p>(4) Future efforts</p> <ul style="list-style-type: none"> <li>• Reduce electric power consumption by reducing overtime work and shortening work hours.</li> <li>• Collaborate with tenants in buildings in the possession of member companies to promote energy-saving activities</li> <li>• Conduct educational activities to raise consciousness among employees to save energy and resources.</li> <li>• Reduced paper use by adopting online insurance policies.</li> </ul>
Telecommunications Carriers Association	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• Five telecommunications-related organizations launched the Council for Ecology Guidelines for ICT and formulated guidelines for energy savings in ICT appliances. Guidelines are reviewed annually.</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Utilize ICT services for the achievement of a low-carbon society by achieving higher efficiency in production activities, reducing the transport of people and goods, and contributing to the reduction of society-wide electric power use and CO2 emissions.</li> <li>• Operated environment-friendly data centers employing technologies and knowhow accumulated in the promotion of energy savings in the ICT field.</li> <li>• Implemented the Environmental Solution Certification system.</li> <li>• Promoted paperless services (switched from paper billing to web-based billing, offered cloud-based operation manuals).</li> <li>• Offered environment-friendly working environments, including “telework” which enables working from home, and “mobile work” which enables working outside the office.</li> <li>• Conduct computation on servers on a network and integrated servers at a large data center to achieve comprehensive reductions in electricity consumption.</li> </ul> <p>(3) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Collaborated with local residents, local governments, and schools to conduct environmental cleanups</li> <li>• Conducted various environmental activities to reach out to employees and their families.</li> <li>• Participate d in the Challenge 25 campaign and supported the individual efforts of employees.</li> <li>• Implemented the Cool Biz and Warm Biz campaigns.</li> </ul>

Japan Foreign Trade Council, Inc.	<p>(1) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Implemented various energy-saving and environment-friendly projects (project for the development of fast-charging infrastructure for electric vehicles, industrial demand response pilot test, smart city project, development of low-carbon condominiums, lithium-ion batteries project, development and sales of LED lighting and backlights, wide sales of steel products that ensure low environmental burden, etc.)</li> <li>• Produced bioethanol and biodiesel, implemented a car-sharing program employing low fuel efficiency vehicles, expanded sales of biomass PET, expanded sales of products consuming little energy during operation, sold recycled carpets, etc.</li> </ul> <p>(2) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• For employees, conducted educational activities, promoted Eco-drive, hosted afforestation and greening activities</li> <li>• For employee families, conducted afforestation and greening activities, implemented the Eco-promotion campaign for homes, etc</li> <li>• Promoted environmental household bookkeeping</li> <li>• Conducted environmental activities, including hosting environmental workshops for a local audience</li> <li>• Held environmental courses at universities, hosted lectures on environmental laws and regulations, etc.</li> </ul>
Japanese Bankers Association	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• Engaged in efforts to moderate air conditioning temperatures to the extent possible, reduced the amount of paper used in various services, offered environment-friendly products and services to individual clients, and promoted environment-friendly loans to support business operators that practice environment-friendly business management</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Offered products that address global environmental issues (with the exception of loans) and “no-passbook” savings account services</li> <li>• Offered preferential interest rates for housing loans for housing with solar power systems.</li> </ul> <p>(3) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Promoted energy-saving efforts (switching off lights when not in use, encouraging employees to work in casual clothing, taking out unnecessary lighting and leaving some turned off, managing temperature settings of air conditioning equipment)</li> <li>• Conducted CSR activities addressing global environmental issues</li> <li>• Conducted in-house environmental education programs</li> <li>• Supported employees’ environmental efforts at home by providing relevant information in in-house newsletters.</li> <li>• Updated the “Japan Bankers Association eco map,” a website providing environmental information. Hosted a wall newspaper competition for elementary school children.</li> </ul> <p>(4) Future efforts</p> <ul style="list-style-type: none"> <li>• Enhance and add to current activities.</li> <li>• Develop unique products based on environmental studies, finance renewable energy and energy saving projects, apply to government-led subsidized interest payments.</li> </ul>
Japan Building Owners and Managers Association	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• Exchanged information on CO2 emission reduction with the Real Estate Companies Association of Japan, the Japan Federation of Construction Contractors, the electric power industry and gas industry.</li> </ul> <p>(2) Future efforts</p> <ul style="list-style-type: none"> <li>• Cooperate with the Real Estate Companies Association of Japan, the Japan Federation of Construction Contractors, the electric power industry and gas industry to exchange information on commercializing and disseminating innovative technologies.</li> </ul>

#### 4. Transportation Sector

Industry	Examples of efforts to cooperate among interested parties
The Scheduled Airlines Association of	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• Replace aircrafts with new fuel efficiency models in order to reduce fuel consumption.</li> </ul>

Japan	<ul style="list-style-type: none"> <li>• In light of shortening flight distance and duration, collaborate with domestic and overseas air traffic control authorities to introduce efficient flight methods and engage in eco-flights that will maximize CO2 emission reductions.</li> <li>(2) Contribution through low-carbon products and services <ul style="list-style-type: none"> <li>• Developed eco-tours linked with afforestation activities near airports and coral planting in Okinawa.</li> <li>• Provided customers with carbon offsetting programs</li> <li>• Introduced electric vehicles for use as airport vehicles.</li> </ul> </li> <li>(3) Efforts leading to public campaigns <ul style="list-style-type: none"> <li>• Implemented measures to lower window shades during parking to prevent the internal temperature from rising</li> <li>• Implemented environmental classes for children given by pilots</li> <li>• Engaged in awareness-raising activities by posting environmental efforts made by the airline industry on the website</li> </ul> </li> <li>(4) Future efforts <ul style="list-style-type: none"> <li>• Continue current efforts</li> </ul> </li> </ul>
The Japanese Shipowners' Association	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• Based on requests by shippers seeking to reduce CO2 emissions, promoted CO2 emission reductions by efficiently operating ships through close collaboration</li> </ul> <p>(2) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Implemented environmental education programs for employees.</li> <li>• Implemented environmental conservation campaigns</li> <li>• Provided cooperation and support for environmental surveys and research</li> </ul>
Japan Federation of Coastal Shipping Associations	<p>(1) Contributions through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Conducted awareness-raising activities by using pamphlets targeted at the shipper industry and advocated the current status of coastal shipping and its advantages in terms of energy efficiency.</li> </ul> <p>(2) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Conducted environmental awareness-raising activities to increase understanding that coastal shipping is an energy-saving means of transport by distributing material at local "Marine Festivals."</li> </ul>
All Japan Freight Forwarders Association	<p>(1) Performance in 2013</p> <ul style="list-style-type: none"> <li>• Participated in various events to encourage the public to reduce CO2 emissions through a modal shift to rail freight transport. Also implemented a rail freight transport trial campaign to promote modal shifts.</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Promoted modal shifts from other means of transport to rail freight transport</li> </ul> <p>(3) Efforts leading to public campaigns</p> <ul style="list-style-type: none"> <li>• Participated in environmental expositions to promote CO2 emission reductions through modal shifts to railway transport</li> </ul>
The Association of Japanese Private Railways	<p>(1) Performance in 2013</p> <ul style="list-style-type: none"> <li>• Implemented efforts to promote railway use and increase public awareness regarding environmental issues</li> </ul> <p>(2) Contribution through low-carbon products and services</p> <ul style="list-style-type: none"> <li>• Implemented the "Take the train to be eco-friendly" campaign.</li> <li>• Formulated "Environmental Accounting Guidelines for Private Railway Businesses" and introduced environmental accounting based on these guidelines</li> <li>• Implemented environmental education programs for employees.</li> <li>• Sold carbon-offsetting train tickets</li> <li>• Installed screens displaying the amount to electricity generated and used at a station.</li> <li>• Built parking lots for vehicles and bicycles close to the station.</li> </ul> <p>(3) Future efforts</p> <ul style="list-style-type: none"> <li>• Continue efforts to promote railway use and increase environmental consciousness</li> </ul>

## Examples of International Contribution Efforts by Participating Industries

## 1. Industrial Sector

Industry	Examples of international contribution efforts
The Japan Iron and Steel Federation	<ul style="list-style-type: none"> <li>• Held the Japan-China Steel Industry Environmental Protection and Energy Conservation Technology Conference</li> <li>• The GSEP Iron and Steel Working Group, took on the activities of the APP Iron and Steel TF (comprising 7 countries; terminated in April 2011) with more focus on environmental performance improvements and increasing the membership to promote a technology-based bottom-up approach led by Japan.</li> <li>• Given international efforts to internationally standardize calculation methods for CO2 emissions from energy-intensive industries in recent years, the Japanese iron and steel industry took the initiative in promoting the establishment of an internationally standardized calculation method based on those developed by the World Steel Association to calculate CO2 emissions and intensity levels for the iron and steel industry.</li> <li>• Industry-wide collaboration with the Japanese government on the Joint Crediting Mechanism (JCM)/ Bilateral Offset Credit Mechanism (BOCM). Conducted relevant 3 feasible studies (FS) in India and Vietnam in 2012 and one FS in India in 2013.</li> <li>• As example of international contribution through the transfer and dissemination of Japanese energy-saving technologies, hosted the Public and Private Collaborative Meeting between the Indian and Japanese Iron and Steel Industry</li> </ul>
Japan Chemical Industry Association	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• Will proactively contribute to global CO2 emission reductions by continuing to disseminate the world's highest level chemical processes, energy-saving technologies and low-carbon product abroad, in accordance with the Responsible Care initiative, a voluntary initiative to continuously secure environmental performance, safety and health and to enhance public trust and to promote communications to the public, in all processes, from product design, manufacturing, use, disposal and recycling.</li> <li>• According to an evaluation of 6 cases, the industry has global GHG reduction potential of 400 million tons.</li> <li>• Contributed to reducing GHG emissions by means of manufacturing technologies, materials and products, detoxification of HFCs, PFCs, and SF6 in the Middle East, North Africa, Russia, Europe and North America.</li> </ul>
Japan Paper Association	<p>(1) International contribution in water environmental technologies</p> <ul style="list-style-type: none"> <li>• The pulp and paper industry has developed drawing on water resources. Compiled afforestation efforts, technologies related to water irrigation and water resource utilization, efforts to foster and conserve water sources, and technologies related to waste water treatment and reuse in water-intensive paper manufacturing, in Japan and overseas.</li> <li>• In order to draw on such technologies related to water business, one member company established the Water Environment Research Laboratory, which will contribute to water-related infrastructure projects, including water supply and sewerage systems, and the treatment of waste water from factories, effluent from industrial waste treatment processes, livestock effluent, and agricultural irrigation water in Japan, Asia, Oceania, and South and North America.</li> </ul>
Japan Cement Association	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Disclosed information on the status of energy consumption for cement production, the status of energy saving technologies (facilities), the status of using waste as alternatives to energy, the status of waste utilization.</li> </ul> <p>(2) Efforts to mitigate and reduce emissions in developing countries</p> <ul style="list-style-type: none"> <li>• Efforts by individual companies <ul style="list-style-type: none"> <li>— Energy saving and environmental engineering projects in China</li> <li>— Consideration of applying the Joint Crediting Mechanism (JCM)/ Bilateral Offset</li> </ul> </li> </ul>

