Keidanren
Policy & Action

# Keidanren Carbon Neutrality Action Plan

－Vision toward Carbon Neutrality by 2050
and Fiscal 2021 Follow-up Results
(Performance in Fiscal 2020)－

［Final Version］

(Provisional Translation)

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KEIDANREN
(Japan Business Federation)

# Table of Contents

# Introduction

Keidanren has run the PDCA cycle every fiscal year, promoting voluntary and proactive approaches by industries and companies, since it formulated the "Keidanren Voluntary Action Plan on the Environment" in June 1997, ahead of the adoption of the Kyoto Protocol in December 1997. As a result, it successfully reduced average emissions during fiscal 2008-2012, that was the first commitment period of the Kyoto Protocol, by 12.1% relative to fiscal 1990 levels, substantially overachieving the initial target. Later in 2013, it expanded on the "Keidanren Voluntary Action Plan on the Environment" and formulated the "Keidanren's Commitment to a Low Carbon Society" (hereinafter "Commitment"), under the four pillars of which the Japanese business community has engaged in measures toward achieving a low carbon society. These measures have been considered to constitute a pillar of the Japanese business community's efforts under the Government's plans, including the "Plan for Global Warming Countermeasures".

In October 2021, the Government announced its target to achieve carbon neutrality (CN) by 2050, followed by its announcement in April 2022 of its target to reduce greenhouse gas emissions by 46% in fiscal 2030. These ambitious goals can only be achieved through the fully committed efforts of both public and private sectors. It is important to let these efforts lead to Japan's economic growth, creating a virtuous cycle of economy and environment. The business community is determined to work with the Government with unwavering resolve.

The Commitment laid emphasis on $CO_2$ reductions toward 2030 with a view to contributing to Japan's mid-term reduction target under the Paris Agreement. Given increasing concerns and expectations in Japan and overseas regarding the achievement of CN by 2050, Keidanren decided to newly position the achievement of CN as its most important goal. Hence, it has renewed the Commitment as the "Keidanren Carbon Neutrality Action Plan" (hereinafter "CN Action Plan") and will strongly promote it as provided below:

(1) Formulation of visions and development and introduction of innovative technologies toward CN by 2050: Formulate the visions (basic policy, etc.) toward CN by 2050 and advance the development of the innovative technologies required for their achievement with multiple options.

(2) Emissions reductions from domestic business operations: Contribute to achieving Japan's FY2030 target by constantly reviewing the 2030 targets, which were set up under the Commitment to a Low Carbon Society, while steadily advancing reduction efforts through the maximized deployment of BAT (best available

technologies) toward 2030 and seeking further technology development and deployment.

(3) Strengthening co-operation with other interested groups and promoting contribution at the international level: Contribute to the transition toward CN and to the achievement of CN by 2050 at the global level through not only reducing $CO_2$ emissions from one's own business operations, but also taking measures at the use (utilization) phase of products and services and across the entire supply chain, and overseas technology transfer.

By strongly promoting the CN Action Plan with the engagement of the Government and citizens, Keidanren will maximize its efforts toward achieving CN by 2050.

## Part 1　Vision toward Carbon Neutrality by 2050 (Basic Policy, etc.)

### 1. Status of development of a Vision toward CN by 2050 (basic policy, etc.)

Part 1 will report on the status of formulating a Vision toward CN by 2050 (basic policy, etc.).

As the world's concerns and expectations become increasingly focused on CN by 2050, the business community is also required to present its vision toward the achievement of CN by 2050 domestically and overseas.

All 62 participating industries were asked about the progress made in formulating a Vision toward CN by 2050. All responding industries reported that they had either already formulated a Vision, were considering one, or intended to consider one. No industries responded that they had no plan to consider a Vision (Figure 1). The $CO_2$ emissions from the 27 industries that have already formulated visions collectively amount to nearly 90 percent of total emissions from all participating industries (Figure 2).

**Figure 1. Status of Vision formulation in 62 participating industries (number of industries)**

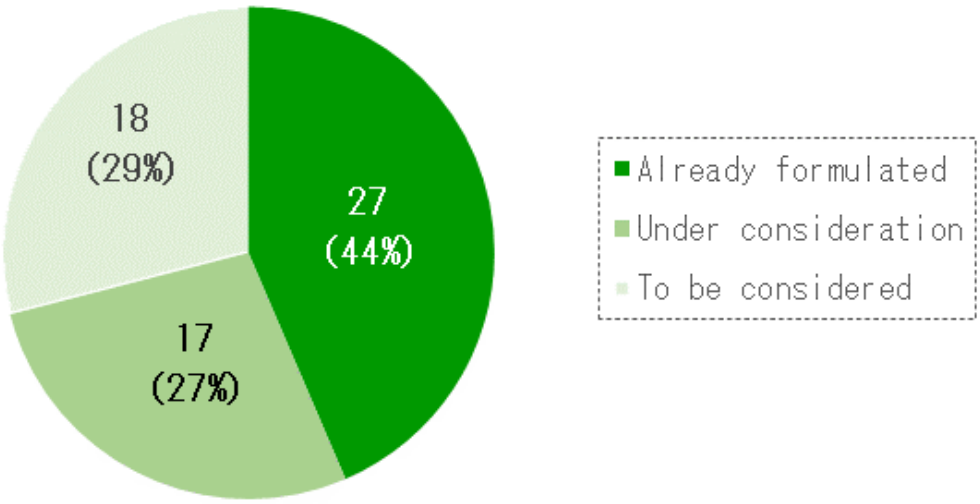
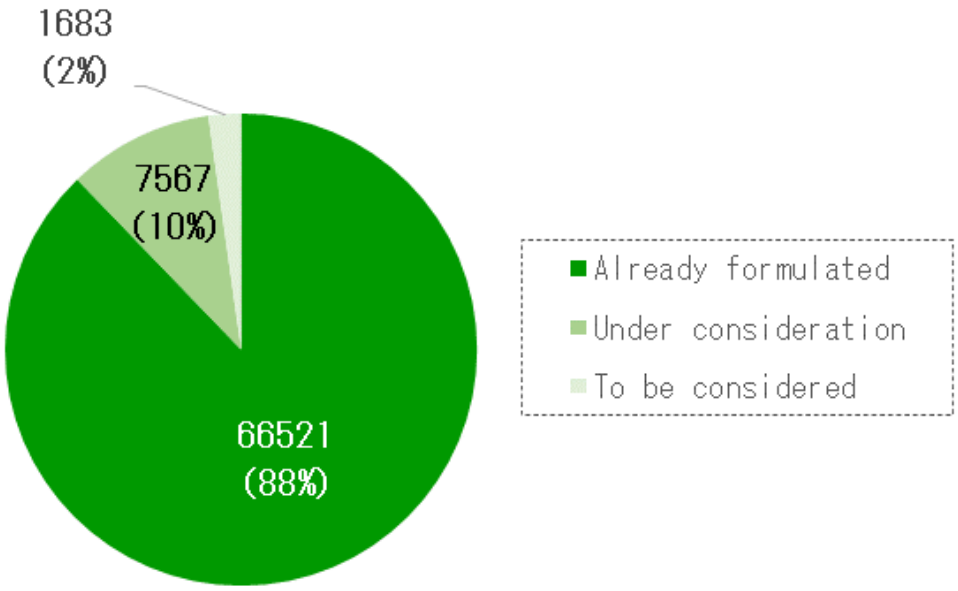


**Figure 2. Status of Vision formulation (in terms of emissions, 10000 t-$CO_2$)**




* $CO_2$ emissions after electric power distribution are used for the industry, commercial and transportation sectors, and $CO_2$ emissions before electric power distribution are used for the energy conversion sector.

## Table 1. Status of Vision development

| Already formulated, under consideration, to be considered | | | No plan to consider |
|---|---|---|---|
| | Already formulated | | None |
| | | 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 Automobile Manufacturers Association/Japan Auto-Bodies Industries Association | |
| | | Japan Mining Industry Association | |
| | | Japan Federation of Construction Contractors | |
| | | Japan Rubber Manufacturers Association | |
| | | Japan Aluminium Association | |
| | | Japan Petroleum Development Association | |
| | | Electric Power Council for a Low Carbon Society | |
| | | Petroleum Association of Japan | |
| | | Japan Gas Association | |
| | | Japan Franchise Association | |
| | | Japan Bankers Association | |
| | | Life Insurance Association of Japan | |
| | | Japan Foreign Trade Council | |
| | | General Insurance Association of Japan | |
| | | Real Estate Companies Association of Japan | |
| | | Japan Building Owners and Managers Association | |
| | | Japan Securities Dealers Association | |
| | | Japanese Shipowners' Association | |
| | | Scheduled Airlines Association of Japan | |
| | | East Japan Railway Company | |
| | Under consideration | | |
| | | Japan Cement Association | |
| | | Japan Auto Parts Industries Association | |
| | | Japan Lime Association | |
| | | Federation of Pharmaceutical Manufacturers' Associations of Japan | |
| | | Japan Federation of Printing Industries | |
| | | Flat Glass Manufacturers Association of Japan | |
| | | Japan Soft Drink Association | |
| | | Japanese Electric Wire & Cable Makers' Association | |
| | | Brewers Association of Japan | |
| | | Limestone Association of Japan | |
| | | Japan Department Stores Association | |
| | | Japan LP Gas Association | |
| | | Japan Trucking Association | |
| | | Japan Federation of Coastal Shipping Associations | |
| | | Shikoku Railway Company | |
| | | All Japan Freight Forwarders Association | |
| | To be considered | | |
| | | Japan Federation of Housing Organizations | |
| | | Japan Dairy Industry Association | |
| | | Japan Bearing Industrial Association | |
| | | Japan Society of Industrial Machinery Manufacturers | |
| | | Japan Copper and Brass Association | |
| | | Shipbuilders' Association of Japan & Cooperative Association of Japan Shipbuilders | |
| | | Japan Machine Tool Builders' Association | |
| | | Japan Sanitary Equipment Industry Association | |
| | | Flour Millers Association | |
| | | Japan Industrial Vehicles Association | |
| | | Japan Association of Rolling Stock Industries | |
| | | Japan Chain Stores Association | |
| | | Telecommunications Carriers Association | |
| | | Japan Association of Refrigerated Warehouses | Classification |
| | | Japan Hotel Association | Industrial sector |
| | | Telecom Services Association | Energy conversion sector |
| | | Japan Internet Providers Association | Commercial sector |
| | | Association of Japanese Private Railways | Transportation sector |

* Industries that have not disclosed their targets or performance in the past, namely, West Japan Railway Company, Central Japan Railway Company, Kyushu Japan Railway Company, and Japan Freight Railway Company, are not listed.

## 2. Pathways and efforts toward carbon neutrality by 2050

Each industry presents the aiming pictures and future images, and the pathways and milestones to achieve CN by 2050 in their Visions (Appendix 1).

### (1) Energy conversion sector

In the energy conversion sector, industries have presented efforts toward achieving CN by increasing the deployment of renewable energy and the sustained use of nuclear power.

While pursuing an energy mix that achieves "S+3E" at the same time, the electric power sector engages in "low-carbonization and decarbonization of electric power" (renewable energy: next-generation solar power, supercritical geothermal power, battery storage, hydrogen production; nuclear power: restarting, small modular reactors (SMR), molten salt reactors (MSR), high-temperature gas-cooled reactor (HTGR), nuclear fusion reactors; thermal: hydrogen and fuel ammonia power generation; CCS/CCU/carbon recycling, etc.) and "promotion of electrification" (deployment of heat pumps and IH, development and deployment of recharging infrastructure for EVs and PHVs, utilization of IoT and AI technologies, wireless power transmission and supply).

The petroleum industry will aim to achieve net zero $CO_2$ emissions (CN) associated with business activities and also contribute to achieve CN in society through such as supplying low carbon products by accelerating efforts to decarbonize supply chain and products, and by actively tackling R&D and social implementation of innovative decarbonization technologies that can leverage the existing infrastructure （e.g. fuels contributing to improved fuel efficiency in internal combustion engines, $CO_2$-free hydrogen, synthetic fuels, waste plastics recycling, feedstock conversion of petrochemical products, and CCS/CCU (carbon recycling)).

Under the policy to achieve carbon neutralization of gas, the gas industry will promote thorough shift to natural gas and high-efficient use of natural gas (fuel conversion from oil and coal, further deployment of cogeneration and fuel cells, and efficiency improvements in equipment, etc.), decarbonization of gas (methanation and hydrogen utilization, etc.), and development of CCS/CCU-related technologies.

### (2) Industrial sector

In the industrial sector, industries have presented efforts to establish technologies that fundamentally reduce $CO_2$ emissions.

Toward achieving carbon-neutral steel to contribute to CN by 2050, the iron and steel industry will explore multiple pathways by employing every possible means including

the drastic reduction of $CO_2$ emissions from blast furnace through “COURSE50 and ferro coke technologies plus CCUS”, development of super-innovative technologies such as “hydrogen-based iron making”, expanded use of scrap, using unharnessed waste heat of medium and low temperatures, and utilizing of biomass, etc.

Under the policy to allow the potential power of “chemistry” to emerge, thereby promoting and accelerating innovations that will resolve global issues and contributing to the growth of a sustainable society as a solution provider, the chemical industry will engage in the carbon circulation of raw materials (material use of $CO_2$, utilization of biomass as a feedstock, and utilization of plastics waste, etc.) and technological innovations to achieve energy saving (membrane separation processes, etc.).

The paper manufacturing industry will accelerate further its energy efficiency efforts and fuel conversion in production activities, such as active introduction of the latest energy-efficient facilities and technologies, increase of the utilization ratio of renewable energies, and commercialization of innovative technologies (e.g. electrification of paper machine dryers and kilns, development of highly efficient pulp production methods). It will also engage in unique efforts for global warming issues; it will contribute to reducing $CO_2$ emissions from product life cycles by developing and utilizing environment-friendly materials derived from woody biomass, such as cellulose nanofiber, bioplastics, biochemicals, and to expanding afforestation as a source of $CO_2$ absorption (promoting forest tree breeding of fast-growing species with high environment adaptability).

Under the policy of contributing to resolve social issues related to climate change and energy constraints through various business fields from the three perspectives of “technology development,” “co-creation”, and “resilience.”, the electrical and electronics industry will engage in innovating advanced energy conservation and carbon-free technologies (distributed power sources + next-generation battery storage, smart grids, CCUS, hydrogen production using water electrolysis, power semiconductors, rapid or wireless charging systems, etc.) and the social implementation of advanced data utilization solutions (autonomous driving systems, on-demand transportation systems, smart factories, on-demand manufacturing and logistics systems, accurate weather observation, and simulation technologies, etc.).

**(3) Related to the transportation sector**

Efforts to achieve CN in mobility and transportation have been presented in relation to the transportation sector.

The automobile industry will engage in deploying electric vehicles (HV, PHV, EV, FCV, etc.) and the achievement of a hydrogen economy (spreading FC-based mobility, etc.).

The maritime industry notes that efforts need to be made not only in ships but across the entire transportation chain, including new fuels and infrastructure to supply fuels. The industry will work on the shift to zero-emission vessels using alternative fuels such as carbon-recycled methane, ammonia, and hydrogen.

The aviation industry will engage in introducing new aircraft models, improving flight operations, and introducing and widely using sustainable aviation fuels (SAF).

The railway industry will promote the renewable energy power development and accelerate its deployment, achieve holistic energy management covering both supply and demand, introduce CCUS, deploy battery-powered rolling stock, develop fuel cell rolling stock, with a view to achieving net zero $CO_2$ emissions at every stage from energy production to consumption.

**(4) Commercial sector**

In the commercial sector, industries have presented efforts for thoroughly efficient energy use.

Envisioning a society that has reached CN by 2050 with widely deployed "energy-savings and renewable energy-conscious buildings, such as ZEB and ZEH", "buildings that use low-impact construction material," and "cities that enable community-wide $CO_2$ reductions by combining renewable energy facilities, storage batteries and power interchange", the real estate and office building industry will contribute through efforts to promote the conversion to ZEB and ZEH, ensure the traceability of construction materials, utilize HEMS and BEMS, and reuse buildings by renovating, in terms of individual buildings. In terms of entire communities, the industry will make efforts to promote the conversion to Zero Energy Towns (ZET) and to utilizes Community Energy Management Systems (CEMS).

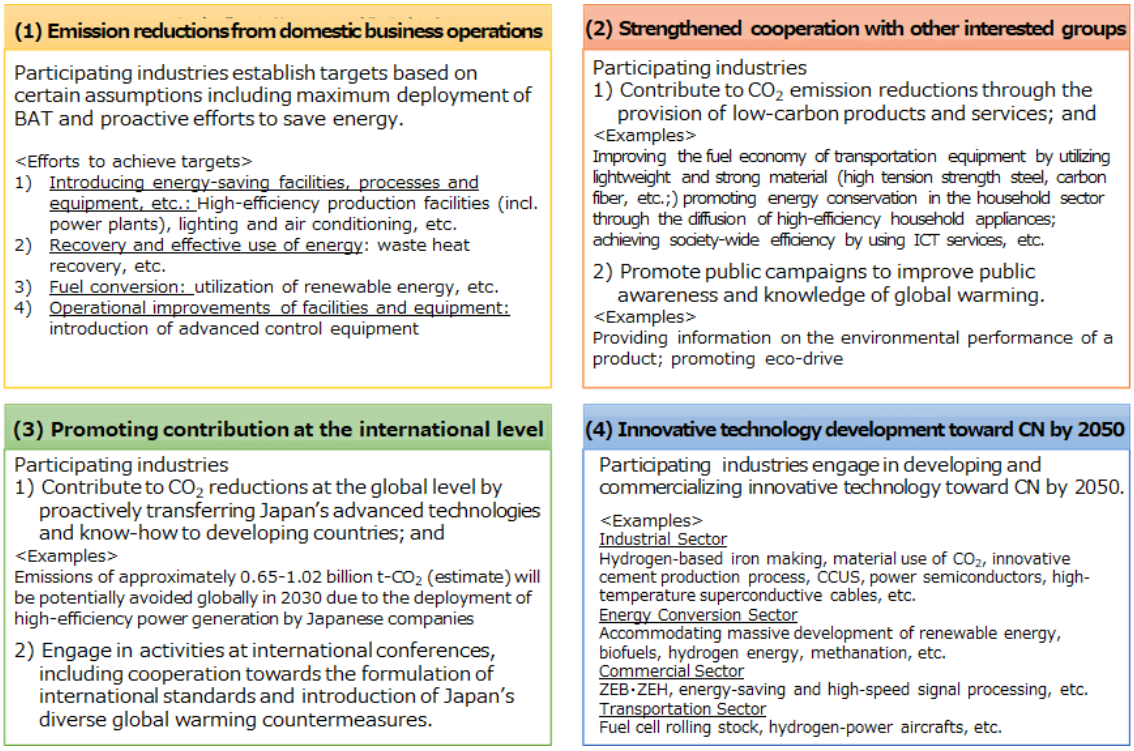
Keidanren will continue to invite participating industries to formulate a Vision and engage in firm efforts to achieve it.

## Part 2 Fiscal 2021 Follow-up Results Summary (Performance in Fiscal 2020) [Final Version]

Part 2 will report on the actual results of the emission reduction efforts undertaken by each industry in fiscal 2020 based on four pillars.

This Final Version will report on the follow-up results of all 62 participating industries. The reports submitted by individual industries can be found in the "Individual Sector Version" (only in Japanese).

**Figure 3. Four pillars of the Keidanren Carbon Neutrality Action Plan**



## Pillar 1: Emission reductions from domestic business operations

### (1) Performance in $CO_2$ emissions

Participating industries have set up and announced individual targets to reduce $CO_2$ emissions from their business operations as commitments to society and are engaged in efforts to achieve their targets.

It should be noted that given the increasing importance of the electric power industry's follow-up on $CO_2$ emissions from its own business operations (electric power generation), since the fiscal 2017 follow-up, the follow-up report presents the outcome of efforts as $CO_2$ emissions before electric power distribution (direct emissions) for $CO_2$ emissions from the energy conversion sector including the electric power industry, and as emissions after electric power distribution (indirect emissions) for emissions from other sectors (industrial, commercial, transportation). Furthermore, the preliminary $CO_2$ emission factor[1] for electric power use (emission coefficient for electricity) was used to calculate total $CO_2$ emissions in fiscal 2020.

#### ①All sectors

$CO_2$ emission trends[2]

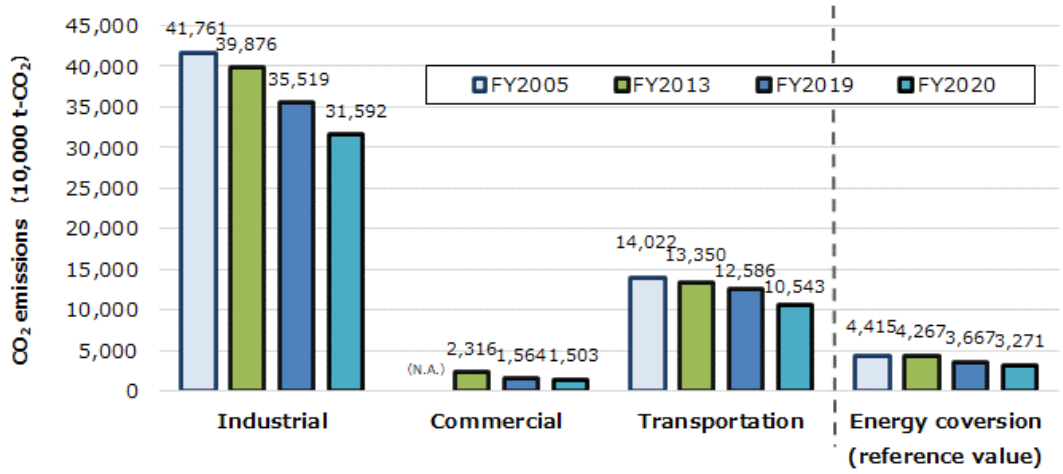
In fiscal 2020, $CO_2$ emissions were reduced in all sectors relative to fiscal 2013 levels (emission levels for the baseline year for Japan's 2030 target for global warming countermeasures in the medium term), and relative to previous fiscal year (fiscal 2019) levels (Figure 4).