	<p>Credit Mechanism (BOCM) framework in Indonesia.</p> <ul style="list-style-type: none"> <li>– Awareness-raising campaigns regarding waste in Singapore and Malaysia</li> </ul> <p>(3) Activities at international conferences</p> <ul style="list-style-type: none"> <li>• Cooperated in formulating an international tool for calculating CO2 emissions from the cement industry</li> </ul>
Liaison Group of Japanese Electrical and Electronics Industries for Global Warming Prevention	<p>(1) Provision low-carbon product and services</p> <p>Provision of low-carbon energy-saving products to contribute to both the prevention of global warming at a global level and the achievement of a low carbon society in terms of both energy supply and demand.</p> <ul style="list-style-type: none"> <li>• Provided low carbon and energy saving products to the energy conversion and household sectors and contributed to both the prevention of global warming at a global level and the achievement of a low carbon society in terms of both energy supply and demand.</li> </ul> <p>(2) International cooperation for the dissemination of low-carbon and energy-saving products</p> <ul style="list-style-type: none"> <li>• Participated in international frameworks that consider methods to introduce policies for the dissemination of high-efficiency equipment and to appropriately evaluate energy-saving performance. Promoted proactive proposals and positive approaches as an industry.</li> </ul> <p>(3) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• Estimated emission reduction contributions by power generation, household appliances, ICT products and solutions</li> </ul> <p>(4) Efforts to mitigate and reduce emissions in developing countries</p> <ul style="list-style-type: none"> <li>• Given the Japanese government’s proposal of the introduction of a Joint Crediting Mechanism (JCM)/ Bilateral Offset Credit Mechanism (BOCM) in the Asian region, evaluated and announced the feasibility of possible global warming countermeasures to be taken in developing countries by the industry for its adoption.</li> </ul> <p>(5) Future efforts</p> <ul style="list-style-type: none"> <li>• Estimate the potential contribution to emission mitigation of low-carbon energy-saving products and services in 2020 and 2030, with 2005 as the baseline year.</li> </ul>
Japan Federation of Construction Contractors	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Scheduled to submit a paper on “global warming countermeasures during the construction phase” to the American Society of Civil Engineers.</li> </ul>
Japan Automobile Manufacturers Association, Inc. (JAMA) Japan Auto-Body Industries Association, Inc. (JABIA)	<p>(1) Reduction potential and performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Promoted energy savings at members’ overseas production facilities and ensured improvements in energy intensity</li> <li>• Introduced wind and solar power generation systems, promoted the replacement of diesel-powered systems with natural gas cogeneration, acquired ISO50001 certification, conducted energy efficiency diagnoses at overseas facilities and provided guidance, utilized waste heat from the painting process, etc.</li> </ul> <p>(2) Activities at international conferences</p> <ul style="list-style-type: none"> <li>• Participated in UN conferences to develop the Worldwide Harmonized Light Vehicles Test Procedures (WLTP), adopted in March 2014.</li> <li>• Participated in meetings on the formulation of global technical regulations for hydrogen fuel cell vehicles (HFCV-gtr) and made revisions based on HFCV-gtr and other existing international standards.</li> </ul> <p>(3) International contribution using environmental technology and know-how to counter air and water pollution</p> <ul style="list-style-type: none"> <li>• Reused more than 90% of waste water and prevented the depletion of groundwater</li> <li>• Cooperated with cement manufacturers to recycle paint sludge and sewage sludge from painting and waste water treatment processes to cement.</li> <li>• Acquired ISO14001 certification in all global business units.</li> <li>• Introduced low-VOC paints in the painting process new equipment for VOC reduction</li> <li>• Introduced deodorizing equipment for in relation with air pollution</li> </ul> <p>(4) Future efforts</p> <ul style="list-style-type: none"> <li>• Continue past efforts</li> </ul>
Japan Federation of Housing Organizations	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Participated in the International Housing Association (IHA) Annual Meeting and exchanged information on environmental issues, etc. with member countries</li> </ul>

	<p>(2) Efforts to mitigate and reduce emission in developing countries</p> <ul style="list-style-type: none"> <li>• Communicated information to willing developing countries on Japan's advanced housing production technologies in accordance with local circumstances</li> <li>• Promoted low-carbon and energy-saving technologies and considered dispatching the appropriate experts for their promotion</li> <li>• Engaged in overseas afforestation activities as a part of corporate business plans, with an aim to enhance the living environment for local citizens,</li> </ul>
Japan Mining Industry Association	<p>(1) Reduction potential and performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Constructed a 4500KW self hydroelectric generating plant at the Huanzala Mine in Peru and provides approximately 400KW of electricity to the local community free of cost. Uses the electricity in mining and ore processing.</li> <li>• In 2007, connected to the national grid to establish a system to buy electric power from the grid during the dry season in times of power shortage due to water level declines.</li> <li>• Constructing a 1000KW hydroelectric plant to replace diesel generators at the Pallca Mine in Peru.</li> <li>• In October 2012, started electric power generation at a waste treatment facility in Thailand utilizing excess steam from a waste heat boiler</li> </ul> <p>(2) Efforts to mitigate and reduce emissions in developing countries</p> <ul style="list-style-type: none"> <li>• Surveyed energy consumption at overseas mines in which companies hold more than 50% interest and proposed energy saving measures</li> <li>• Fully implemented labor-saving, energy-saving and environmental burden-reducing technologies, and exported technology to Asian countries.</li> </ul> <p>(3) Activities at international conferences</p> <ul style="list-style-type: none"> <li>• At a meeting hosted by the International Council on Mining and Metals (ICMM), delivered a presentation on the status of resource acquisition and CO2 emissions, and exchanged opinions.</li> </ul> <p>(4) International contribution employing environmental technologies and know-how to solve air and water pollution and other pollution issues</p> <ul style="list-style-type: none"> <li>• Implemented precious metals recovery projects, home appliances recycling projects, and industrial waste treatment projects, thus contributing to environmental conservation</li> </ul> <p>(5) Future efforts</p> <ul style="list-style-type: none"> <li>• Continue to survey energy consumption at overseas mines and propose energy-saving solutions using state-of-the-art energy-saving technologies.</li> <li>• Contribute to environmental conservation using state-of-the-art environmental technologies</li> <li>• Consider the introduction of a Joint Crediting Mechanism (JCM)/ Bilateral Offset Credit Mechanism (BOCM) for overseas CO2 emission reductions)</li> </ul>
Lime Manufacturing Association	<p>(1) Activities at international conferences</p> <ul style="list-style-type: none"> <li>• Compared the energy efficiency of Japan's lime manufacturing processes and relevant CO2 emissions and joined the International Lime Association to seek new global warming prevention-related technologies and exchange information</li> </ul>
Japan Rubber Manufacturers Association	<p>(1) Reduction potential and performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Transferred energy-saving production technologies (cogeneration systems, high-efficiency manufacturing facilities) overseas</li> <li>• Increased overseas production and sales of energy-saving products (high fuel efficiency tires, energy-saving belts, products for insulation use, etc.)</li> </ul> <p>(2) Efforts to mitigate and reduce emissions in developing countries</p> <ul style="list-style-type: none"> <li>• Contributed by implementing highly efficient production practices at local plants and disseminating energy-saving products as provided in (1)</li> </ul> <p>(3) International contribution employing environmental technologies and know-how to solve air and water pollution and other pollution issues</p> <ul style="list-style-type: none"> <li>• Implemented measures in China and the EU</li> </ul> <p>(4) Future efforts</p> <ul style="list-style-type: none"> <li>• Continue to promote international contribution through highly efficient production practices and energy-saving products; promote a tire labeling scheme for the dissemination of such products .</li> </ul>



The Federation of Pharmaceutical Manufacturers' Associations of Japan	<p>(1) Reduction potential and performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Japan leads the world in reducing the use of HFCs in metered dose inhalation aerosols and can contribute to global GHG emission reductions by introducing relevant technologies overseas</li> <li>• In accordance with the globalization of the pharmaceuticals market, overseas production of pharmaceuticals is expected to increase. Contribute to reducing environmental burden and energy consumption overseas by introducing the most advanced domestic pharmaceutical manufacturing technologies.</li> </ul>
Flat Glass Manufacturers Association of Japan	<p>(1) Reduction potential and performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Introduce CO<sub>2</sub>-reducing production technologies, including the total oxygen combustion method developed in Japan, overseas (China, Europe) in order to contribute to global CO<sub>2</sub> reductions.</li> </ul>
Japan Federation of Printing Industries	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Promoted information exchange, including introducing energy-saving activities at the World Printing Congress, the Forum of Asian Graphic Arts Technologies (FAGAT), etc.</li> </ul> <p>(2) Activities at international conferences</p> <ul style="list-style-type: none"> <li>• Promoted international contribution, including exchanging information with other countries and introducing energy-saving activities at the World Printing Congress, the Forum of Asian Graphic Arts Technologies, etc.</li> <li>• Considered the development of ISO standards for paper recycling and deinking</li> </ul>
Japan Aluminium Association	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Communicated information on reducing environmental burden through the use of aluminum products via the Internet, etc. in cooperation with the International Aluminium Institute (IAI), The Aluminum Association of the US, the European Aluminum Association, etc.</li> </ul> <p>(2) Efforts to mitigate and reduce emissions in developing countries</p> <ul style="list-style-type: none"> <li>• Implemented environment-friendly business management practices fostered in Japan</li> </ul> <p>(3) Activities at international conferences</p> <ul style="list-style-type: none"> <li>• Exchanged information at meetings of the IAI and introduced best practices, including new state-of-the-art aluminum recycling processes developed in Japan at the Aluminum Forum hosted by the China Nonferrous Metals Industry Association</li> </ul>
Brewers Association of Japan	<p>(1) Reduction potential and performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Exchanged information with overseas affiliates whose energy efficiency levels were below Japanese levels and considered the introduction of successful practices in Japan</li> </ul> <p>(2) International contribution employing environmental technologies and know-how to solve air and water pollution and other pollution issues</p> <ul style="list-style-type: none"> <li>• Developed technologies to extract bioethanol</li> <li>• Cooperated in a project to support the establishment of a pollution control management (PCM) system in Vietnam and hosted environment-related training programs for Vietnamese engineers at factories in Japan</li> </ul> <p>(3) Future efforts</p> <ul style="list-style-type: none"> <li>• Continue development and work towards the practical application of bioethanol extraction technologies</li> <li>• Accept additional requests to support the development of a Vietnamese PCM systems</li> </ul>
The Japanese Electric Wire & Cable Makers' Association	<p>(1) Reduction potential and performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Promoted the development of an IEC standard for the conductor size of the optimal electric wire and cable</li> </ul>
Japan Copper and Brass Association	<p>(1) Reduction potential and performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Installed state-of-the-art energy-saving facilities and technologies in new overseas operations</li> </ul> <p>(2) International contribution employing environmental technologies and know-how to solve air and water pollution and other pollution issues</p> <ul style="list-style-type: none"> <li>• Installed state-of-the-art energy-saving facilities and technologies in new overseas operations</li> </ul>
The Japan Society of Industrial Machinery Manufacturers	<p>(1) Reduction potential and performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Employed the technologies fostered by the industrial machinery industry in resource and energy development and infrastructure improvements in emerging and developing</li> </ul>

## (Attachment 4)

	<p>counties, therefore contributing to the creation of a low carbon society and the protection of the global environment</p> <p>(2) Future efforts</p> <ul style="list-style-type: none"> <li>• Continue multidimensional contributions, including supplying world-leading environmental and energy-saving equipment, and providing energy-saving technologies and products in infrastructure improvements and production facilities</li> </ul>
Japan Bearing Industrial Association	<p>(1) Reduction potential and performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Expanded business with due consideration of the local status of environmental conservation</li> </ul> <p>(2) Efforts to mitigate and reduce emissions in developing countries</p> <ul style="list-style-type: none"> <li>• Introduced Japan's advanced technologies, which have been highly evaluated</li> <li>• Reduced CO2 emissions by eliminating unnecessary factory processes</li> <li>• Saved electric power by optimizing electric power use in factories</li> </ul> <p>(3) International contribution employing environmental technologies and know-how to solve air and water pollution and other pollution issues</p> <ul style="list-style-type: none"> <li>• Recycled wastewater from factories in Thailand and China to the maximum extent possible with the aim of operating zero-wastewater discharge factories</li> </ul>
Japan Soft Drink Association	<p>(1) Past performance</p> <ul style="list-style-type: none"> <li>• Provided support for the introduction of lightweight PET bottles in the French soft drink industry.</li> <li>• Compiled a database on environmental data regarding overseas affiliates for use in establishing a support system for CO2 emission reductions</li> <li>• Supported a Sri Lankan tea plantation in acquiring Rainforest Alliance certification</li> </ul>
Japan Machine Tool Builders' Association	<p>(1) Reduction potential and performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Machine tools manufactured in Japan possess world-class machining performance and efficiency and contribute to achieving higher efficiency in overseas factories.</li> <li>• Contributed to reducing CO2 emissions overseas by disseminating high environmental performance Japanese machine tools</li> </ul>
; The Shipbuilders' Association of Japan and the Cooperative Association of Japan Shipbuilders	<p>(1) Reduction potential and performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Proactively developed environment-friendly ships to reduce CO2 emission from international maritime transport.</li> </ul> <p>(2) Efforts to mitigate and reduce emissions in developing countries</p> <ul style="list-style-type: none"> <li>• Abided by regulatory targets for air and water quality and reduced CO2 emissions.</li> <li>• Conducted integrated diesel and biomass-fired power generation operations covering engineering, construction, operation and maintenance</li> </ul> <p>(3) Activities at international conferences</p> <ul style="list-style-type: none"> <li>• Proactively participated in CO2 emission reduction efforts under the International Maritime Organization (IMO) and the International Standardization Organization (ISO) as a member of the Japanese delegation.</li> </ul> <p>(4) International contribution employing environmental technologies and know-how to solve air and water pollution and other pollution issues</p> <ul style="list-style-type: none"> <li>• Promoted the prevention of pollution and global warming through products and services based on green innovation activities</li> <li>• Made international contributions by selling environment-friendly products, including wastewater treatment equipment, desulfurization and denitrification equipment and bag filters.</li> <li>• Implemented measures to reduce CO2 emission from ships</li> <li>• Installed of ballast water management equipment; operated converted (repaired) ships</li> <li>• Contributed to the reduction of NOx and PM emissions</li> </ul> <p>(5) Future efforts</p> <ul style="list-style-type: none"> <li>• Continue development of environment-friendly ships to reduce CO2 emissions from international maritime transport.</li> </ul>
Japan Industrial Vehicles Association	<p>(1) International contribution employing environmental technologies and know-how to solve air and water pollution and other pollution issues</p> <ul style="list-style-type: none"> <li>• Made efforts to disseminate technologies and products meeting strict domestic environmental regulations overseas</li> </ul>
Japan Association of	<p>(1) Performance in fiscal 2013</p>

Rolling Stock Industries.	<ul style="list-style-type: none"> <li>• Exported rolling stock using lightweight aluminum alloys overseas</li> <li>• Launched the “Eco Challenge for a Greener Tomorrow” campaign in 2010 targeting the US and EU</li> <li>• Launched environmental communications with China in 2012, in line with those with the US and EU</li> </ul> <p>(2) Efforts to mitigate and reduce emissions in developing countries</p> <ul style="list-style-type: none"> <li>• Ensured conformity with regulations on environmental burden and safety standards in other countries and applied technologies to reduce environment burden developed in Japan to exported rolling stock, thus promoting international contribution to the achievement of a low carbon society.</li> <li>• Engaged in mangrove conservation and afforestation activities</li> </ul> <p>(3) Future efforts</p> <ul style="list-style-type: none"> <li>• Transport lightweight stainless steel rolling stock to Thailand</li> <li>• Contribute to modal shifts overseas by exporting environment-friendly rolling stock, thus contributing to emission reduction.</li> </ul>
Japan Petroleum Development Association	<p>(1) Reduction potential and performance in fiscal 2013 / efforts to mitigate and reduce emissions in developing countries</p> <ul style="list-style-type: none"> <li>• Implemented GHG reduction measures (utilization of associated gas, injection of associated gas utilization of waste heat, afforestation, reduction of diffuse gas, reduction of residual gas through combustion (reuse))</li> </ul> <p>(2) Activities at international conferences</p> <ul style="list-style-type: none"> <li>• Participated in and cooperated with IEA-GHG, an international research and development program on CO2 capture and storage (CCS) technologies. Also participated in and cooperated with the Global CCS Institute, an organization led by the Australian government to promote CCS demonstration projects.</li> </ul>

## 2. Energy Conversion Sector

Industry	Examples of international contribution efforts
The Federation of Electric Power Companies of Japan	<p>(1) Efforts to mitigate and reduce emissions in developing countries</p> <p>① Participated in the Global Superior Energy Performance Partnership (GSEP)</p> <ul style="list-style-type: none"> <li>• GSEP comprises 6 working groups, of which the Power WG aims to contribute to promoting energy savings and achieving CO2 emission reductions through proposals for improvements in operation and maintenance technologies that serve to improve heat efficiency at coal-fired thermal power plants and the sharing of advanced technologies and know-how in power generation, transmission and distribution.</li> <li>• Conducted workshops with the aim to share information on best practices regarding power transmission and distribution and demand management technologies. This included a peer review on operation and maintenance (O&amp;M) technologies at an overseas thermal power plant which involved seminars on power transmission and distribution and demand management technologies, facility diagnosis and analysis of operational data.</li> <li>• Will continue to support the decarbonization of developing countries by transferring and providing Japanese electric power-related technologies under GSEP, which embodies the Japan-led sectoral approach.</li> </ul> <p>② Efforts related to overseas business operations</p> <ul style="list-style-type: none"> <li>• Conducted feasibility studies and demonstration projects under the Joint Crediting Mechanism (JCM)/ Bilateral Offset Credit Mechanism (BOCM) and participated and cooperated in other overseas projects in order to engage in efforts to save energy and reduce CO2 emissions.</li> </ul> <p>(2) Activities at international conferences</p> <p>① Efforts under the International Electricity Partnership (IEP)</p> <ul style="list-style-type: none"> <li>• Established the International Electricity Partnership (IEP) in October 2008 with electric power company federations in the US and Europe with the aim to exchange views and jointly communicate information on climate change issues in developed countries and other issues commonly challenging the electric power sector in each country.</li> <li>• Hosted a workshop at COP15 to announce the Roadmap for a Low-Carbon Power</li> </ul>

	<p>Sector by 2050, a technological roadmap formulated by the IEP.</p> <ul style="list-style-type: none"> <li>• Agreed at Japan-USA-Europe Power Summit held in Rome, Italy in October 2011 to cooperate with IEP in GSEP's activities.</li> <li>• Will continue to aim to achieve society-wide decarbonization by developing and introducing advanced and feasible electric power technologies through international efforts.</li> </ul>
Petroleum Association of Japan	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• The petroleum industry, in collaboration with Japan Cooperation Center, Petroleum (JCCP) and other relative organizations, engaged in petroleum-related technological cooperation, including energy saving, air and water pollution, waste management, etc., with oil-producing countries and Asian countries by continuously dispatching technicians and accepting trainees.</li> <li>• In 2013, implemented projects to dispatch experts, accept trainees, improve infrastructure and conduct joint research, and host the Joint GCC-Japan Environment Symposium.</li> </ul> <p>(2) Efforts to mitigate and reduce emissions in developing countries</p> <ul style="list-style-type: none"> <li>• Engaged in petroleum-related technological cooperation, including energy saving, air and water pollution, waste management, etc., with oil-producing countries and Asian countries by continuously dispatching technicians and accepting trainees via relevant organizations.</li> </ul> <p>(3) Activities at international conferences</p> <ul style="list-style-type: none"> <li>• A member of the International Petroleum Industry Environmental Conservation Association (IPIECA), which addressed environmental issues challenging the petroleum industry, the Petroleum Association of Japan attends relevant international conferences.</li> <li>• In terms of global warming countermeasures, participated in conferences and workshops hosted by the IPIECA to introduce efforts including the Commitment to a Low Carbon Society, made by the Japanese petroleum industry to counter global warming and to exchange view on measures taken by the petroleum industry in each country.</li> </ul> <p>(4) International contribution employing environmental technologies and know-how to solve air and water pollution and other pollution issues</p> <ul style="list-style-type: none"> <li>• Engaged in petroleum-related technological cooperation, including energy saving, air and water pollution, waste management, etc., with oil-producing countries and Asian countries by continuously dispatching technicians and accepting trainees via relevant organizations.</li> <li>• In 2013, implemented projects to dispatch experts, accept trainees, improve infrastructure and conduct joint research, and host the Joint GCC-Japan Environment Symposium,</li> </ul>
Japan Gas Association	<p>(1) Reduction potential and performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Continued to engage in disseminating and expanding city gas that serves the purpose of decarbonization. In 2013, implemented projects in Singapore and Thailand.</li> </ul> <p>(2) Efforts to mitigate and reduce emissions in developing countries</p> <ul style="list-style-type: none"> <li>• Engaged in technology transfer and exchange regarding the effective use of natural gas and environmental improvement in developing countries. Implemented projects in Malaysia, Mexico and Brazil.</li> <li>• Provided support for human resource development for city gas projects that will contribute to the global environment as well as projects.</li> </ul> <p>(3) Activities at international conferences</p> <ul style="list-style-type: none"> <li>• Participated in meetings of the International Gas Union (IGU) and the World Business Council for Sustainable Development (WBCSD) to discuss ways to properly assess the environmental advantages of city gas.</li> </ul> <p>(4) International contribution employing environmental technologies and know-how to solve air and water pollution and other pollution issues</p> <ul style="list-style-type: none"> <li>• Used carbon fiber technologies to develop an air cleaning technology using only airflow and no electric power and demonstrated in a domestic verification experiment</li> </ul>

	<p>that the air pollution concentration had been improved.</p> <ul style="list-style-type: none"> <li>• In 2009, installed activated carbon fiber (ACF) air cleaning devices in Beijing, China, where air pollution resulting from economic growth is a serious issue, on a trial basis. With the support of a local university, installed a device on a street on campus to bring verification of the effectiveness of ACF technologies in the Chinese atmospheric environment.</li> </ul> <p>(5) Future efforts</p> <ul style="list-style-type: none"> <li>• Develop business projects drawing on energy solution know-how in Southeast Asia.</li> </ul>
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### 3. Commercial and other sectors

Industry	Examples of international contribution efforts
Japan LP Gas Association	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Participated in the World LPG Association (WLPGA) and introduced Japan's high-efficiency LPG equipment at international conferences, thus arousing interest among Asian and European manufacturers, which have begun to contact Japanese manufactures.</li> <li>• Collected PET bottle caps to provide vaccination to children around the world.</li> </ul> <p>(2) Activities at international conferences</p> <ul style="list-style-type: none"> <li>• At the World LP Gas Forum last fiscal year, "Integrated Electricity Generation System Optimized by Fuel Cell," a study conducted by a member company, gained high appraisal and won the WLPGA Innovation Award. A domestic company delivered a presentation on high-efficiency equipment with an aim to globally disseminate and promote domestic high-efficiency LP gas equipment.</li> </ul> <p>(3) Future efforts</p> <ul style="list-style-type: none"> <li>• Continue to disseminate and promote high-efficiency LP gas equipment through WLPGA activities.</li> </ul>
The Real Estate Companies Association of Japan	<p>(1) Reduction potential and performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Provided China and other East Asian countries a package of measures, including high-level environmental technologies and know-how on urban revitalization and town-planning, thus contributing to the development of environment-friendly cities and the resolution of global environmental issues in the Asian region, where CO2 emissions are expected to increase most.</li> </ul>
The Life Insurance Association of Japan	<p>(1) Reduction potential and performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Participated in the UN Global Compact; implemented a coral reef conservation project in Fiji; encouraged group affiliates to participate in CSR activities including environmental activities in various regions of the world.</li> </ul>
The General Insurance Association of Japan	<p>(1) Reduction potential and performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Promoted the Zero Accident Campaigns and the Eco-Safety Drive campaign at overseas affiliates and bases</li> <li>• Introduced a virtual conference room for international conferences among group affiliates with the aim to reduce CO2 emissions from business trips</li> <li>• Contributed to and participated in launching a joint program established by the World Bank and the Japanese government.</li> <li>• Provided weather index-based insurance, which mitigates climate change-induced damages in developing countries, in northeastern Thailand.</li> <li>• Collaborated with NGOs specializing in afforestation in 9 Southeast Asian countries and planted mangroves.</li> <li>• Engaged in afforestation activities for regenerate of tropical forests and provided guidance on agricultural technology in Indonesia.</li> <li>• Explained environmental efforts at the Insurance School of Japan (ISJ) and raised awareness among international participants.</li> </ul> <p>(2) Efforts to mitigate and reduce emissions in developing countries</p> <ul style="list-style-type: none"> <li>• Donated money to an NGO engaged in reforestation activities in the Philippines in accordance with the number of eco-insurance certificates and web policy clauses selected.</li> <li>• Promoted carbon neutrality</li> </ul>