[1] Basic emission coefficient (emission coefficient for actual emissions): 4.36 t-$CO_2$/10,000 kWh, post-adjustment emission coefficient: 4.39 t-$CO_2$/10,000 kWh

[2] Participating industries in each sector are as follows. Attachment 2 should be referred to for emissions, etc. in each industry.
Industrial sector: manufacturing (iron and steel, chemical, pulp and paper, electrical and electronics, cement, automobiles, etc.), mining, construction
Energy conversion sector: sectors that convert primary energy, such as crude oil, coal and natural gas into electric power and petroleum products (electric power generation, coal and petroleum manufacturing, gas manufacturing)
Commercial sector: tertiary industries excluding transportation-related and energy conversion businesses (telecommunications, retail, finance, etc.)
Transportation sector: passenger transportation, freight transportation

**Figure 4. $CO_2$ emissions by sector and rate of reduction (final count)**

Emissions after electric power distribution

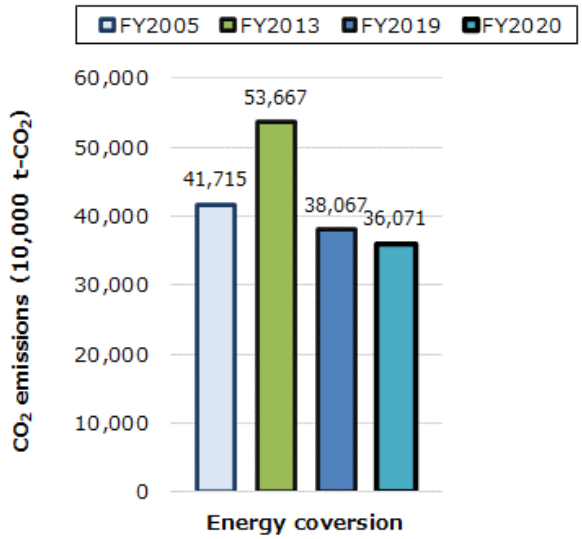



| Sector | Target industries / participating ind. | Fiscal 2020 actual emissions | Relative to fiscal 2005 | Relative to fiscal 2013 | Relative to previous FY (fiscal 2019) |
|---|---|---|---|---|---|
| Industrial | 31/31 industries | 315.92 Mt-$CO_2$ | -24.3% | -20.8% | -11.1% |
| Commercial | 14/16 industries | 15.03 Mt-$CO_2$ | | -35.1% | -3.9% |
| Transportation | 12/12 industries | 105.43 Mt-$CO_2$ | -24.8% | -21.0% | -16.2% |

NOTES:

- As emissions before electric power distribution are counted for the energy conversion sector, emissions after electric power distribution are provided for reference.
- Under the commercial sector, the Real Estate Companies Association of Japan and Japan Building Owners and Managers Association have not reported $CO_2$ emissions thus are not included in total actual emissions.
- Emissions data for fiscal 2005 have been recalculated based on the calculation method employed under the Keidanren Carbon Neutrality Action Plan for the purpose of comparison. However, emissions in the commercial sector in fiscal 2005 are not provided due to a large difference in the industries covered.

Emissions before electric power distribution



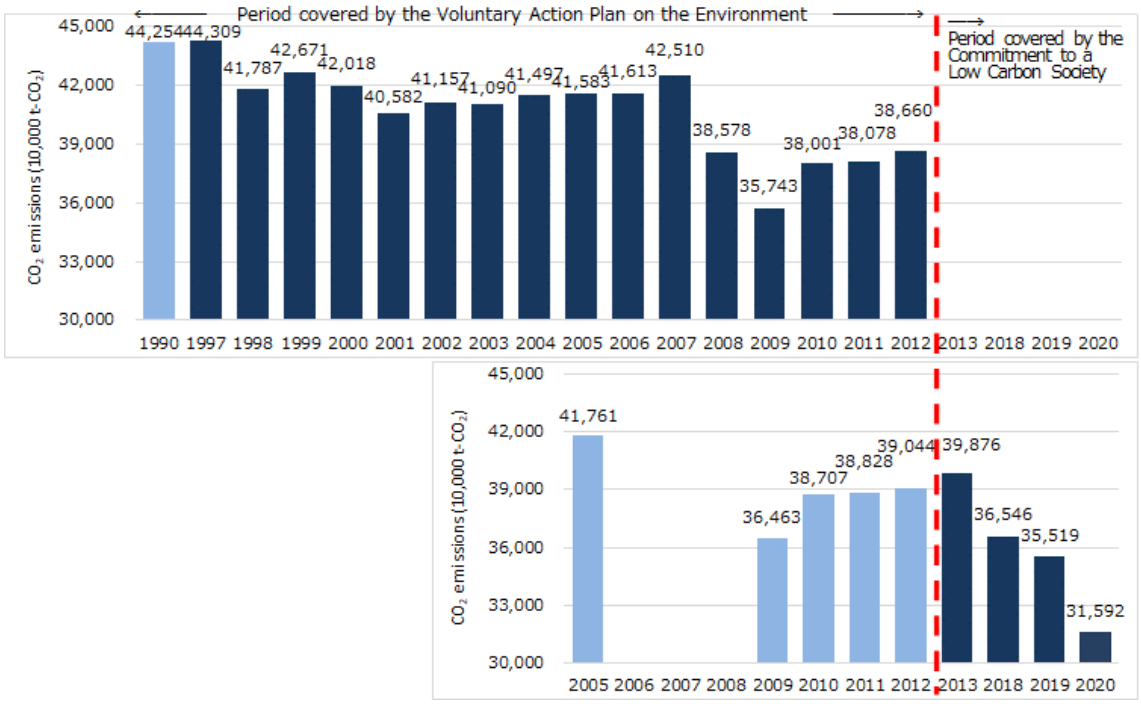

| Sector | Target industries/ participating ind. | Fiscal 2020 $CO_2$ emissions | Relative to fiscal 2005 | Relative to fiscal 2013 | Relative to previous FY (fiscal 2019) |
|---|---|---|---|---|---|
| Energy conversion | 3/3 industries | 360.71 Mt-$CO_2$ | -13.5% | -32.8% | -5.2% |

**②Industrial sector**

$CO_2$ emission trends

In fiscal 2020, 315.92 million t-$CO_2$ (after electric power distribution) (24.3% below fiscal 2005 levels, 20.8% below fiscal 2013 levels, and 11.1% below previous fiscal year levels) were emitted from the 31 industries of the industrial sector, thus continuing to follow a downward $CO_2$ emission trend since the Commitment was launched (Figure 5).

**Figure 5. Emissions in the industrial sector**
**(after electric power distribution, final count)**




NOTES:

- The period before and including fiscal 2012 was covered by the Keidanren Voluntary Action Plan on the Environment, and was succeeded by Keidanren's Commitment to a Low Carbon Society, which has covered the period from fiscal 2013.
- The figures for fiscal 2005-2012 under Keidanren's Commitment to a Low Carbon Society have been calculated and provided for reference. With the implementation of Keidanren's Commitment to a Low Carbon Society, calculation methods were renewed for emission coefficients for electric power (from generation-end emission coefficients to receiving-end emission coefficients) and for some industrial boundaries.

Factor analysis[3]

An analysis of changes in $CO_2$ emissions in the industrial sector (Figure 6) revealed that since fiscal 2005, $CO_2$ emissions due to "① change in economic activity" have followed a decreasing trend (22.9% below fiscal 2005 levels, 18.1% below fiscal 2013 levels, 12.4% below previous fiscal year levels). While this trend has continued since fiscal 2005, emissions decreased twofold to fourfold relative to the fiscal 2019 follow-up

[3] In order to identify the factors that contributed to changes in $CO_2$ emissions, factors have been broken down to the following three factors in line with the Kaya Identity: "① change in economic activity," "② change in $CO_2$ emission factor (change in $CO_2$ emission factor for energy)," and "③ change in energy consumed per unit of economic activity (change attributable to energy savings)." For example, declines in values for ① would imply that $CO_2$ emissions were reduced due to less economic activity, declines in ② would imply that $CO_2$ emissions were reduced due to decarbonization of energy, and declines in ③ would imply that $CO_2$ emissions were reduced as a result of energy saving efforts.

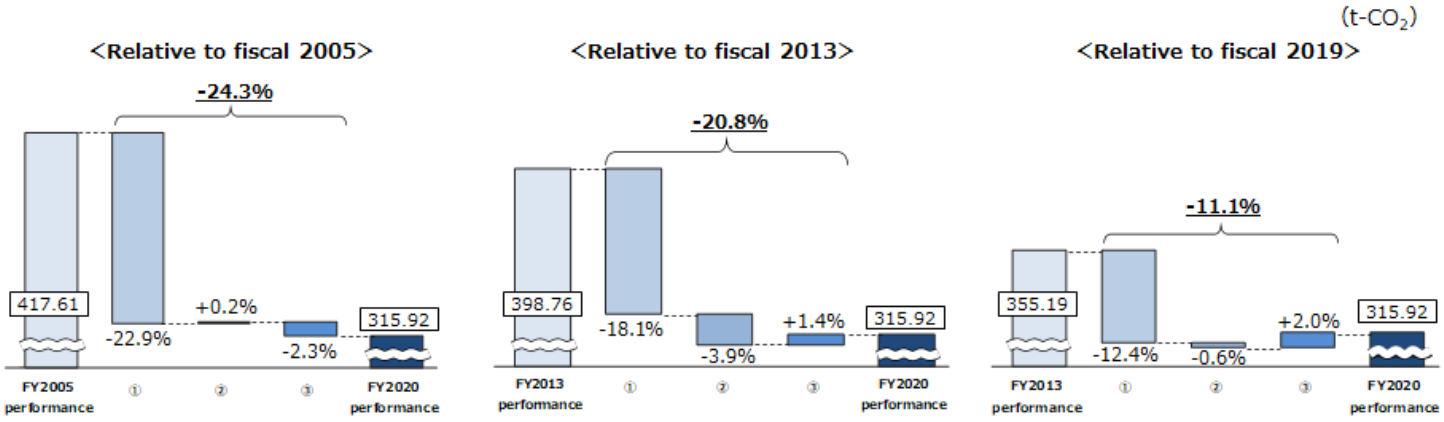
result. This is assumed to be due mainly to reduced production resulting from the COVID-19 pandemic.