	<ul style="list-style-type: none"> <li>• Engaged in mangrove planting activities in 9 Southeast Asian countries.</li> <li>• Planted trees in a total of 400 hectares in Indonesia.</li> </ul> <p>(3) Activities at international conferences</p> <ul style="list-style-type: none"> <li>• Attended COP meeting as chairman of the Keidanren Committee on Nature Conservation. Participated in a high-level meeting hosted by the UNFCCC Secretariat as a panelist.</li> <li>• Engaged in activities as board member representing Asia at the UNEP Finance Initiative (UNEP FI)'s Principles for Sustainable Insurance (PSI).</li> <li>• Participated in the UN Principles for Responsible Investment (UN-PRI).</li> </ul> <p>(4) Future efforts</p> <ul style="list-style-type: none"> <li>• Launch research and development on methods to evaluate flood risk</li> <li>• Engage in overseas afforestation activities</li> </ul>
Telecommunications Carriers Association	<p>(1) Reduction potential and performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• The ICT Ecological Guideline Council, composed of telecommunications operators and vendors has been engaged in formulating international standards for telecommunications equipment that will serve to reduce CO2 emissions.</li> <li>• In fiscal 2013, proposed energy efficiency metrics and measurement methods for packet optical networking platforms to the International Telecommunication Union Telecommunication Standardization Sector) (ITU-T) SG5 and at the SG5 meeting in Lima in December 2013, included “Energy efficiency metrics and measurement methods” in Recommendation ITU-T L.1310.</li> </ul> <p>(2) Efforts to mitigate and reduce emission in developing countries</p> <ul style="list-style-type: none"> <li>• Engaged in joint afforestation activities with a Filipino telephone company</li> </ul> <p>(3) Activities at international conferences</p> <ul style="list-style-type: none"> <li>• Through efforts towards the international standardization of environmental impact assessment methods at the ITU-T, continuously promoted the environmental impact assessment of ICT equipment, networks and ICT services based on the Recommendation with the aim to allow companies providing or installing products or ICT services to consider not only performance and prices but also environmental indices, including contribution to CO2 emission reduction.</li> </ul> <p>(4) Future efforts</p> <ul style="list-style-type: none"> <li>• In its efforts to promote international standardization, the ICT Ecological Guideline Council will propose energy efficiency metrics and measurement methods for packet optical networking platform II tot the ITU-T SG5 in the hope of inclusion in Recommendation ITU-T L.1310 upon its revision</li> <li>• Continue efforts to mitigate and reduce emissions in developing countries and activities at international conferences</li> </ul>
Japan Foreign Trade Council, Inc.	<p>(1) International contribution employing environmental technologies and know-how to solve air and water pollution and other pollution issues</p> <ul style="list-style-type: none"> <li>• For air pollution, conducted afforestation projects (Brazil, New Zealand, Chile, Australia, Vietnam), optimized operations of incinerators and boilers by expanding sales of continuous monitoring systems of dioxins and PCB and flue gas analyzers, expanded sales of diesel exhaust filters</li> <li>• For water pollution, developed waste water, recycled water and sewerage treatment systems (Mexico, China Czech).</li> </ul>
Japanese Bankers Association	<p>(1) Reduction potential and performance in 2013</p> <ul style="list-style-type: none"> <li>• Promoted to the extent possible, “support for overseas environmental projects such as renewable energy development projects through loans and project finance” and “consideration of impacts on the local society and natural environment that may be induced by the project, when participating in a project finance scheme”.</li> <li>• 14 banks answered that they were currently “engaged” in international contribution and 7 banks answered that they were “considering”</li> </ul> <p>(2) Efforts to mitigate and reduce emissions in developing countries</p> <ul style="list-style-type: none"> <li>• Enhanced environment business networks by concluding Memorandums of Understanding with the purpose of introducing Japanese companies with environmental technologies to emerging countries, financing environmental projects, and providing know-how on emissions trading.</li> </ul>

	<ul style="list-style-type: none"> <li>• Purchased World Bank Green Bonds (bonds issued to support projects implemented in developing countries for the purpose of preventing global warming).</li> </ul> <p>(3) Activities at international conferences</p> <ul style="list-style-type: none"> <li>• Signed the UNEP Finance Initiative (UNEP FI)</li> <li>• Signed the Natural Capital Declaration at Rio+20 and participated in WGs that discuss ways to incorporate natural capital in products and services.</li> </ul> <p>(4) Future efforts</p> <ul style="list-style-type: none"> <li>• 19 banks are determined to “make additions to and reinforce current efforts.” Some banks will engage in “international project finance in renewable energy.”</li> </ul>
Japan Building Owners and Managers Association	<p>(1) Reduction potential and performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Exchanged information with Building Owners and Managers Associations in the US and Korea Building Owners and Managers Association on environmental measures</li> </ul>

#### 4. Transportation Sector

Industry	Examples of international contribution efforts
The Scheduled Airlines Association of Japan	<p>(1) Reduction potential and performance in fiscal 2013 / efforts to mitigate and reduce emissions in developing countries</p> <ul style="list-style-type: none"> <li>• Other than reducing fuel consumption by aircrafts, promoted awareness raising among employees working at overseas branches by encouraging low-key emission mitigation and reduction efforts, including recycling and saving electric power.</li> </ul> <p>(2) Activities at international conferences</p> <ul style="list-style-type: none"> <li>• Participated in environmental conservation division meetings of international airline industry organizations, including IATA、ICAO、AAPA (Association of Asia Pacific Airlines) and made constructive proposals representing East Asia, thus proactively promoting contribution to efforts to counter global warming.</li> </ul> <p>(3) International contribution employing environmental technologies and know-how to solve air and water pollution and other pollution issues</p> <ul style="list-style-type: none"> <li>• Ensured promotion of introducing new aircraft models in international flights, which fly over national borders in the airspace of other countries</li> </ul> <p>(4) Future efforts</p> <ul style="list-style-type: none"> <li>• Continue abovementioned efforts</li> </ul>
The Japanese Shipowners' Association	<p>(1) Reduction potential and performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Provided funds for the IMO GHG Study and continued to provided information for studies and research projects for CO2 emission reduction</li> </ul> <p>(2) Activities at international conferences</p> <ul style="list-style-type: none"> <li>• Led the world in its first introduction of CO2 emission regulations for international maritime transport. Ships newly constructed in 2013 and beyond are required to meet CO2 emission standards separately determined according to vessel type. Regulations are to be gradually enhanced.</li> <li>• Considered measures to reduce GHG emissions from international maritime transport at the IMO. The IMO will continue to collaborate with Japan and other governments in formulating effective reduction measures.</li> </ul>

## Examples of Innovative Technology Development by Participating Industries

## 1. Industrial Sector

Industry	Examples of innovative technology development
The Japan Iron and Steel Federation	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Promoted the CO<sub>2</sub> Ultimate Reduction in Steelmaking Process by Innovative Technology for Cool Earth 50 (COURSE50) for iron ore reduction using hydrogen and the sequestration and capture of CO<sub>2</sub></li> <li>• Promoted the development of an innovative iron-making process that replaces a certain amount of ordinary coke with ferrocoke (an alternative reduction agent to coke that is produced by dry distillation of a molded mixture of low-grade coal and low-grade iron ore) in place of ordinary coke</li> </ul>
Japan Chemical Industry Association	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Developed a inorganic separation membrane that will enable energy savings of more than 50% in the distillation process and conducted demonstration tests at real plants</li> <li>• Decided on the construction of a carbon nanotube plant with a view to enable mass production</li> <li>• Achieved world-class conversion efficiency level of over 10% for organic thin-film solar cells</li> <li>• Achieved the world's highest carrier mobility level for a carbon nano-tube thin film transistor (CNT-TFT)</li> </ul>
Japan Paper Association	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Widely promoted the development of nanofibers: A member company succeeded in manufacturing a transparent continuous sheet of cellulose nanofiber as a result of joint research conducted with an integrated chemical company. Another company launched operations at a pilot cellulose nanofiber plant and promoted the development of new applications of thickeners and packing material. Other companies provided samples of various types of nanocellulose</li> </ul>
Liaison Group of Japanese Electrical and Electronics Industries for Global Warming Prevention	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Promoted technology development for thermal power plants designed to operate at higher temperatures [gas turbines and coal gasification] and with higher efficiency by combining fuel cells</li> <li>• Participated in the Floating Offshore Wind Turbine Demonstration Project (Fukushima: 2MW and 7MW) and promoted efforts towards commercialization</li> <li>• Promoted the establishment of a high efficiency social system using ICT (e.g. smart grids, ITS and BEMS/HEMS), developed a next-generation high efficiency lighting system and improved the energy efficiency at data centers</li> </ul>
Japan Cement Association	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Implemented the Innovative Cement Manufacturing Process Fundamental Technology Development project under the initiative of member companies</li> <li>• Conducted joint research and development with the participation of 4 member companies on “energy-saving clinker production technology,” “simulation analysis of clinker production processes,” and “element technologies for developing clinker production process measuring technologies” from fiscal 2010 through fiscal 2014 in order to establish fundamental technologies that will lower the temperature and reduce the amount of time required in the most energy-intensive clinker production process, for the establishment of innovative energy-saving technologies that will enhance industry-wide competitiveness in the domestic cement industry</li> </ul>
Japan Automobile Manufacturers' Association / Japan Auto-Body Industries Association;	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Sold and measured 26 new models of next-generation automobiles (EV, PHEV, HEV), including some minor changes, in Japan</li> <li>• Continuously promoted innovative manufacturing technologies, including Wet on Wet coating</li> </ul> <p>(2) Future efforts</p>



## (Attachment 5)

Japan Automobile Manufacturers' Association / Japan Auto Parts Industries Association	<ul style="list-style-type: none"> <li>• Launch The Research association of Automotive Internal Combustion Engines (AICE) to jointly resolve issues including the development of high-efficiency low-emission automobile engines</li> <li>• Develop various technologies for the commercialization of fuel cell vehicles by the end of 2014</li> <li>• Develop and disseminate ASV and ITS technologies to mitigate heavy traffic</li> <li>• Improve the performance of lithium-ion batteries and develop post-lithium batteries</li> </ul>
Japan Mining Industry Association	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Launched development of electrolytic copper recycling processes that will enable significant reduction of electric power consumption</li> </ul> <p>(2) Future efforts</p> <ul style="list-style-type: none"> <li>• Continues energy-efficient electrolysis technology development by member companies and study ways to use hydrogen energy</li> </ul>
Japan Federation of Construction Contractors	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Compiled and introduced best practices of building design and construction applying element technologies for the decarbonization of buildings and quantitative assessment of environmental performance (CASBEE and energy saving performance) in “Best Practices of Sustainable Building.”</li> </ul> <p>(2) Future efforts</p> <ul style="list-style-type: none"> <li>• Develop element technologies for the decarbonization of buildings and promote activities to comprehensively and efficiently introduce various state-of-the-art technologies in buildings</li> </ul>
Japan Federation of Housing Organizations	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Promoted Net Zero Energy Houses (ZEH)</li> <li>• Supported and promoted the development of element technologies that will serve to improve the performance (higher intensity, higher durability) and extend the lifetime of housing</li> </ul>
The Japan Rubber Manufacturers Association	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Contributed to fuel efficiency improvements by reducing vehicle tire noise and improving aerodynamic performance</li> <li>• Reduced environmental burden by extending the life of conveyor belts and developing recycling technologies</li> </ul> <p>(2) Future efforts</p> <ul style="list-style-type: none"> <li>• Decarbonize the entire supply chain including the procurement, manufacturing, use and disposal stages by developing high-efficiency production processes and facilities, and conducting studies on innovative material</li> <li>• Tires: reduce rolling resistance, run-flat tires, lightweight tires</li> <li>• Non-tire: develop energy-saving high-performance material, next-generation auto parts</li> <li>• Apply retreading and other technologies to recycle products and waste</li> </ul>
The Federation of Pharmaceutical Manufacturers' Associations of Japan	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Shortened and optimized the reaction process in order to reduce the amount of raw material, reagents, solvents and energy used</li> <li>• Downsized on test analysis using organic solvents (liquid chromatography)</li> </ul>
The Japan Aluminium Association	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Promoted collaboration among industry, academia and government for the application of a horizontal aluminum recycling systems in automobile recycling, as such systems employing high-speed automatic sorting equipment using transmission X-rays, fluorescent X-rays and lasers have already been applied in sash recycling</li> </ul> <p>(2) Future efforts</p> <ul style="list-style-type: none"> <li>• Continue development of new aluminum recycling processes</li> </ul>
Japan Federation of Printing Industries	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Pursued higher efficiency in printing equipment (introduced high-efficiency motors and UV-LED curing light source)</li> </ul> <p>(2) Future efforts</p> <ul style="list-style-type: none"> <li>• Check the status of operations regarding the effective use of waste heat from curing</li> </ul>
Flat Glass	<p>(1) Performance in fiscal 2013</p>