Relative to previous year levels, overall $CO_2$ emissions decreased (-11.1%) despite an increase in $CO_2$ emissions due to "③ change in energy consumed per unit of economic activity" (+2.0%), as a result of $CO_2$ emission reductions due to "② change in $CO_2$ emission factor" (-0.6%) in addition to reductions due to "① change in economic activity" (-12.4%).

Since fiscal 2018, $CO_2$ emissions due to "③ change in energy consumed per unit of economic activity have continued to increase year over year. This is mainly because while production volumes dropped drastically due to COVID-19, production itself was continued, taking various measures with a minimal number of employees required for safe and stable operations; and therefore, a given amount of energy use was required regardless of production levels.

**Figure 6. Factor analysis of change in $CO_2$ emissions (after electric power distribution, final count) in the industrial sector**

① Change in economic activity
② Change in $CO_2$ emission factor (decarbonization of energy)
③ Change in energy consumed per unit of economic activity (energy savings)




NOTE: Figures have been rounded off; and therefore, the sum of ①, ② and ③ may differ from the rate of reduction relative to a fiscal year.

Major efforts made in fiscal 2020

$CO_2$ emission reductions in fiscal 2020 owes greatly to reduced economic activity due to the spread of COVID-19 infections.

On the other hand, the industrial sector has continued to contribute to reducing $CO_2$ emissions by engaging in fuel conversion, recovering and utilizing energy, introducing high-efficiency equipment, and improving operational processes (Table 2).

In fiscal 2020, the iron and steel industry implemented measures including the renewal of cooperative thermal power plants to GTCC (gas turbine combined cycle) and the high blast-temperature operation of blast furnace. Furthermore, in terms of the degradation of coke oven refractory bricks which have been a factor of increased $CO_2$ emissions, eleven coke ovens were renewed between fiscal 2013 and fiscal 2019, and two coke ovens are being renewed as of fiscal 2020. Moreover, from the perspective of enhancing the transparency and effectiveness of the overall efforts made under Carbon Neutral Action Plans formulated by the industry, the industry has acquired ISO50001, certification for an international standard for energy management systems, in 2014 and has renewed certification for six years since.

In fiscal 2020, the chemical industry invested around 63 billion yen in equipment, reducing 500,000 t-$CO_2$. In other words, the industry has promoted $CO_2$ emission reductions by making capital investments of around 130,000 yen to reduce 1t of $CO_2$. Similarly, the electrical and electronics industry spent 160,000 yen in capital investments to reduce 1t of $CO_2$ in fiscal 2020 and this cost has been rapidly increasingly over the past two to three years. This shows that in order to further promote energy conservation measures and continue $CO_2$ emission reductions, greater amounts of capital investment are required.

In terms of fuel conversion, industries continue to shift from heavy oil to natural gas, LPG, etc. In addition, many industries, including the iron and steel, chemical, paper manufacturing, cement, mining, limestone, rubber, aluminum, printing, glass, electric wire and cable, beer, and limestone mining industries, take measures in energy recovery and use, recovering waste heat, byproducts and steam from production processes for heat use in power generation and air conditioning (see “Pillar 1 (4) ② for details).

As aforementioned, industries pointed out that as a result of many years of cumulative efforts to reduce emissions, there is limited room for significantly effective investment in energy savings. Furthermore, some industries have yet to complete updating aged or deteriorating equipment due to a shortage of labor and cost-related restrictions. In addition, with recent changes in the product mix from low-mix high-volume production to high-mix low-volume production, some industries have been seeing less $CO_2$ emission reductions resulting from improved production efficiency.

**Table 2. Major efforts made in the industrial sector in fiscal 2020**

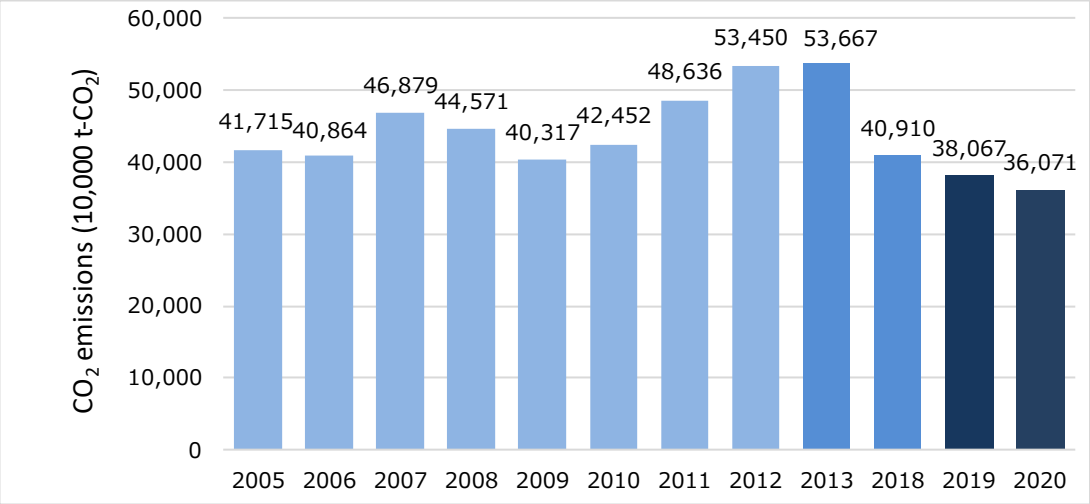
| **Improvement of efficiency of facilities** | |
|---|---|
| ・ Deployment of high-efficient equipment (heating furnaces, cracking furnaces, power generating facilities, HVAC (Heating, Ventilation, and Air Conditioning) equipment, transformers, pumps, compressors, motors, fans, freezers, etc.) | ・ Apply inverter technology to compressors<br>・ Renewal of coke ovens<br>・ Updating to high efficiency power generation facilities<br>・ Renewal to LED lighting |
| **Improvement of operations and processes** | |
| ・ Optimization of operational conditions and methods<br>・ Changing baselines and settings (temperatures, frequency of ventilation, level of cleanliness, brightness, hours of operation, etc.) | ・ Visualization of energy use<br>・ Sustained acquisition and renewal of international standards for energy management systems (ISO50001). |
| **Fuel conversion / energy recovery** | |
| ・ Conversion from heavy oil and kerosene to city gas, LPG, propane gas, electric power, alternative fuels (wooden pellets, recycled oil, recycled carbon fuels) | ・ Cogeneration<br>・ Regenerative burners<br>・ Waste heat recovery (enhanced thermal insulation of steam piping and hot water devices, reduction of heat carried away by products) |

### ③Energy conversion sector

$CO_2$ emission trends

In fiscal 2020, the three participating industries of the energy conversion sector collectively emitted 360.71 million t-$CO_2$ (before electric power distribution) (13.5% below fiscal 2005 levels, 32.8% below fiscal 2013 levels, and 5.2% below previous fiscal year levels), thus continuing to follow a downward emission trend (Figure 7).

**Figure 7. $CO_2$ emissions in the energy conversion sector (before electric power distribution, final count)**




NOTES:

- The Keidanren's Commitment to a Low Carbon Society covers the period from fiscal 2013. $CO_2$ emission figures under the Keidanren Voluntary Action Plan on the Environment, covering the period before and including 2012, were calculated as emissions after electric power distribution, and are therefore provided for reference.
- Since the Electric Power Council for a Low Carbon Society was established in fiscal 2015, earlier data are provided as reference. The data for fiscal years up to fiscal 2006 represent only the Federation of Electric Power Companies of Japan (FECP), and the data for fiscal 2007-2014 cover FECP and participating power producers and supplies (PPS). The figures used for the Japan Gas Association through 2012 have been derived from performance under the Voluntary Action Plan on the Environment which cover different boundaries.

Factor analysis

An analysis of the causes that led to changes in $CO_2$ emissions (before electric power distribution) in the energy conversion sector in fiscal 2020 (Figure 8) revealed that relative to fiscal 2013, $CO_2$ emissions due to "① change in economic activity" and "② change in $CO_2$ emission factor" decreased substantially (① -13.8%; ②-17.3%) along with reductions (-1.7%); and therefore, $CO_2$ emissions decreased by 32.8%. Relevant to the previous year, $CO_2$ emissions due to "① change in economic activity" decreased (-5.2%) whereas emissions due to "② change in $CO_2$ emission factor" and "③ change in energy consumed per unit of economic activity" were both unchanged.

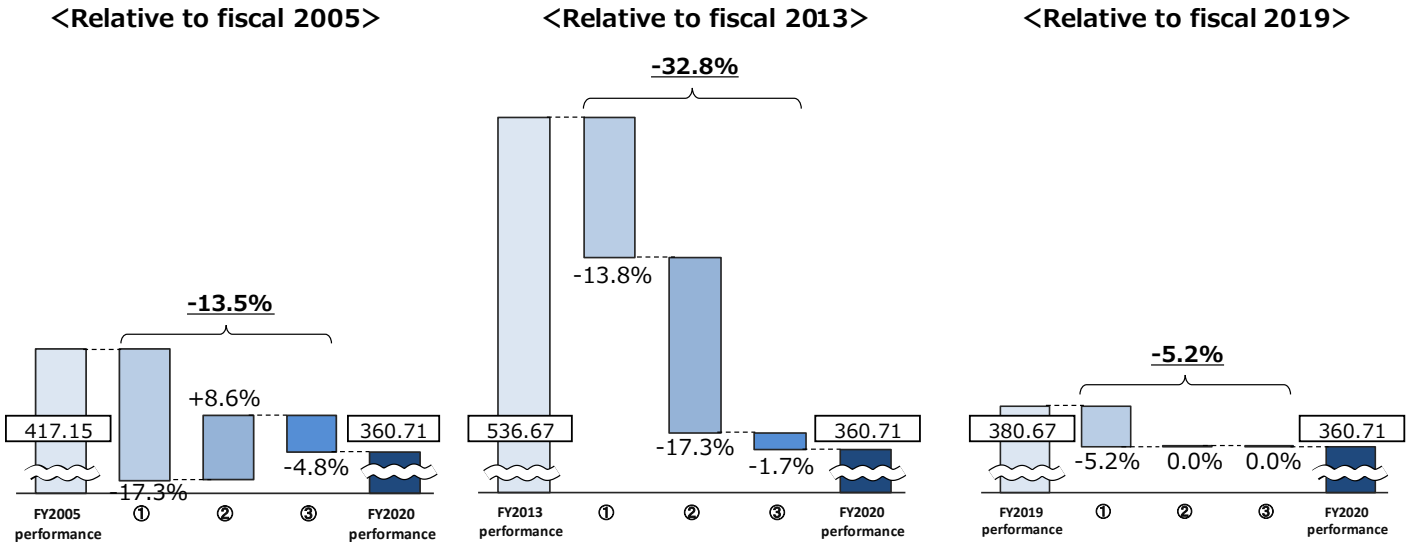
The petroleum and gas industries reported that emission reductions due to "① change in economic activity" owe greatly to reduced demand resulting from restrictions and self-imposed constraints to social and economic activity amid the COVID-19 pandemic. Reductions relative to fiscal 2013 levels regarding "② change in $CO_2$ emission factor" are attributable mainly to the continued operation of restarted nuclear power plants, the increased deployment of renewable energy, and the deployment of cutting-edge high-efficiency thermal power generation facilities. "③ Change in energy consumed per unit of economic activity" relative to the previous fiscal year was 0.0% although energy conservation efforts are being continued. The petroleum industry reported that affected by decreased demand due to the COVID-19 pandemic, the capacity factor of oil refineries dropped, thus aggravating energy intensity levels.