Manufacturers Association of Japan	<ul style="list-style-type: none"> <li>• Renewed melting furnaces for higher efficiency in heat recovery, consolidated production by integrating kilns</li> <li>• Continued corporate efforts to minimize energy loss by improving combustion technologies and combustion equipments. Applied new technologies including the partial use of Oxyfuel in burners for melting furnaces at member companies for higher combustion efficiency</li> </ul> <p>(2) Future efforts</p> <ul style="list-style-type: none"> <li>• Develop fundamental state-of-the-art technologies including in-flight melting technologies that reduce CO2 emissions</li> </ul>
Japan Soft Drink Association	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Shifted heat sources from “steam” to “ohmic heating methods” (actual performance: 33% reduction in CO2 emissions relative to previous year levels)</li> </ul>
Japan Dairy Industry Association	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Tested and considered the introduction of technology to operate CIP with lower temperature</li> <li>• Conducted field tests on new energy-saving equipment to check effectiveness prior to introduction</li> </ul> <p>(2) Future efforts</p> <ul style="list-style-type: none"> <li>• Introduce technologies to operate CIP with lower temperature</li> <li>• Introduce energy-saving equipment once assured of their performance and optimize production facilities</li> </ul>
The Japanese Electric Wire & Cable Makers' Association	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Conducted pilot tests on technologies that enable the effective use of electric power in superconducting cable systems</li> </ul>
The Japan Bearing Industrial Association	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Developed system products for electric vehicles (EV) using motor control technologies fostered in the development of magnetic bearing and tested them in EVs converted from gasoline cars in a social experiment to check their practical performance</li> </ul>
The Japan Society of Industrial Machinery Manufacturers	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Further improved energy-saving performance of industrial machinery based on information gathering and research on inverter control and the introduction of high-efficiency motors</li> <li>• Conducted research and studies on new energy fields, such as wind power generation equipment and implemented projects for the promotion of biomass power generation</li> <li>• Conducted research and studies on trends in hydrogen stations, methods for the mass transport of hydrogen and state-of-the-art production methods to promote the utilization of hydrogen</li> <li>• Developed binary generators</li> <li>• Developed liquid hydrogen tank containers</li> <li>• Promoted projects to utilize sewerage biomass energy</li> <li>• Developed high-efficiency pumps</li> </ul> <p>(2) Future efforts</p> <ul style="list-style-type: none"> <li>• Promote collaboration with relevant industries in developing and providing high-efficiency industrial machinery and conducting surveys on industrial needs</li> </ul>
Japan Petroleum Development Association	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Developed catalysts for hydrogen production and manufactured fuel cells</li> </ul> <p>(2) Future efforts</p> <ul style="list-style-type: none"> <li>• Develop technologies related to oil and natural gas development; conduct pilot tests; and construct and operate manufacturing plants</li> <li>• Engage in efforts for the practical application of GTL technologies</li> <li>• Conduct research on sustainable carbon circulation using methane production technologies</li> </ul>
The Shipbuilders' Association of Japan	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Promoted the development of technologies to minimize energy consumption through high-efficiency and high-performance production processes</li> </ul> <p>(2) Future efforts</p> <ul style="list-style-type: none"> <li>• Continue to promote the development of technologies for higher efficiency and</li> </ul>

	performance
Limestone Association of Japan	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• A mine was awarded the Achievement Award at the Limestone Mining Industry Conference for its report on reductions in explosion costs and crusher fuel achieved due to air-deck blasting</li> </ul> <p>(2) Future efforts</p> <ul style="list-style-type: none"> <li>• Continue to draw on the Limestone Association of Japan research grant to gather research on energy-saving practices</li> </ul>
Japan Industrial Vehicles Association	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Promoted energy savings in production facilities and operations for shaping, assembling and conveying; promoted energy savings in lighting equipment and ACHV equipment</li> <li>• Promoted the development of next-generation vehicles (fuel cell cars, etc.), which have low CO2 emission levels at the product use phase</li> </ul> <p>(2) Future efforts</p> <ul style="list-style-type: none"> <li>• Continue conducting demonstration tests for fuel cell-powered fork lift</li> </ul>
Japan Association of Rolling Stock Industries	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Contributed to environmental conservation by newly developing and using the “efWING,” rolling stock bogie, significantly lighter than conventional models, thus enabling energy cost reductions</li> <li>• Improved fuel efficiency by more than 20% compared to conventional diesel cars by developing a self-charging battery-powered railway car that applies a lithium-ion battery to a hybrid diesel engine. This system is equipped with a function that can store the electricity generated by regenerative braking in a storage battery</li> <li>• Provided SiC (Silicon Carbide) power semiconductor modules loaded with a SBD for household appliances, industrial equipment and railway rolling stock devices and succeeded in the world’s first practical application of an inverter using the newly developed large-capacity full SiC power module suitable for use in a DC1500V electrification system. This inverter reduces electric power loss by approximately 55% and volume/weight by approximately 65% compared to conventional devices</li> </ul> <p>(2) Future efforts</p> <ul style="list-style-type: none"> <li>• Provide inverters using SiC power modules for railcars to railroad companies</li> <li>• Promote technology development and expanded use of storage cell-operated and fuel cell-operated railcars</li> </ul>

## 2. Energy-conversion sector

Industry	Examples of innovative technology development
The Federation of Electric Power Companies	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Developed clean coal technologies for the high-efficiency use of coal, which is characterized by high stability of supply and economic efficiency</li> <li>• Promoted research and development for the establishment of next-generation power transmission and distribution networks</li> <li>• Proactively cooperated in large-scale Government-led pilot tests</li> <li>• Promoted of technology development related to CCS</li> <li>• Promoted research and development for efficiency improvements in heat pump water heaters using CO2 refrigerants (Eco Cute)</li> <li>• Conducted other measures for efficiency improvements and the downsizing of heat pump technologies and heat and electric power storage technologies</li> <li>• Engaged in efforts to improve the user-friendliness of electric vehicles, including conducting test runs, developing chargers, and domestically and internationally standardizing fast chargers</li> </ul>
Petroleum Association of Japan	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Promoted the development of Petroleomics technology, for the advanced use of heavy</li> </ul>

	oil and applied the elemental technologies gained in improving existing equipment (e.g. analysis of the behavior of asphaltene which can cause the process to become stuck or reduce catalytic performance)
The Japan Gas Association	<p>(1) Performance in fiscal 2103</p> <ul style="list-style-type: none"> <li>• Promoted cogeneration technology development. Successfully continuously operated a pressurized SOFC-MGT hybrid power generation system for 4,000 hours for the first time in the world</li> </ul> <p>(2) Future efforts</p> <ul style="list-style-type: none"> <li>• Achieve efficiency improvements and cost reduction in cogeneration and fuel cells</li> </ul>

### 3. Commercial and other sectors

Industry	Examples of innovative technology development
Telecommunications Carriers Association	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Promoted the development of lasers capable of data transmission. In fiscal 2013, developed a technology that reduced the energy consumption for 1-bit data transmission to 5.5 fJ*3, or less than one-tenth that of conventional surface-emitting lasers</li> </ul> <p>(2) Future efforts</p> <ul style="list-style-type: none"> <li>• Promote the development of technologies to save the electric power used by telecommunications equipment and ACHV facilities with an aim to reduce electricity consumption in telecommunication networks as a whole. Promote research on high-speed high-capacity technologies and high-efficiency operation technologies for further energy savings</li> <li>• Promote the development of cloud technologies and high-efficiency technologies to feed power into telecommunications equipment with an aim to save energy at data centers and in telecommunications buildings</li> <li>• Enhance the promotion to spread solid oxide fuel cells</li> <li>• Contribute to the formulating the “best energy mix” by engaging in natural energy-based power generation, not limited to solar power but also including biomass and geothermal energy, for the stable supply of electric power</li> </ul>
Japan Franchise Association	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Installed freezers and refrigerators using CO2 as refrigerants in 63 stores, resulting in a total of 138 stores with such equipment</li> </ul>
The General Insurance Association of Japan	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Conducted collision experiments to study how tolerant vehicles were of shock and how easily they could be repaired and incorporated results in automobile insurance products (insurance premium discounts)</li> <li>• Acquired automobile insurance Eco-mark certification. Promoted insurance products and services leading to environmental conservation</li> </ul>
Japan LP Gas Association	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Supported the development of CCS (Carbon dioxide Capture and Storage) technologies by investing in a research firm specializing in CCS</li> </ul>
The Real Estate Companies Association of Japan	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Shared information on advanced practices with a wide audience and implemented advanced measures utilizing incentives. Promoted research on ZEB and ZEH as well as the practical use and dissemination of innovative technologies</li> <li>• Promoted efforts to encourage lifestyle shifts among residents and tenants by visualizing energy consumption</li> <li>• Considered real estate development for smart cities and low-carbon town building based on district heating and power interchange, the utilization of renewable and unharnessed energy, the introduction of AEMS (area energy management systems), addressing the heat island effect, and the establishment of a community transportation system</li> </ul>
Japan Building Owners and Managers	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Communicated the results of efforts and projects undertaken by member companies</li> </ul>

Association	<p>through lectures, newsletters and website. (Conducted the Low Carbon Society Promotion Campaign on February 6, 2014.)</p> <p>(2) Future efforts</p> <ul style="list-style-type: none"> <li>• Communicate the results of efforts and projects undertaken by member companies, including demonstration tests conducted under NEDO, through lectures, newsletters and website. (Will conduct the Low Carbon Society Promotion Campaign on January 29, 2015.)</li> </ul>
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#### 4. Transportation Sector

Industry	Examples of innovative technology development
The Japanese Shipowners' Association	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Cooperated with the shipbuilding / marine industry in developing innovative technologies including LNG-fueled ships</li> </ul>
The Scheduled Airlines Association of Japan	<p>(1) Performance in fiscal 2013</p> <ul style="list-style-type: none"> <li>• Continuously renewed aircrafts to new models in accordance with their development by aircraft manufacturers</li> <li>• Conducted pilot tests to operate aircrafts on next-generation bio-jet fuel</li> </ul> <p>(2) Future efforts</p> <ul style="list-style-type: none"> <li>• Continue to reduce CO2 emission intensity by renewing existing aircrafts to new models</li> </ul>
The Association of Japanese Private Railways	<p>(2) Future efforts</p> <ul style="list-style-type: none"> <li>• Introduce electric power storage equipment that can change the kinetic energy of a car into electric power and temporarily store it</li> </ul>

## Efforts made by participating industries beyond the four pillars

## 1. Industrial sector

Industry	Efforts made by participating industries beyond the four pillars
Japan Chemical Industry Association	<p>(1) Efforts to reduce emissions of non-CO2 GHGs</p> <ul style="list-style-type: none"> <li>• Achieved significant reductions in HFCs, PFCs, SF6s through a review of work processes, enhanced daily checkups, and the scheduled renewal of equipment. Will continue efforts to reduce emissions</li> </ul> <p>(2) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Solar power (22 companies), wind power (5 companies), biomass power (5 companies)</li> <li>• Geothermal power generation: commercially produced geothermal steam for sale to a geothermal power plant</li> </ul>
Japan Paper Association	<p>(1) Efforts to reduce non-CO2 emissions</p> <ul style="list-style-type: none"> <li>• Engaged in management and reduction efforts in accordance with corporate status</li> </ul> <p>(2) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Set up target to increase domestic and overseas afforestation area owned or managed by member companies by 525,000 ha from 1990 levels to 800,000ha. Planted a total of 626,000ha as of 2013</li> </ul> <p>(3) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Planned renovation of old plants to improve efficiency of hydroelectric generation equipment</li> </ul> <p>(4) Environmental management, environmental conservation activities in overseas business operation</p> <ul style="list-style-type: none"> <li>• Acquired ISO14001 certification at 96 business locations. Introduced an environmental management system meeting ISO14001 standards at one business location</li> </ul>
Japan Cement Association	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• As an industry, contributed the establishment of not only a low-carbon society but also a recycling-oriented society. Accepted waste and byproducts generated in other industries for utilization in cement production, thus saving natural resources and reducing environmental burden imposed by waste treatment. Contributed to extending the life of final disposal facilities</li> </ul> <p>(2) Efforts to reduce non-CO2 emissions</p> <ul style="list-style-type: none"> <li>• Destroyed fluorocarbons at some cement plants</li> </ul> <p>(3) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Some member companies conducted greening of remaining walls of limestone quarries, forest conservation activities in water source areas of water used at plants, acquired forest certification at company-owned forests, etc.</li> </ul> <p>(4) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Some member companies conducted solar power and biomass power generation</li> </ul> <p>(5) Environmental management, environmental conservation activities in overseas business operation</p> <ul style="list-style-type: none"> <li>• Acquired ISO14001 certification at all plants</li> </ul>
Liaison Group of Japanese Electrical and Electronics Industries for Global Warming Prevention	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• Best practices include recycling measures that reduce CO2 emissions by one-tenth compared to manufacturing material from raw materials</li> </ul> <p>(2) Efforts to reduce non-CO2 emissions</p> <ul style="list-style-type: none"> <li>• Promoted international inter-industry cooperation in the semiconductor and liquid crystal areas at the World Semiconductor Council (WSC) and the World LCD Industry Cooperation Committee (WLICC)</li> <li>• Achieved the target of controlling SF6 emissions “within 3% of net purchased volume of gas by 2005” through efforts to prevent leakage and improve recovery of electric insulation gas SF6 in accordance with JEMA’s voluntary action plan</li> </ul> <p>(3) Efforts to foster and conserve forest sinks</p>