Relative to fiscal 2005, $CO_2$ emissions due to "② change in $CO_2$ emission factor" increased (+8.6%) given the prolonged suspension of nuclear power plants after the Great East Japan Earthquake in 2011, emissions due to "① change in economic activity" and "③ change in energy consumed per unit of economic activity" both decreased (-17.3% and -4.8%, respectively), and thus overall $CO_2$ emissions decreased (-13.5%).

**Figure 8. Factor analysis of change in $CO_2$ emissions (before electric power distribution, final count) in the energy conversion sector**

①Change in economic activity
②Change in $CO_2$ emission factor (decarbonization of energy)
③Change in energy consumed per unit of economic activity (energy savings)

($t\text{-}CO_2$)




Note: Comparisons with fiscal 2005 and fiscal 2013 levels are provided for reference because of the discontinuity of the data before and including fiscal 2014 and beyond fiscal 2015.

Major efforts made in fiscal 2020

The electric power industry promotes the utilization of nuclear power on the major premise of ensured safety, the development of hydro, geothermal, solar, wind, and biomass power generation, and the purchasing and deployment of renewable power under the FIT (feed-in-tariff) system. The industry is also engaged in reducing $CO_2$ emissions through continued efforts to improve the efficiency of thermal power generation, including LNG combined cycle power generation and ultra-supercritical coal-fired thermal power generation, as well as the by providing services such as V2X systems that link storage batteries and solar power and thus enable the utilization of EV batteries as emergency power sources (Table 3).

The petroleum industry reduces $CO_2$ emissions by compiling a broad range of individual measures. These include further sophisticating the operation and management of refineries and utility plants, increasing mutual heat utilization among devices, installing more equipment to recover waste heat and other waste energy, and adopting highly efficient devices and catalysts. The industry also uses government support programs for the rational use of energy to promote energy conservation.

It has been difficult in recent years for the city gas industry to achieve substantial reductions as almost all business operators have finished renewing LNG production processes, etc. However, the industry promotes further $CO_2$ emission reductions by installing high-efficiency equipment (utilization of waste heat from neighboring power plants, etc.) when updating facilities and altering facility operations within a scope that does not affect the stable supply of city gas (reviewing pump operations, etc.).

**Table 3. Major efforts made in the energy conversion sector in fiscal 2020**

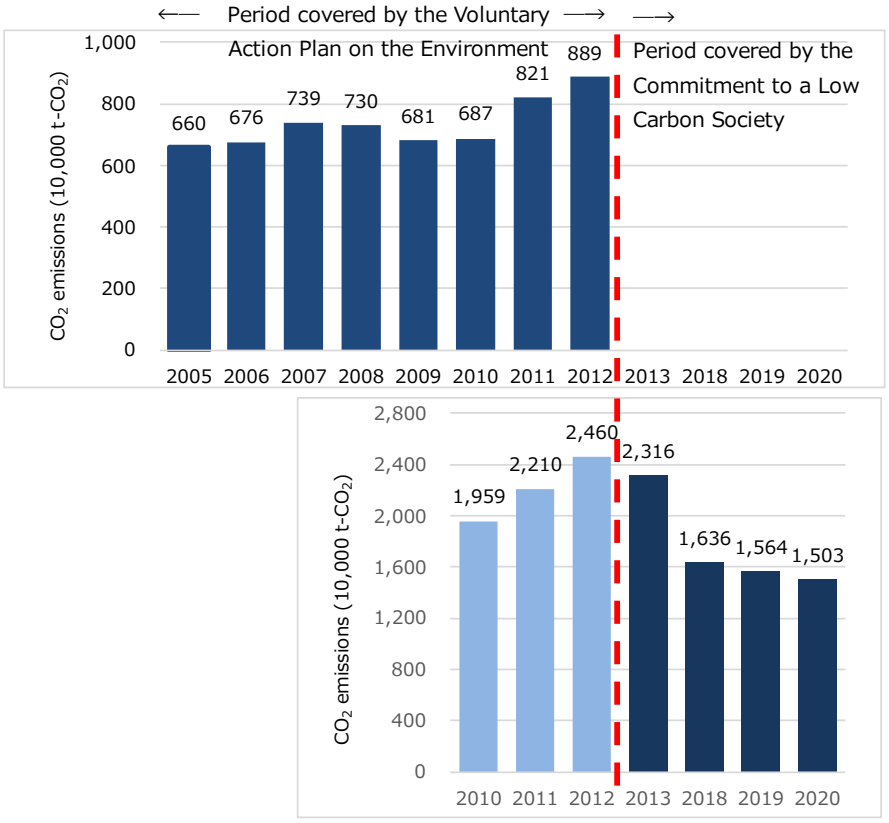
| | |
|---|---|
| **Introduction of high-efficiency facilities** | |
| ・ LNG combined cycle power generation<br>・ Ultra-supercritical coal-fired thermal power generation, etc.<br>・ Waste heat/waste energy recovery facilities<br>・ Adoption of high-efficiency devices and catalysts | ・ High-efficiency cogeneration equipment<br>・ Utilization of waste heat from neighboring power plants<br>・ Renewal to LED |
| **Creation of low carbon emission or zero emission energy** | |
| ・ Nuclear power on the major premise of ensured safety<br>・ Hydro, geothermal, solar, wind, and biomass power generation | ・ Combined combustion of wood biomass at coal-powered thermal power generation plants<br>・ Addressing wind and solar output variability |
| **Improvement of operations** | |
| ・ Further sophistication of control technologies and operation and management of refining and utility facilities at oil refineries<br>・ Mutual heat utilization among devices | ・ Distillation column: change in heat source; mitigation of minimal operation controls; lower pressure |
| **Provision of services** | |
| ・ Energy-saving consultation services<br>・ Electric power visualization services<br>・ Support for energy saving activities using call centers<br>・ ESCO (Energy Service Company) | ・ Energy saving diagnosis through security check operations<br>・ Provision of virtual renewable energy choices using non-fossil certificates<br>・ Measures to promote deployment of renewable power<br>・ Deployment of high-efficiency water heaters<br>・ Environmental household account books |

## ④Commercial sector

$CO_2$ emission trends

In fiscal 2020, the 14 participating industries of the commercial sector collectively emitted 15.03 million t-$CO_2$ (after electric power distribution) (35.1% below fiscal 2013 levels and 3.9% below previous fiscal year levels), and thus $CO_2$ emissions have followed a declining trend since the Commitment was launched (Figure 9).

**Figure 9. $CO_2$ emissions in the commercial sector (after electric power distribution, final count)**




NOTES:

- The period before and including fiscal 2012 was covered by the Keidanren Voluntary Action Plan on the Environment and was succeeded by Keidanren's Commitment to a Low Carbon Society, which has covered the period from fiscal 2013. The figures for fiscal 2010-2012 under Keidanren's Commitment to a Low Carbon Society are provided for reference.
- With the implementation of Keidanren's Commitment to a Low Carbon Society, calculation methods were renewed. (emission coefficients for electric power were changed from generation-end emission coefficients to receiving-end emission coefficients and some industrial boundaries were changed.)
- The Real Estate Companies Association of Japan and the Japan Building Owners and Managers Association have not reported emissions and are not included in the graph.

Factor analysis

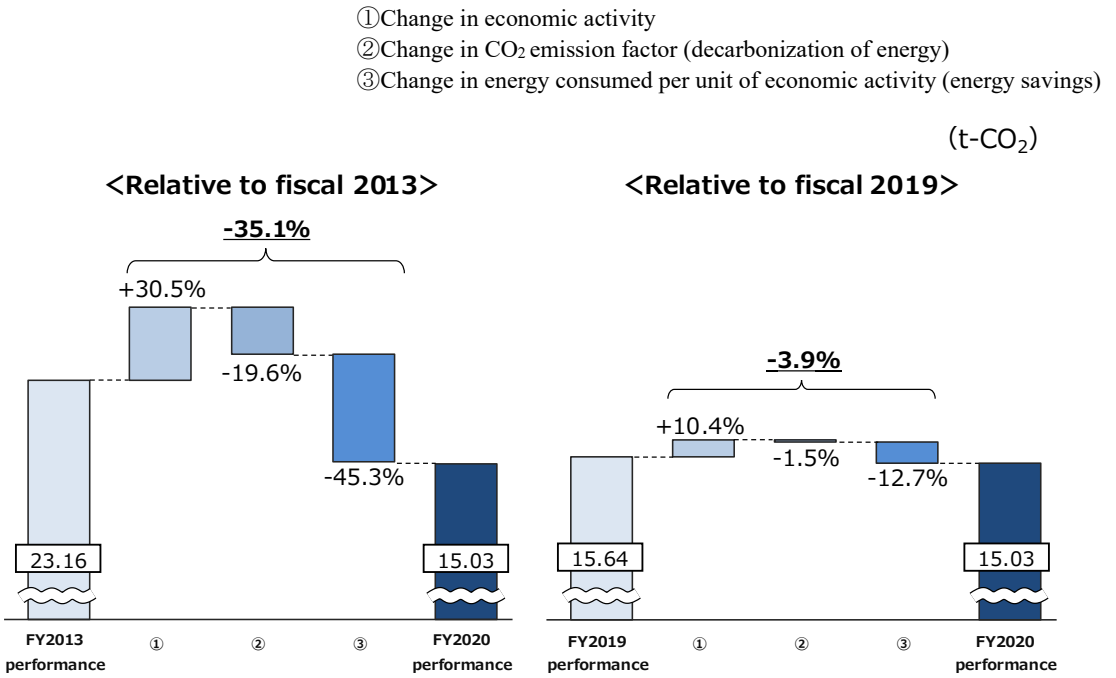
While some industries (refrigerating and warehouse, banking, and LP gas industries) reported that they were not significantly impacted by COVID-19, some industries (life insurance, foreign trade, real estate, building, and hotel industries) saw reductions in electric power consumption in the office and others (telecommunications, and telecommunication services industries) experienced an overall increase in electric power consumption as a result of increased electrical power use at home from teleworking despite decreased electric power consumption at the office. The convenience store industry reported that continued stay-at-home and teleworking has impacted the number of customers visiting stores located in commercial areas and tourist destinations, thus significantly reducing the volume of economic activity (sales).