	<ul style="list-style-type: none"> <li>• Conducted green space and Satoyama conservation and tropical forest restoration activities at domestic and overseas locations</li> <li>(4) Efforts to utilize renewable energy <ul style="list-style-type: none"> <li>• Improved the efficiency level of solar power generation (promoted the technological development of high conversion efficiency power conditioners for solar power systems, developed high-efficiency solar battery modules, developed solutions integrating solar power generation and power storage systems with an energy management system)</li> <li>• Improved the efficiency level of wind power (developed a new oil pressure drive train for offshore wind turbines, integrated monitoring and managing systems for wind turbines and storage batteries, liquid-cooled converters for large wind power systems)</li> <li>• Established model smart plants introducing megasolar power and fuel cells utilizing LNG</li> </ul> </li> <li>(5) Environmental management, environmental conservation activities in overseas business operations <ul style="list-style-type: none"> <li>• The industry has maintained a large share of all ISO14001-certified bodies in Japan. Has proactively acquired ISO14001 certification at overseas business locations and conducts environmental conservation activities similar to those conducted at domestic business locations</li> </ul> </li> </ul>
Japan Federation of Construction Contractors	<ul style="list-style-type: none"> <li>(1) 3Rs and global warming countermeasures <ul style="list-style-type: none"> <li>• Reduced and segregated waste generated in new construction projects (used precast concrete, reduced the generation of waste material by adopting alternative formwork, unitization of material)</li> <li>• Implemented measures to address construction surplus soil issues (proposed ways to reduce generation at the construction planning stage, considered the promotion of reuse at the construction site or in other construction projects, promoted the management and utilization of stock)</li> </ul> </li> <li>(2) Efforts to reduce non-CO2 emissions <ul style="list-style-type: none"> <li>• Used specialized companies to recover and destroy fluorocarbons</li> </ul> </li> <li>(3) Efforts to foster and conserve forest sinks <ul style="list-style-type: none"> <li>• Conducted afforestation and biodiversity conservation projects at branch offices and business locations of member companies</li> <li>• Proposed and implemented biodiversity conservation methods that consider achieving CO2 emission reductions at the planning stage or construction stage</li> </ul> </li> <li>(4) Efforts to utilize renewable energy <ul style="list-style-type: none"> <li>• Introduced solar, wind, and kitchen waste biomass power generation and biodiesel fuels at the construction stage</li> <li>• Promoted the use of natural energy, including solar and wind power, at the planning and operation stages. Promoted the employment of lighting and ventilation systems using sunlight and natural ventilation, and fuel cell cogeneration systems. Also promoted the interchanging of electricity among buildings and adopted a sprinkler system utilizing rainwater</li> </ul> </li> <li>(5) Environmental management, environmental conservation activities in overseas business operations <ul style="list-style-type: none"> <li>• Formulated the Construction Industry’s Voluntary Action Plan on the Environment 5<sup>th</sup> version (April 2013) and conducted follow-ups for each theme at the end of the fiscal year to pursue the PDCA cycle</li> <li>• Edited the “Environmental Laws Applicable to the Construction Industry in Fiscal 2013” and disclosed the checklist data</li> </ul> </li> </ul>
Japan Auto-Body Industries Association; Japan Auto Parts Industries Association	<ul style="list-style-type: none"> <li>(1) Efforts to reduce emissions of non-CO2 GHGs <ul style="list-style-type: none"> <li>• Operated a system for recovering and destroying fluorocarbons (CFC12、 HFC134a) and reduced HFC134a emissions</li> </ul> </li> <li>(2) Efforts to develop and conserve forest sinks <ul style="list-style-type: none"> <li>• Engaged in various domestic and overseas activities to foster and conserve forests</li> </ul> </li> <li>(3) Efforts to utilize renewable energy <ul style="list-style-type: none"> <li>• Introduced wind power, small hydropower, and solar power generation facilities</li> <li>• Utilized ground thermal energy to draw in outside air in air conditioning</li> </ul> </li> <li>(4) Environmental management, environmental conservation activities in overseas</li> </ul>

	<p>business operations</p> <ul style="list-style-type: none"> <li>• Companies have acquired and implemented ISO14001 to establish a more environment-friendly and efficient system. A similar trend is spreading among overseas locations</li> </ul>
Japan Federation of Housing Organizations	<p>(1) Efforts to reduce emissions of non-CO2 GHGs</p> <ul style="list-style-type: none"> <li>• Promoted the proper treatment of fluorocarbons</li> </ul> <p>(2) Efforts to develop and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Conducted forest management and planting and produced housing using local wood (local production for local consumption) to supply housing as part of a circular system of planting, fostering and conserving forests</li> </ul> <p>(3) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Improved the ratio of stand-alone houses with solar power generation facilities</li> <li>• Employed home energy management systems (HEMS) combining solar power generation facilities, fuel cells and storage cells in net-zero energy houses (NEH)</li> </ul> <p>(4) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• Conducted afforestation activities</li> </ul>
Japan Mining Industry Organization	<p>(1) 3R and climate change countermeasures</p> <ul style="list-style-type: none"> <li>• Promoted recycling, including recovery of various valuable and precious metals with a view to achieving zero-emission</li> <li>• Utilized waste fuel</li> </ul> <p>(2) Efforts to develop and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Managed corporate forests; restored and afforested old mining sites</li> </ul> <p>(3) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Promoted the construction of solar power generation facilities and planned the construction of hydropower construction facilities. At geothermal power plants, supplied steam to electric power companies and sold electricity. Developed new projects</li> </ul> <p>(4) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• Many member companies have acquired ISO14001. Contributed to environmental conservation by implementing overseas projects to recover precious metals and recycle household appliances</li> </ul>
Lime Manufacture Association	<p>(1) Efforts to reduce emissions of non-CO2 GHGs</p> <ul style="list-style-type: none"> <li>• Decomposed fluorocarbons in lime burning furnaces</li> </ul> <p>(2) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Installed solar panels</li> </ul> <p>(3) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• 8 member companies have acquired ISO14001</li> </ul>
The Japan Rubber Manufacturers Association	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• Used recycled rubber in-house, remanufactured waste rubber and defective products, and recycled waste plastics and paper to establish a sound material cycle</li> <li>• Converted waste rubber, waste tires and resins into fuel to establish a sound thermal cycle</li> <li>• Enhanced waste segregation to improve recycling status</li> </ul> <p>(2) Efforts to reduce emissions of non-CO2 GHGs</p> <ul style="list-style-type: none"> <li>• Prevented SF6 emissions and promoted the use of alternatives gases for PFC and SF6</li> </ul> <p>(3) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Planted trees and distributed seedlings</li> </ul> <p>(4) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Promoted the introduction of solar power generation at factories and logistics warehouses</li> </ul> <p>(5) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• Acquired ISO14001 certification (24 companies); announced efforts via websites (CO2 emissions (16 companies); conducted environmental management (18 companies))</li> </ul>



## (Attachment 6)

	<ul style="list-style-type: none"> <li>• Acquired ISO14001 certification at overseas business locations (11 companies), installed solar panels, etc.</li> </ul>
The Federation of Pharmaceutical Manufacturers' Associations of Japan	<p>(1) Efforts to reduce emissions of non-CO2 GHGs</p> <ul style="list-style-type: none"> <li>• Significantly reduced the use of HFCs in inhalation aerosols</li> </ul> <p>(2) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• 6 companies planted 2.8ha of forest. Furthermore, 7 companies fostered and conserved 138.3ha of forest by participating in forest development activities led by local governments</li> </ul> <p>(3) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Used renewable energy (1 million kWh at factories and 0.25 million kWh at research institution in fiscal 2013)</li> </ul> <p>(4) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• Many factories and research institutes are designated factories under the Energy Conservation Law. 9 companies have acquired certification for environmental management systems for offices</li> </ul>
Flat Glass Manufacturers Association of Japan	<p>(1) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Proactively used paper manufactured from forest thinnings</li> <li>• Replaced wooden boxes for product delivery from overseas factories with returnable steel pallets in order to support tropical forest conservation</li> </ul> <p>(2) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Some member companies use only renewable energy in their main office buildings</li> <li>• Some manufacturing plants operate on solar power</li> </ul> <p>(3) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• Overseas affiliates conducted environmental conservation activities, including planting trees in tropical forests and mangrove forests, and stocking rivers with young fish</li> </ul>
Japan Federation of Printing Industries	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• Distributed booklet "Good practices for improving the 3Rs"; promoted CO2 emissions reductions in raw materials and transport</li> <li>• Utilized waste heat from deodorization equipment; reviewed rate return for waste</li> </ul> <p>(2) Efforts to reduce emissions of non-CO2 GHGs</p> <ul style="list-style-type: none"> <li>• Continued checkups for HFC and PFC gas leaks and maintenance. Properly treated gases no longer required pursuant to relevant laws</li> <li>• Continued checkups for dielectric gas SF6 gas leaks and maintenance</li> </ul> <p>(3) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Continued domestic and overseas forest planting and conservation activities</li> <li>• Proactively used FSC and PEFC-certified paper for printing</li> <li>• Facilitated paper recycling by review the "recycling suitability ratings for used paper"</li> </ul> <p>(4) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Promoted the introduction of solar power generating systems and heat pumps at printing factories</li> </ul> <p>(5) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• Established the "green standards" for offset printing services to promote CO2 emission reduction. Encouraged the participation of small-sized enterprises</li> </ul>
Japan Aluminium Association	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• Continued to promote the recycling of aluminum cans which lead to significant reductions in CO2 emissions (CO2 emissions from new aluminum material is 9,218kg-CO2/t, whereas emissions from recycled aluminum material is 309kg-CO2/t)</li> </ul> <p>(2) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Engaged in efforts to conserve green spaces</li> </ul> <p>(3) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• Acquired ISO14001 certification at all 15 offices of the 10 participating companies. Proactively engaged in environmental conservation activities in overseas business operations</li> </ul>

Brewers Association of Japan	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• Continued to recycle 100% of byproducts and waste generated at factories</li> <li>• Used returnable bottles</li> <li>• Considered LCA in product development (lightweight bottles, cans with a smaller radius, lightweight cardboard)</li> <li>• Used cans with smaller environmental burden at the manufacturing stage</li> </ul> <p>(2) Efforts to reduce emissions of non-CO2 GHGs</p> <ul style="list-style-type: none"> <li>• Operated on non-fluorocarbon refrigerants (at 2 plants)</li> <li>• Renewed equipment to ammonia refrigerating systems</li> </ul> <p>(3) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Cooperated with the national and local governments to recharge water in 17 locations covering a nationwide total of 7600ha (as of April 2013). Plans to expand water recharge area to 12,000ha by 2020</li> <li>• Conducted CO2 absorption activities, including forest management in corporate forests</li> </ul> <p>(4) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Utilized methane gas from biomass at plants, introduced solar power generation, installed small hydropower systems</li> <li>• Placed “green energy” labels on main products and continued efforts to raise public awareness regarding renewable energy</li> <li>• Utilized green electricity at main office buildings</li> </ul> <p>(5) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• [Domestic operations] Integrated environmental management systems individually installed at plants and expanded to group affiliates</li> <li>• [Overseas operations] Installing environmental management systems at a larger number of overseas manufacturing locations</li> </ul>
The Japanese Electric Wire & Cable Makers' Association	<p>(1) Efforts to reduce emissions of non-CO2 GHGs</p> <ul style="list-style-type: none"> <li>• Prevented the leakage and promoted the recovery and reuse of SF6 and HFC in equipment maintenance checkups and repairs</li> </ul> <p>(2) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• Acquired ISO14001 certification at 75 companies</li> <li>• Posted a summary of the industry's Voluntary Action Plan on the Environment in an effort to communicate activities to a wider audience</li> <li>• Collected and announced corporate efforts to improve energy efficiency and shared best practices across the industry; engaged in efforts to further measures</li> </ul>
Japan Dairy Industry Association	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• Developed more lightweight and thinner containers for drinks, yogurt and cheese products to “reduce” waste</li> <li>• Collected and “reused” milk bottles 60 times and more</li> <li>• Promoted milk cartons recycling, manufactured and sold products in carbon-neutral paper cartons, segregated and recycled emissions and waste from manufacturing processes</li> </ul> <p>(2) Efforts to reduce non-CO2 emissions</p> <ul style="list-style-type: none"> <li>• Renewed and properly managed equipment operating on fluorocarbons</li> <li>• Considered the adoption of freezers using natural refrigerants</li> <li>• Prevented fluorocarbon leakages and shifted to natural refrigerants with lower GWPs</li> </ul> <p>(3) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Conducted water recharging activities in water source forests around plants</li> <li>• Planted trees</li> </ul> <p>(4) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Installed solar power systems</li> </ul> <p>(5) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• Promoted environment-friendly corporate management by acquiring ISO14001 and Eco-Action21 certification and conducting efficient management under such systems</li> </ul>

Japan Copper and Brass Association	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• Reduced the use of electric copper and promoted the use of recycled copper to contribute to the reduction of energy consumption in the copper refining process from a LCAA perspective</li> <li>• Reduced CO2 emissions by manufacturing thinner copper sheets, and thus reducing production volume</li> <li>• Increased the use of recycled copper to reduce energy consumption in the copper refining process</li> </ul> <p>(2) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Promoted greening at all business locations</li> </ul> <p>(3) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Installed solar power systems</li> </ul> <p>(4) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• Conducted overseas environmental conservation activities based on domestic environmental management systems</li> </ul>
The Japan Society of Industrial Machinery Manufacturers	<p>(1) Efforts to reduce emissions of non-CO2 GHGs</p> <ul style="list-style-type: none"> <li>• Thoroughly managed the use of fluorocarbon alternatives and proper recovery and disposal of fluorocarbons</li> <li>• Used natural refrigerants (ammonia, CO2, water, air, hydrocarbons)</li> <li>• Refrained from using ozone-depleting substances (HCFC-141B, HCFC-225)</li> <li>• Installed high-efficiency gas turbine combined cycles at steel plants</li> <li>• Developed large marine diesel engines that will meet Tier 3 NOx standards under development by the IMO</li> </ul> <p>(2) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Participated in forest conservation activities and tree-planting activities</li> <li>• Used paper made from tree thinnings</li> <li>• Engaged mangrove afforestation activities (Thailand)</li> </ul> <p>(3) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Installed solar and wind power systems</li> <li>• Designed and constructed boilers for biomass power systems</li> <li>• Manufactured small hydropower and geothermal power equipment</li> <li>• Participated in METI's Floating Offshore Wind Turbine Demonstration Project</li> </ul>
The Japan Bearing Industrial Association	<p>(1) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Engages in reforestation with local government in mountains located near plants</li> </ul> <p>(2) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Installed solar and wind power systems, as well as developed electricity control technologies that effectively utilize renewable energy in a natural energy management demonstration project</li> </ul> <p>(3) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• Acquired ISO14001 certification in 101 domestic and 107 overseas business locations</li> </ul>
Japan Sanitary Equipment Industry Association	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• Set up corporate targets for waste volume and recycling rates and implemented measures to achieve them</li> </ul> <p>(2) Efforts to reduce non-CO2 emissions</p> <ul style="list-style-type: none"> <li>• Replaced 5.5 gases with fluorocarbon alternatives and non-fluorocarbon gases</li> <li>• Promoted the use of high-efficiency gases in gas heat pumps and kilns. Initiated measurements of methane and N2O emitted during incineration</li> </ul> <p>(3) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Planted oak seedlings in 26 locations nationwide and cleared underbush</li> <li>• Conducted other forest conservation activities</li> </ul> <p>(4) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Introduced solar power and other renewable energy equipment at plants</li> </ul> <p>(5) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• Aims to reduce CO2 emissions by 30% relative to 2008 levels in 2017 among the 2600</li> </ul>

	<p>corporate vehicles through replacement with environment-friendly vehicles and implementation of environment-friendly driving practices</p> <ul style="list-style-type: none"> <li>• Collaborate with local stakeholders in each country / region to environmentally resolve social and local issues (e.g. support the development of safe drinking water supply systems)</li> </ul>
Japan Soft Drink Association	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• Reduced energy consumption in transporting products by developing more lightweight PET bottles and increasing the in-house production rate</li> <li>• Reduced environmental burden by implementing bottle-to-bottle recycling of PET bottles</li> <li>• Used returnable glass bottles and maintained the reuse system</li> <li>• Reduced fuel consumption in boilers by recovering and using heat from waste hot water</li> <li>• Recovered and used waste water</li> <li>• Reduced transport and fuel consumption by reducing waste</li> <li>• Promoted the effective use of resources by making compost from waste (tea leaves and coffee grounds)</li> <li>• Used methane gas produced by fermenting used tea leaves to heat boilers</li> </ul> <p>(2) Efforts to reduce non-CO2 emissions</p> <ul style="list-style-type: none"> <li>• Adopted ammonia freezers and maintained stable operations</li> <li>• Continued the deployment of non-fluorocarbon heat-pump vending machines</li> <li>• Properly recovered and destroyed fluorocarbons from vending machines</li> </ul> <p>(3) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Collaborated with the national and local governments in water recharge activities</li> <li>• Acquired forest certification in corporate forests and conducted proper forest and mountain management</li> <li>• Implemented tree-planting activities</li> </ul> <p>(4) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Introduced solar power systems at manufacturing plants</li> <li>• Installed solar powered lights and solar powered emergency lights</li> <li>• Stored snow for use in air conditioning and production processes</li> </ul>
Limestone Association of Japan	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• The Environment Subcommittee visited a household appliances recycling plant</li> </ul> <p>(2) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Conducted greening of limestone quarry walls and piling area</li> <li>• Promoted afforestation activities and cultivated and preserved rare plants</li> <li>• Installed green curtains on the rooftops to prevent office temperatures from rising and to promote greening</li> </ul> <p>(3) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Conducted megasolar power generation</li> </ul> <p>(4) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• Acquired ISO14001 certification at 13 quarries. Implemented an energy-saving PDCA cycle in pursuit of energy efficiency improvements</li> </ul>
Japan Machine Tool Builders' Association	<p>(1) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• An increasing number of companies installed solar panels</li> </ul>
Flour Millers Association	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• Promoted higher efficiency in logistics by shifting to lorry transport from product packaging and utilizing train and ship transport</li> </ul>
The Shipbuilders' Association of Japan / The Cooperative Association of Japan Shipbuilders	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• Reduced the amount of waste generated and the energy required in waste treatment</li> </ul> <p>(2) Efforts to reduce non-CO2 emissions</p> <ul style="list-style-type: none"> <li>• Recovered and destroyed fluorocarbons in accordance with laws</li> </ul> <p>(3) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Introduced solar power generation equipment</li> </ul> <p>(4) Environmental management, environmental conservation activities in overseas</p>

	<p>business operations</p> <ul style="list-style-type: none"> <li>• Many companies have established environmental conservation sections and have acquired ISO14001 certification and are individually implementing corporate activities to save energy and waste</li> </ul>
Japan Industrial Vehicle Association	<p>(1) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Utilized solar power at plants</li> </ul> <p>(2) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• An increased number of companies have acquired ISO14001 certification at overseas plants. All domestic plants of participating companies have acquired ISO14001 certification</li> </ul>
Japan Association of Rolling Stock Industries	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• Promoted the survey and consideration of alternatives for existing paints, solvents and adhesives for the reduction of chemical substance use. Engaged in efforts to reduce the discharge of substances of concern by improving operations, including shortening the time required for painting</li> <li>• Regularly conducted monitoring and measurements in order to prevent the leakage of fluorocarbons used in exposure tests</li> <li>• Recovered refrigerants (PFVs, HFCs) and promoted a shift to non-fluorocarbon gases</li> <li>• Engages in efforts to increase the recovery efficiency of SF6 used in electricity system equipment</li> </ul> <p>(2) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Conducted silviculture, Satoyama conservation and biodiversity conservation activities nationwide</li> <li>• Increased green spaces on factory premises</li> </ul> <p>(3) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Proactively introduced solar power generation equipment</li> </ul> <p>(4) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• Acquired EA21 environmental management system certification, based on which annual action plans and education and training programs were formulated, and factory employees implemented actions under them. Prepared for the acquisition of ISO14001 certification</li> <li>• Acquired ISO14001 certification and is continuously engaged in efforts to save energy by employing an energy management system, reduce waste and replace toxic substances (lead, chrome, cadmium and mercury)</li> </ul>
Japan Petroleum Development Association	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• Promoted the recycling of waste (steel pipes, waste oil and scrap metals) generated during business operations</li> </ul> <p>(2) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Promoted afforestation activities (UAE, Indonesia, Australia, Niigata Prefecture)</li> </ul> <p>(3) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Constructed a solar power plant</li> </ul> <p>(4) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• Conducted business operations utilizing an HSE (Health, Safety and Environment) management system</li> <li>• Implemented various measures in overseas oil and natural gas development projects in accordance with strict local environmental standards (including the introduction of ecosystem-friendly production methods with little environmental burden)</li> </ul>

## 2. Energy conversion sector

Industry	Efforts made by participating industries beyond the four pillars
The Federation of Electric Power Companies	<p>(1) Efforts to reduce non-CO2 emissions</p> <ul style="list-style-type: none"> <li>• Formulated the Voluntary Action Plan for the Reduction of SF6 Emissions from Electric Power Business (April 1998) to reduce emission and recycle SF6 used in gas</li> </ul>

	<p>insulation equipment, etc.</p> <ul style="list-style-type: none"> <li>• Engaged in efforts to reduce HFC emissions by preventing its leakage during the installation and maintenance of equipment as well as by recovering and reusing HFCs, which are used as refrigerants in air conditioning equipment</li> <li>• Estimated N<sub>2</sub>O emissions from fuel combustion at thermal power plants to be 3% of total N<sub>2</sub>O emissions in Japan. Made every effort to reduce emissions by improving power generation efficiency</li> </ul> <p>(2) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Managed corporate mountain forests, water source forests, and green spaces on power plant premises and continued to cooperate in afforestation and forest management activities in various locations</li> <li>• Conducted demonstration tests of mixed combustion of wood biomass in coal-fired thermal power plants utilizing unused domestic forest resources (timber harvest residues), used paper made from tree thinnings for environmental reports, business cards, fans, boardwalk, etc., and utilized driftwood</li> </ul> <p>(3) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Electric power operators developed hydropower, geothermal, solar, wind and biomass power generation systems</li> <li>• Engaged in efforts to develop and disseminate renewable energy by connecting electricity from solar and wind power generation facilities to the grid under the feed-in-tariff program</li> <li>• Engaged in efforts to develop and introduce new grid control system to connect large solar and wind power facilities, whose output fluctuates largely depending on the weather</li> </ul> <p>(5) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• Improved in-house environmental management systems in accordance with the purpose of the ISO14000 series, acquired ISO14001 certification at major business locations</li> <li>• Introduced environmental accounting and environmental auditing</li> <li>• Accepted trainees from mainly developing countries and dispatched expert engineers from Japan to provide technological guidance and transfer</li> </ul>
Petroleum Association of Japan	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• Continued efforts to reduce waste generated in business operations and set up the industry-specific “zero emission of industrial waste” target</li> </ul> <p>(2) Efforts to reduce non-CO<sub>2</sub> emissions</p> <ul style="list-style-type: none"> <li>• Engaged in efforts to reduce N<sub>2</sub>O emissions by improving combustion efficiency</li> </ul> <p>(3) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Engaged in domestic forest conservation activities with local governments</li> <li>• Engaged in tropical forest conservation projects and the Silk Road greening project overseas</li> </ul> <p>(4) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• The petroleum industry achieved the voluntary target set up in accordance with government requests to introduce 210,000kl of oil equivalent biofuel by fiscal 2010. The industry is now striving to introduce 500,000kl of oil equivalent biofuel by fiscal 2017 pursuant to Sophisticated Methods of Energy Supply Structures</li> </ul> <p>(5) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• All oil refineries have acquired ISO14001 certification or have established similar environment management systems of the same standards. Affiliates have also proactively introduced EMS as a part of company-wide or group-wide environmental efforts</li> <li>• Conducted environment-friendly crude oil production in accordance with the “zero-flare project” (a project that returns the oil gas generated in oil fields to underground oil deposits) in oil field operations in UAE</li> </ul>
The Japan Gas Association	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• Recycled polyethylene tube waste, recycled and reused gas meters, reduced generation of and recycled excavated soils and asphalt concrete piles</li> </ul> <p>(2) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Engaged in various afforestation and tree-planting activities</li> </ul>

	<p>(3) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Introduced a solar power system in a newly built showroom, visualized the status of power generation and usage, and provided customers with relevant information</li> <li>• Operated wind power generation equipment on plant premises</li> <li>• Received biogas made from food residue for injection into city gas pipes</li> <li>• Sold various products utilizing solar power generation</li> </ul> <p>(4) Environmental management, environmental conservation activities in overseas business operation</p> <ul style="list-style-type: none"> <li>• In 1994, formulated the Environmental Action Guidelines, which included voluntary corporate efforts to reduce CO2 emissions and disseminating natural gas, which emits the least CO2 of all fossil fuels. The production sector operated environmental management systems developed according to corporate standards and promoted energy savings and environmental burden reduction</li> <li>• Supported mainly small and medium-sized enterprises in introducing ISO14001 and formulating environmental reports to improve the gas industry as a whole</li> <li>• Supports a tropical forest restoration project in Malaysia since April 2010</li> </ul>
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### 3. Commercial and other sectors