An analysis of $CO_2$ emissions (after electric power distribution) in the commercial sector in fiscal 2020 (Figure 10) has revealed that relative to both fiscal 2013 and the previous fiscal year, $CO_2$ emissions significantly increased due to "① change in economic activity" (+30.5% and +10.4%, respectively). This is mainly attributable to the significant rise in information distributed across networks due to the emergence of diverse services and applications, such as the distribution of high-quality contents, including HD (high definition) images, as well as increased internet use and the widespread use of smartphones and tablets. In addition, the spread of COVID-19 has increased time spent at home, thus substantially increasing communications traffic. However, $CO_2$ emissions decreased due to "② change in $CO_2$ emission factor" (-19.6% and -1.5%, respectively) in addition to reductions due to "③ change in energy consumed per unit of economic activity" (-45.3% and -12.7%, respectively); and as a result, overall $CO_2$ emission reductions (after electric power distribution) in fiscal 2020 amounted to 35.1% below fiscal 2013 levels and 3.9% below previous fiscal year levels.

Factors leading to the reduction of $CO_2$ emissions due to "③ change in energy consumed per unit of economic activity" include the sector's continued efforts to limit electric power use by deploying telecommunications equipment with high energy saving performance, efficiently setting up and operating data center facilities, etc., deploying high-efficiency HVAC equipment and LED lighting, and deploying energy management systems, such as BEMS (Building Energy Management System), despite increases in communications traffic. Furthermore, most of the $CO_2$ emissions in the commercial sector are attributable to electric power use, and thus are largely affected by the emission coefficient for electric power. As indicated in the factor analysis of emissions in the energy conversion sector, the continued operation of restarted nuclear power plants, the increased deployment of renewable energy, and the deployment of cutting-edge high-

efficiency thermal power generation facilities, accompanied by a reduced share of coal- and oil-fired thermal power plants and an increased shared of LNG-fired thermal power plants have lowered the emission coefficient for electric power, thereby reducing $CO_2$ emissions due to "② change in $CO_2$ emission factor."

**Figure 10. Factor analysis of change in $CO_2$ emissions (before electric power distribution, final count) in the commercial sector**




NOTE: Figures have been rounded off; and therefore, the sum of ①, ② and ③ may differ from the rate of reduction relative to a fiscal year.

Major efforts made in fiscal 2020

The commercial sector has continued to reduce $CO_2$ emissions through introducing energy-saving and high-efficiency equipment and operational improvements. It has also promoted the introduction of renewable energy, such as solar and wind power, in the telecommunications, franchise chain, foreign trade, real estate, and telecommunication services industries (Table 3).

Operational improvements include the promotion of BEMS in the chain store, telecommunications, life insurance, foreign trade, and real estate industries. Such actions, along with working practice reform and the consolidation and reduction of office space promoted in many industries as a result of COVID-19, have contributed to reducing $CO_2$ emissions.

Particularly in the ICT (Information and Communication Technology) field, with the further utilization of big data, increased communications traffic is expected to increase electric power use. Under these circumstances, the telecommunications industry has taken measures to reduce electric power use, for example, introducing communication equipment (ICT devices, IP devices) with high energy-saving performance and the efficient construction and operation of facilities (simplified network facilities, high-efficiency wireless base stations, energy- saving measures at data centers). As a result, energy consumption (electric power use) in fiscal 2020 has only slightly increased from the previous fiscal year.

**Table 4. Major efforts made in the commercial sector in fiscal 2020**

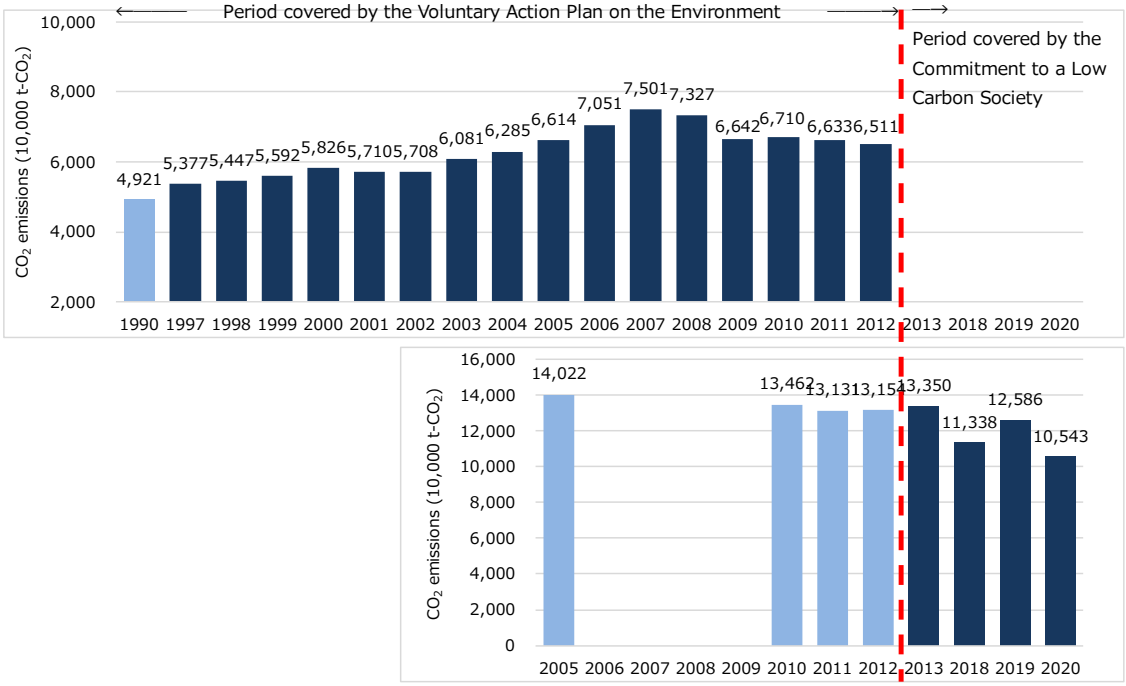
| **Introduction of energy-saving high-efficiency facilities** | |
|---|---|
| · High-efficiency wireless base station equipment<br>· Connection of ICT devices and IP devices to DC power sources<br>· High-efficiency HVAC systems<br>· High energy efficiency power sources<br>· High-efficiency transformers<br>· $CO_2$ refrigerant freezers<br>· UPS renewals<br>· LED lighting | · Human-detecting sensors<br>· Low emission vehicles<br>· Enhanced heat insulation (exterior air barriers, high performance insulating window glass, sun-shielding films)<br>· Tenant building renovation<br>· Construction of business locations meeting ZEB Ready standards<br>· Replacing corporate vehicles with HV |
| **Improvement of operations** | |
| · Energy-saving operation of lighting and HVAC equipment<br>· BEMS (Building Energy Management System)<br>· Peak shaving operations<br>· Promotion of teleworking | · Consolidation of office space<br>· Acquisition and operation of environmental management system<br>· Improved work management |
| **Fuel conversion to renewable energy** | |
| · Solar and wind power generation | |

## ⑤Transportation sector

$CO_2$ emission trends

In fiscal 2020, the 12 participating industries of the transportation sector collectively emitted 105.43 million t-$CO_2$ (after electric power distribution) (24.8% below fiscal 2005 levels, 21.0% below fiscal 2013 levels, and 16.2% below previous year levels), decreasing substantially from all baseline levels (Figure 11).

**Figure 11. $CO_2$ emissions in the transportation sector (after electric power distribution, final count)**




NOTES:

- The period before and including fiscal 2012 was covered by the Keidanren Voluntary Action Plan on the Environment and was succeeded by Keidanren's Commitment to a Low Carbon Society, which has covered the period from fiscal 2013. The figures for fiscal 2005-2012 under Keidanren's Commitment to a Low Carbon Society are provided for reference. Figures for fiscal 2005 do not include data for the Association of Japanese Private Railways and the East Japan Railway Company. Values differ greatly between figures under the Keidanren Voluntary Action Plan on the Environment and those under the Keidanren's Commitment to a Low Carbon Society mainly due to increased number of participating industries reporting $CO_2$ emissions.
- With the implementation of Keidanren's Commitment to a Low Carbon Society, calculation methods were renewed for emission coefficients for electric power (from generation-end emission coefficients to receiving-end emission coefficients) and for some industrial boundaries.
- Emissions from flights and shipping to and from overseas destinations are included for the Japanese Shipowners' Association and a part of the Scheduled Airlines Association of Japan

Factor analysis

An analysis of the causes that led to changes in $CO_2$ emissions (after electric power distribution) in the transportation sector in fiscal 2020 (Figure 15) revealed that $CO_2$ emissions due to "① change in economic activity" decreased substantially from all baseline levels in fiscal 2005, fiscal 2013, and the previous fiscal year (-18.6%, -26.1%, and -19.8%, respectively). This can be mainly attributed to limited human and material flow in the shipping, aviation, and railway industries due to the impact of COVID-19.

Relative to the previous year, $CO_2$ emissions due to "① change in economic activity" and "② change in $CO_2$ emission factor" decreased (-19.8% and -0.1%, respectively), and emissions due to "③ change in energy consumed per unit of economic activity" increased (+3.7%). Industries reported that the factors contributing to increased $CO_2$ emissions due to "③ change in energy consumed per unit of economic activity" included impacts of COVID-19, such as aggravated emission intensity due to a reduction in economic activity (revenue ton-kilometers) that exceeded reductions in production (number of flights operated) from limited human flows (aviation industry) or resulting from a relatively small rate of reduction in fuel consumption compared to the rate of decrease in economic activity (ton-kilometers carried) (trucking industry), despite continued introduction of and further improvements in energy-efficient vessels, aircrafts, trucks, and rolling stocks, etc., and efficient operations leading to energy-savings, pursued in each industry. $CO_2$ emission due to "② change in $CO_2$ emission factor" decreased not only on a year-on-year basis but also relative to fiscal 2013 (-1.3%) but increased relative to fiscal 2005 (+1.7%). It can be assumed that the contribution of this factor is limited compared to other sectors because the transportation sector comprises mainly industries that use fuels other than electric power.