Industry	Efforts made by participating industries beyond the four pillars
Japan Association of Refrigerated Warehouses	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• 85% of freezing equipment across the industry use fluorocarbon refrigerants including HCFC and HPC, and therefore took all possible measures to prevent leakage of refrigerants during operation and maintenance</li> </ul> <p>(2) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• Encouraged member companies to acquire MLIT's Green Management certification for business management contributing to environmental conservation; conducted energy management and effective energy use</li> </ul>
Japan Franchise Association	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• Promoted the recycling of food residue into fertilizer and compost</li> </ul> <p>(2) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Promoted the introduction of natural energy sources including solar power</li> </ul>
Japan LP Gas Association	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• Fully segregated waste, used the backside of printed copy paper, collected PET bottle caps</li> </ul> <p>(2) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Conducted forest and Satoyama conservation activities nationwide, including collaboration with local governments</li> <li>• Promoted the planting of trees and other plants on factory premises and main office buildings</li> <li>• Conducted mangrove planting in the Philippines</li> </ul> <p>(3) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Introduced solar power</li> <li>• Promoted dissemination of solar power generation system by selling them</li> </ul> <p>(4) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• Acquired ISO14000 and ISO14001 certification</li> </ul>
The Real Estate Companies Association of Japan	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• Set up targets to improve the utilization rate of recycled paper in office paper and the rate green procurement, promoted the 3Rs and reduced energy consumption</li> <li>• Reduced the waste generated in the construction and demolishing of a new office building or condominiums and reduced the energy consumed in waste treatment</li> </ul> <p>(2) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Promoted greening and conducted periodical conservation activities</li> </ul>

	<ul style="list-style-type: none"> <li>• Planted local tree species</li> <li>• Conducted conservation activities in corporate forests</li> <li>• Promoted the use of products with natural environment and biodiversity-related certification or appraisal</li> </ul> <p>(3) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Adopted daylighting and natural ventilation technologies</li> <li>• Introduced solar power generation and solar power systems</li> <li>• Used rainwater and groundwater with recycled water</li> </ul> <p>(4) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• 31 companies formulated environmental reports. 6 companies are considering the compilation of environmental reports</li> <li>• 22 companies acquired ISO14001 certification</li> <li>• 18 companies conducted and disclosed environmental accounting. 4 companies are considering the introduction of environmental accounting</li> <li>• 43 companies have established sections mainly addressing environmental measures. 1 company is considering the establishment of a section specializing in environmental measures</li> <li>• 51 companies implemented environment-friendly activities</li> <li>• Implemented afforestation activities and periodical conservation activities overseas</li> </ul>
The Life Insurance Association of Japan	<p>(1) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Engaged in efforts to reduce the amount of paper used. 11 companies engaged in afforestation and tree-planting activities. Also provided support to environmental conservation organizations</li> </ul> <p>(2) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• Formulated the Action Guidelines for Environmental Issues and the Life Insurance Association's Commitment to a Low Carbon Society and promoted measures to address environmental issues based on these compilations</li> <li>• 4 companies acquired ISO14001 certification and 3 companies are currently considering acquisition</li> </ul>
The General Insurance Association of Japan	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• Recycled paper, cans and PET bottles</li> </ul> <p>(2) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• In Japan, concluded agreements on forest management with local government and engaged in forest management and environmental education activities with employees, insurance agents, their families and local customers</li> <li>• Planted mangrove forests in 9 countries, including in Southeast Asia and engaged in efforts to restore tropical forests in Indonesia</li> </ul> <p>(3) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Introduced solar power and biomass power systems</li> <li>• Promoted the purchase of green electricity generated using wind and biomass power</li> </ul> <p>(4) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• Formulated an environmental action plan, based on which member companies promoted environmental activities. Established a special committee on environmental issues to survey and announce corporate efforts and improve efforts across the industry</li> <li>• 17 companies have corporate management policies regarding environmental issues and 8 companies have acquired ISO14001 certification</li> </ul>
Telecommunications Carriers Association	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• [reduce] Promoted the reduction of paper use by introducing internet-based billing services</li> <li>• [reuse] Reused resources by promoting the reuse of business equipment and trade-ins of cell phones</li> <li>• [recycle] Promoted the recycling of telecommunication equipment. With the cooperation of relevant companies, launched the Mobile Recycle Network to collect used cell phones, PHS phones, batteries and storage batteries via approximately 10000 shops nationwide specializing in cell phones. Recovered precious metals for reuse in electronics</li> </ul>



	<p>parts</p> <p>(2) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Promoted afforestation and tree-planting activities at various locations</li> </ul> <p>(3) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Promoted the introduction of power generation systems using solar power and other natural energy sources</li> <li>• Some member companies are engaged in commercial solar power projects</li> </ul> <p>(4) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• Acquired ISO14001 certification and saved electric power at telecommunication facilities</li> <li>• Optimized preset temperatures of air conditioning equipment at facilities. Proactively adopted “top-runner” energy-saving equipment</li> </ul>
Japan Foreign Trade Council, Inc.	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• Conducted recycling business operations for metals, household appliances, beverage containers, hybrid batteries, fluorocarbons, office paper, etc.</li> <li>• Conducted commercial waste incineration for power generation and industrial waste treatment and gas manufacture operations</li> </ul> <p>(2) Efforts to reduce non-CO2 emissions</p> <ul style="list-style-type: none"> <li>• Conducted commercial recycling of fluorocarbon refrigerant gases</li> </ul> <p>(3) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Implemented various activities including afforestation and silvicultural activities in corporate forest nationwide</li> <li>• Conducted tropical forest reforestation and ecosystem conservation activities overseas</li> <li>• Imported and sold environment-friendly products</li> </ul> <p>(4) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Launched various commercial power generation operations using solar power, wind power, hydropower, geothermal power, and biomass, in Japan and overseas</li> </ul> <p>(5) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• Acquired ISO14001 certification in 25 companies. Promoted the acquisition of ISO14001 certification at overseas business locations</li> </ul>
Japanese Bankers Association	<p>(1) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• 70 banks engaged in forest conservation and developing activities, including tree-planting, tree thinning and clearing underbrush</li> </ul> <p>(2) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• 68 banks engaged in efforts to utilize renewable energy. 67 banks installed solar power systems and 9 banks installed wind power systems</li> </ul> <p>(3) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• 22 banks acquired ISO14001 certification, 56 banks issued environmental reports and 96 banks communicated corporate environmental activities on their websites</li> </ul>

#### 4. Transportation Sector

Industry	Efforts made by participating industries beyond the four pillars
The Scheduled Airlines Association of Japan	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• Adopted recycled material for uniforms worn by flight crew, cabin attendants and ground agents. Recycled used uniforms into automobile parts, etc.</li> <li>• Conducted nearly 100% recycling of aircraft material and parts when aircrafts would not be sold</li> </ul> <p>(2) Efforts to reduce emissions of non-CO2 GHGs</p> <ul style="list-style-type: none"> <li>• Controlled emissions by preventing leakage, recovering and reusing fluorocarbon alternatives upon the maintenance and repair of equipment operating on fluorocarbon alternatives (Achieved a recovery rate of nearly 100%)</li> </ul> <p>(3) Efforts to foster and conserve forest sinks</p>

	<ul style="list-style-type: none"> <li>• Conducted afforestation activities around airports</li> </ul> <p>(4) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Used solar power for some of the electricity consumed at business locations</li> </ul> <p>(5) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• Developed continuous CO2 measurement equipment (CME) through collaboration among industry, academia and government and installed CME in aircrafts to measure various CO2 concentration data along flight routes</li> <li>• Flight crews provided information on discovery of forest fires in Siberia, Alaska and Indonesia</li> </ul>
The Japanese Shipowners' Association	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• Will adopt refrigerants with less global warming impact as they are developed to replace fluorocarbon alternatives including HFCs (used in air conditioning equipment, food storage, reefer containers) and makes efforts not to emit such gases into the air during maintenance and repairs</li> </ul> <p>(2) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Contributes to forest development projects through donations to nature conversation funds</li> </ul> <p>(3) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• Engages in continued efforts to reduce environmental burden by establishing ISO14001 environmental management systems, etc.</li> </ul>
Japan Federation of Coastal Shipping Associations	<p>(1) Efforts to reduce emissions of non-CO2 GHGs</p> <ul style="list-style-type: none"> <li>• As fluorocarbon alternatives are used in air conditioning equipment and freezers on ships, engaged in efforts to adopt refrigerants with smaller global warming impact and to prevent leakage of refrigerants</li> <li>• Complied with domestic laws adopted based on IMO provisions</li> </ul> <p>(2) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• As the acquisition of the ISO14000 series is difficult among member micro-enterprises, individually promoted corporate measures in accordance with corporate rules, including the adoption and reporting of energy-saving plans and targets based on the revised Energy Saving Act</li> </ul>
The Association of Japanese Private Railways	<p>(1) 3Rs and global warming countermeasures</p> <ul style="list-style-type: none"> <li>• Engaged in various 3Rs-based activities, including recycling used train tickets, transferring train cars no longer used by major private railway companies to rural railways, adopting uniforms made from recycled material</li> </ul> <p>(2) Efforts to reduce emissions of non-CO2 GHGs</p> <ul style="list-style-type: none"> <li>• Replaced train car control equipment and air conditioning equipment using fluorocarbons as refrigerants with new equipment using water-based heat pipes upon the introduction of new train cars models. Also renewed equipment used in existing trains</li> <li>• Promoted the adoption of heat pipes not using GHGs in cooling equipment for electric devices at substations</li> </ul> <p>(3) Efforts to foster and conserve forest sinks</p> <ul style="list-style-type: none"> <li>• Promoted Satoyama conservation and afforestation by cooperating with local governments to manage company-owned Satoyama and conduct tree thinning operations, as well as participating in tree planting activities along railway lines</li> <li>• Promoted greening activities including covering the outer walls of stations and track grades with vegetation and trees not only for environmental conservation but for beautification</li> </ul> <p>(4) Efforts to utilize renewable energy</p> <ul style="list-style-type: none"> <li>• Promoted the installation of power generation systems using solar power and other natural energy sources</li> </ul> <p>(5) Environmental management, environmental conservation activities in overseas business operations</p> <ul style="list-style-type: none"> <li>• Acquired ISO14001 certification in many construction departments including factories conducting regular checkups of train cars and in other operations. Some member</li> </ul>

	companies have acquired ISO14001 certification in not only their railway section but also for all other business operations
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**Results of Efforts Related to Commercial Sector (Offices etc.)**

Industry	Energy consumption volume per unit of floor area [crude oil equivalent l/m <sup>2</sup> ]			Target
	FY2012	FY2013	Over the previous year's	
The Japan Iron and Steel Federation	29.9	28.9	-3.2%	-
Japan Paper Association	23.7	24.0	+1.5%	-
Lime Manufacture Association	26.4	25.2	-4.7%	-
The Federation of Pharmaceutical Manufacturers' Associations of Japan	33.0	34.2	+3.7%	-
Japan Aluminum Association	24.8	24.4	-20.1%	-
Japan Soft Drink Association	38.2	37.5	-1.8%	-
Japan Dairy Industry Association	52.6	50.2	-4.5%	-
The Japanese Electric Wire&Cable Makers' Association	29.4	27.6	-6.1%	-
The Japan Bearing Industrial Association	66.8	64.8	-2.9%	-
The Japan Society of Industrial Machinery Manufacturers	27.1	24.5	-9.9%	-
Japan Petroleum Development Association	36.3	38.2	+5.1%	-
Japan Copper and Brass Association	23.8	23.6	-0.7%	-
The Shipbuilders' Association of Japan and the Cooperative Association of Japan Shipbuilders	51.3	32.8	-36.0%	-
Limestone Association of Japan	34.4	33.4	-2.9%	-
Flour Millers Association	30.0	30.1	+0.6%	-
Japan Association of Rolling Stock Industries	30.6	29.4	-4.1%	-
The Japan Gas Association	45.9	44.4	-3.2%	-
The Life Insurance Association of Japan	39.1	36.6	-6.4%	At 1 % per annual rate, in comparison with the year 2009
The General Insurance Association of Japan	28.9	28.3	-2.2%	At 1 % per annual rate, in comparison with the year 2009
The Association of Japanese Private Railways	40.4	37.0	-8.5%	-

### Results of Efforts Related to Transportation Sector

Industry	Energy consumption volume per unit of traffic volume [crude oil equivalent l/t-km]		
	FY2012	FY2013	Over the previous year's
The Japan Iron and Steel Federation	0.0168	0.0167	-0.6%
Japan Paper Association	0.0202	0.0201	-0.5%
Japan Automobile Manufacturers Association, Inc. / Japan Auto-Body Industries Association, Inc.	0.0376	0.0378	+0.6%
Japan Soft Drink Association	0.016	0.011	-30.4%
Japan Dairy Industry Association	0.038	0.037	-1.9%
Japan Copper and Brass Association	0.059	0.052	-11.8%
Limestone Association of Japan	0.0149	0.0150	+0.3%

**Members of the Evaluation Committee for  
Keidanren's Commitment to a Low carbon Society**

December 16, 2014

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