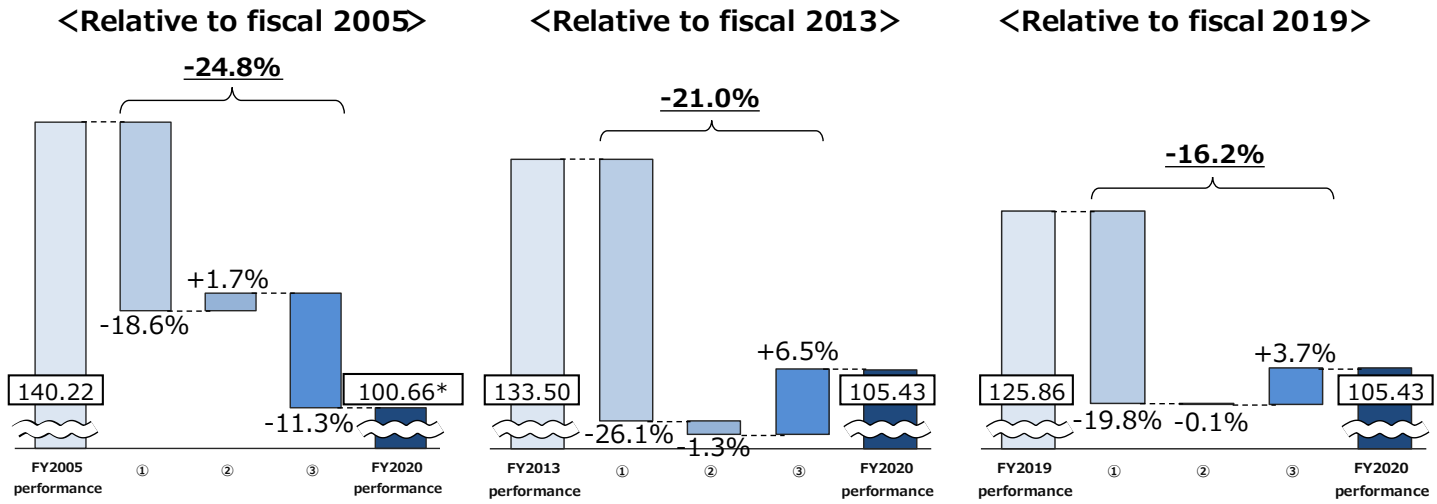
Relative to fiscal 2013, $CO_2$ emission due to "③ change in energy consumed per unit of economic activity" increased (+6.5%), while $CO_2$ emission due to "① change in economic activity" decreased (-26%); and therefore overall $CO_2$ emissions decreased (-21.0%)

Relative to fiscal 2005, emissions due to "② change in $CO_2$ emission factor" increased (+1.7%), while $CO_2$ emissions due to "① change in economic activity" and "③ change in energy consumed per unit of economic activity" decreased (-18.6% and -11.3%, respectively), resulting in overall $CO_2$ emission reductions (-24.8%).

**Figure 12. Factor analysis of change in $CO_2$ emissions (after electric power distribution, final count) in the transportation sector**

①Change in economic activity
②Change in $CO_2$ emission factor (decarbonization of energy)
③Change in energy consumed per unit of economic activity (energy savings)

($t\text{-}CO_2$)




NOTE:

- Figures have been rounded off; and therefore, the sum of ①, ② and ③ may differ from the rate of reduction relative to a fiscal year.
- Figures for fiscal 2005 do not include data for the Association of Japanese Private Railways Company and the East Japan Railway Company.

Major efforts made in fiscal 2020

As a major measure taken by the transportation sector, each industry has made advancements in the introduction and operation of highly efficient vessels, trucks, aircrafts, and railways. (Table 4).

The overseas shipping industry is engaged in $CO_2$ emission reductions in terms of both facilities and operations, including the adoption of high-combustion efficiency engines and low frictional resistance design when building new vessels, utilizing weather routing services and navigation support systems, and conducting slow navigation. The domestic shipping industry also contributes to $CO_2$ emission reductions by making energy saving improvements to the vessel and equipment when scrapping and rebuilding older ships.

The trucking industry has reduced $CO_2$ emissions by offering subsidies for the adoption of environment-friendly vehicles, such as CNG and hybrid vehicles, and for the installation of devices, such as air heaters (independent combustion heating equipment) and battery powered air conditioning devices.

The aviation industry promoted the downsizing of aircrafts and the retirement of old models amid reduced economic activity due to COVID-19.

The railway industry has introduced energy-efficient rolling stocks with regeneration brakes that recover electric power from kinetic energy when decelerating and VVVF inverters that reduce electric power loss. It has also installed LED lights and high-efficiency large-scale HVAC systems on platforms, concourses and rolling stock centers.

**Table 5. Major efforts made in the transportation sector in fiscal 2020**

| | |
|---|---|
| **Introduction and operation of high-efficiency international and domestic vessels** | |
| ・ Low frictional resistance design, coating, and devices<br>・ High combustion efficiency engines<br>・ Effective use of waste heat<br>・ Cleansing vessels, coating, propeller polishing<br>・ Improvements in combustion efficiency of main engines | ・ Turning off pumps not in use when in harbor<br>・ Utilization of weather routing and navigating systems<br>・ Slow navigation<br>・ Optimization of fuel oil and ballast water |
| **Introduction and operation of high-efficiency trucks** | |
| ・ CNG vehicles, hybrid vehicles | ・ Devices to support efforts to refrain from vehicle idling |
| **Introduction and operation of high-efficiency aircrafts** | |
| ・ Downsizing operated aircrafts | |
| **Introduction and operation of high efficiency rolling stock** | |
| ・ Energy-efficient rolling stock with regeneration brakes and VVVF inverters<br>・ Large high-efficiency HVAC facilities | ・ Renewal of interior lighting, station platform and concourse lighting to LED |

**(2) Emissions reduction efforts made at corporate headquarters and other offices and in logistics**

Non-commercial sector industries have also taken measures for energy conservation and decarbonization in their corporate headquarters and offices. These measures include deploying high-efficiency HVAC equipment, LED lighting, human-detecting sensors, thermal insulating glass, as well as continued meticulous efforts to turn off the lights when not in use, taking out certain lights, manage HVAC temperature settings, limit the number of elevators in operation, etc. Some industries developed their own electric power consumption targets for offices and continue to make efforts to be in line with the target. Some industries reported contributing to $CO_2$ emission reductions by implementing working practice reform, including promoting teleworking, improving operational efficiency, and converting to a paperless office, which led to less electric power consumption in the office and reduced waste incineration. There were also reports related to renewable energy, including installing solar and wind power generation facilities and purchasing green electric power certificates.

$CO_2$ emissions per floor area were reduced relative to fiscal 2013 levels in all 20 industries that reported in this index, with the exception of one industry for which fiscal 2013 data is not available. Fifteen industries achieved reductions by more than 30%. On a year-on-year basis, reductions were seen in 16 industries. Two industries referred to impacts of the COVID-19 pandemic. These industries noted that a possible factor of reduced emissions was the decrease in people working at the office which led to less energy consumption and that increased emissions could be attributed to enhanced ventilation which undermined the effectiveness of HVAC temperature control.

In the logistics area, various emission reduction measures are being taken not only in the transportation sector but also in other sectors. Industries reported introducing digital tachographs and energy-saving tires, promoting a modal shift, employing larger vehicles and vessels, and streamlining logistics through joint delivery of products with other companies, promoting the deployment of natural gas vehicles and fuel cell vehicles, and managing vehicles and their operation using telematics.

$CO_2$ emissions per unit of freight travel were reduced relative to fiscal 2013 and previous year levels in 3 industries out of the 6 industries that reported on this index.

These efforts have contributed to reducing $CO_2$ emissions from corporate headquarters and other offices, as well as from logistics in many industries (Appendix 2).

### (3) Status of carbon credit utilization

A survey on the use of carbon credits revealed that one industry had utilized J-credits. Some industries were considering the utilization of credits in the next fiscal year or beyond if they encountered difficulties in achieving Phase II (fiscal 2030) targets.

### (4) Status of deployment of renewable energy[4], energy recovery and utilization

#### ① Renewable energy

Industries and companies are increasingly deploying renewable energy with a view to achieving CN.

Acknowledging that renewable energy, as a non-fossil fuel source, can contribute to CN, Keidanren called for the creation of an appropriate business environment that fulfills three requirements, namely, lower costs, stable supply, and sustainable business, with a view to turning renewables into a major electric power source, in its first proposal on electric power "Rebuilding Japan's Electricity System" (April 2019)[5]. Given the Government's October 2020 announcement of CN by 2050, Keidanren published a second policy proposal "Policy Proposal on Japan's Electricity System for Achieving Carbon Neutrality by 2050"[6], in which it positioned "Society 5.0 with Carbon Neutrality" as the long-term vision of a fundamental society-wide and economy-wide transformation. Based on this proposal, Keidanren has pointed out that from the perspective of achieving green growth through efforts to CN by 2050 despite various geographical constraints, Japan needs to enhance access to renewable energy value and to revisit regulations in the short and medium term, as well as to develop and deploy technologies and to foster a good business environment in the long-term.

Furthermore, some electric power users seeking to improve the environmental soundness of their business operations, including by joining international initiatives[7] on climate change countermeasures, have embarked on deploying and developing renewable energy and thus engage in efforts to decarbonize the energy that they use or to achieve carbon neutrality.

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[4] "Renewable energy" is defined in this section as: photovoltaic power, wind power, hydropower, geothermal power, solar heat, atmospheric heat and other heat and biomass found in nature (Source: Act on Sophisticated Methods of Energy Supply Structures and Ordinance (Cabinet Order 222 of 2009))

[5] Keidanren "Rebuilding Japan's Electricity System -Electricity Policy to Realize Society 5.0" (April 2019) http://www.keidanren.or.jp/en/policy/2019/031.html

[6] Keidanren "Policy Proposal on Japan's Electricity System for Achieving Carbon Neutrality by 2050" (March 2021) https://www.keidanren.or.jp/en/policy/2021/025.html

[7] For example, CDP (formerly, Carbon Disclosure Project), RE100, and SBT (Science Based Targets)

In fiscal 2020, total renewable electric power at transmission and receiving end (including FIT-certified electric power sources) amounted to 153.1 billion kWh, accounting for approximately 20% of total electric power at transmission and receiving end. The breakdown is 47.9% hydropower, 38.7% solar power, 5.9% biomass, 4.7% wind power, 1.4% geothermal power, and 1.4% waste-to-energy. Around half of total renewable electric power at transmission and receiving end (including FIT-certified electric power sources) in fiscal 2020 was generated by the electric power industry.

Many industries other than the electric power industry are engaged in generating electric power from renewable energy, mainly solar power, hydropower, and biomass, but also including geothermal energy, for self-use.

In the chemical industry renewable power use amounted to 1.3 billion kWh, accounting for 5% of power consumption derived from fossil fuels. Hydropower accounted for almost all of the renewable power in fiscal 2005, but power sources have become diversified in recent years, with an increasing share of biomass and solar power.

The pulp and paper industry has continued its energy conversion efforts, shifting from fossil fuels to non-fossil fuels. In fiscal 2020, it continued to increase the ratio of renewable energy, mainly biomass, and refuse-derived fuels relative to fiscal 2005.

In the cement industry, some factories use woody biomass as an alternative to fossil fuels at their onsite power generation facilities, with an aim to improve their energy intensity.

Other industries also promote renewable power generation for self-consumption. The electrical and electronics, rubber, dairy products, convenience store, foreign trade, and real estate industries use mainly solar, and the aluminum industry uses hydropower in part. The industrial machinery industry generates power using solar PV at 17 business establishments and biomass at 3 locations.

Furthermore, many industries, including those from the commercial sector, reported that they were promoting $CO_2$-free electric power purchases. The printing and chain store industries reported that an increasing number of companies have introduced or are considering the introduction of PPAs[8].

In order to turn renewables into a major electricity source, it is also important to take measures for the development and practical application of technologies. Participating industries promote the massive deployment of renewable energy and technology development for efficient energy use through various efforts.

[8] PPA: Power Purchase Agreement (an agreement where solar power systems, etc. are installed on the rooftop of a business operator's building free of charge and the power generated is bought by consumers, such as the business operator)

② **Energy recovery and utilization**

Industries are also making efforts to reduce fuel consumption by recovering and utilizing waste heat and byproduct gases that are generated during manufacturing or fuel use (Table 6).

The iron and steel industry uses byproduct gases for power generation, utilizes steam, generates power using TRT (top-pressure recovery turbines), uses steam recovered by CDQ (coke dry quenching) for power generation, etc. This has led to avoided emissions of around 27.40 million t-$CO_2$ (estimates have been made from final figures of the FY 2019 Comprehensive Energy Statistics).

The cement industry continues to make capital investments even amid COVID-19. Not only has increased use of waste-to-energy led to reduced energy intensity, but waste heat power generation accounted for 11.7% of electric power consumption in fiscal 2020, thus contributing greatly to $CO_2$ emission reduction.

Furthermore, the gas industry reported using waste heat from neighboring power generation plants and several other industries reported introducing binary cycle power generation utilizing heat recovered from steam.

**Table 6. Examples of renewable energy and energy recovery and utilization**

| **Renewable energy** | |
|---|---|
| ・ Development and deployment of hydro, geothermal, solar, wind, and biomass power generation<br>・ Biomass power generation (wood biomass, black liquor, wood refuse), geothermal power generation<br>・ Installation of solar power generation systems in factories, warehouses, offices etc. | ・ Introduction of PPA-based projects (solar power)<br>・ Hydropower generation and wind power generation at corporate establishments<br>・ Purchasing renewable electric power<br>・ Promoting the massive deployment of renewable energy (various research and technology development, demonstration)<br>・ Development of technologies for efficient energy use |
| **Energy recovery and utilization** | |
| ・ Power generation using waste heat, byproduct gases, recovered steam, etc.<br>・ Binary cycle power generation<br>・ Use of waste as an alternative energy source | ・ Utilization of waste heat from boilers as a heat source for HVAC<br>・ Use of waste heat for neighboring power plants<br>・ Steam and hot water recovery from waste heat in a cogeneration system |

**(5) Coverage of current survey against total domestic emissions[9]**

The coverage ratio of $CO_2$ emissions in fiscal 2020, calculated for each sector in the current follow-up survey against total domestic sectoral $CO_2$ emissions in fiscal 2020 (preliminary figures) was 79% for the industrial sector, 85% for the energy conversion sector (before electric power distribution), 8% for the commercial sector, and 31% for the transportation sector. The industrial and energy conversion sectors have maintained a relatively high level of coverage.

[9] It should be noted that the figures in National Institute for Environmental Studies "Fiscal 2020 GHG Emissions Data of Japan (preliminary figures)," the source of total domestic emissions by sector in fiscal 2020 and those of the current survey have been derived using different calculation methods and boundaries due to their different purposes and backgrounds; and therefore, the coverage ratios should be used only for reference. Coverage for the transportation sector was calculated based on domestic $CO_2$ emissions excluding overseas departures and arrivals.

## Pillar 2: Strengthening cooperation with other interested groups

In order to achieve society-wide $CO_2$ emission reductions, it is important that $CO_2$ emissions are reduced not only from individual corporate business operations but also through collaborative efforts with various actors, including consumers, customer companies, employees, local residents, central and local governments and educational institutions. Participating industries contribute to society-wide $CO_2$ emission reductions across the entire life cycle by developing and providing the products and services which contribute to CN. Moreover, various industries have come to supply renewable energy.

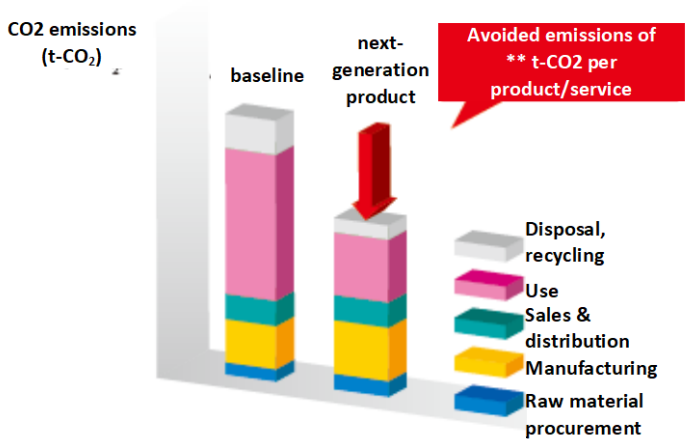
Furthermore, participating industries reach out to the residential sector, the users of products and services, and to public campaigns by providing information on environmental performance and burden, offering consulting services on energy saving, and promoting eco-drive campaigns in order to raise public awareness and knowledge of global warming prevention and fostering public campaigns.

**(1) Efforts to reduce emissions through product and service life cycles**

Focusing on $CO_2$ emissions from product and service life cycles, it is important to reduce total emissions, including not only those from product manufacturing and provision, but also those from procuring raw materials and distribution, using products and disposal and recycling.

For example, even if a high-performance energy efficient product emits more $CO_2$ than conventional products during manufacturing due to the increased complexity of the manufacturing process, substantial reductions of $CO_2$ emissions from the high-performance product itself can reduce overall $CO_2$ emissions in terms of the entire product life cycle. Furthermore, if the product can be recycled after use, we can reduce the input of new resources, and thus contribute to reducing $CO_2$ emissions (Figure 13).

**Figure 13. Life cycle $CO_2$ emission reductions**




Source: Compiled based on "Contributing to Avoided Emissions through the Global Value Chain - A new approach to climate change measures by private actors -." by Keidanren.

Such reductions are possible in services, as well as products. For example, the utilization of ICT service solutions allows people to work from home or remotely on the go, enabling flexible workstyles that are not constrained by time or location. This has contributed to society-wide emission reductions, including reduced use of electric power during work or reduced travels, in addition to increased work efficiency.

Participating industries have quantified their actual and expected emission reductions[10].

For example, the iron and steel industry has compiled calculations of $CO_2$ emissions avoided in the product use stage when conventional steel is replaced with high-function steel. Total avoided $CO_2$ emissions in Japan and overseas attributable to representative high-function steel [11] manufactured during fiscal 1990 through fiscal 2020 were calculated to be 32.26 million t-$CO_2$ in fiscal 2020.

The chemical industry estimates avoided $CO_2$ emissions attributable to residential thermal insulation material that increase the airtightness and thermal insulation properties of a home to be 75.80 million t-$CO_2$ in fiscal 2020.

The automobile industry calculated its avoided $CO_2$ emissions in fiscal 2020 to be 5.46 million t-$CO_2$ due to fuel efficiency improvements and the deployment of next-generation vehicles (HV, PHV, EV, FCV, etc.). In association, the rubber industry reported that in fiscal 2006-2016, fuel efficient tires contributed to avoiding emissions of 2.97 million t-$CO_2$.

[10] Focusing on emission reductions along entire value chains, Keidanren published "Contributing to Avoided Emissions through the Global Value Chain - A new approach to climate change measures by private actors -" to raise awareness of efforts made by industries and companies. https://www.keidanren.or.jp/en/policy/2018/102.html

[11] High tensile strength steel for automobiles, high tensile strength steel for ships, steel pipes for boilers, grain-oriented electrical steel sheets, stainless steel sheets

In addition, the electrical and electronics industry introduced examples of contributions by digital solutions utilizing AI and IoT, including cloud services for energy resource aggregation, high-precision solar power generation forecasting services utilizing AI, service infrastructure supporting the digital transformation of manufacturing industries, services to optimize plans using AI, EV cloud services, support for smart city building, and satellite observation solutions.

Furthermore, in many industries other than the electric power industry, more companies are engaged in selling renewable power under the FIT scheme, as well as generating renewable power (mainly solar, wind, and biomass) for self-consumption.

The chain store and department store industries are also engaged in calculating and announcing Scope 3 emissions with a view to reducing emissions across supply chains.

**(2) Efforts leading to emission reductions in the residential sector**

Achieving the fiscal 2030 target of reducing $CO_2$ emissions by more than 60% will, of course, require the wise use of the aforementioned products and services on the part of users, but it is also important for citizens to reflect upon their consciousness, actions and decisions, and change their lifestyles.

Participating industries and companies engage in public relations and educational activities to encourage wise use of low-carbon and energy-saving products and transformations in lifestyles, as well as raise awareness among employees and their families by promoting the use of environmental household account books and "eco-driving," and collaborate with communities, local governments and educational institutions through hosting environmental learning events. Furthermore, some industries reported that they participated in the "COOL CHOICE" campaign or implemented environmental awareness-raising campaigns (Table 20).

**Table 7. Examples of efforts leading to emission reductions in the residential sector**

| **Promotion among employees and their families** | |
|---|---|
| ・ Implementation of environmental household account books<br>・ Introduction of e-learning, hosting in-house seminars<br>・ "Jisa Biz (staggered working hours)" and off-peak commuting | ・ Air conditioning temperature control, turning off unnecessary lights<br>・ In-house "eco-point" program<br>・ Eco-drive |
| **Collaboration with local communities and governments and educational institutions** | |
| ・ Supporting local elementary, junior high and high schools in environmental education | ・ Participation in local government-led "eco-challenge" activities |
| **Participation in public campaigns** | |
| ・ Participation in "COOL CHOICE," "Lights Down Campaign," "Fun to Share," "Eco-action 21"<br>・ Implementation of "Cool Biz" and "Warm Biz" campaigns | ・ Promotion of intermodal transportation (park & ride)<br>・ Purchasing environment-friendly products (green procurement) |

### (3) Fostering and conserving forest sinks

Dealing with global warming also calls for measures to foster and conserve forest sinks. In the fiscal 2020 follow-up, industries reported on their involvement in forest and Satoyama (village forest) conservation activities and tree-planting activities in areas close to business locations and on private land. In addition to these activities, from the perspective of buyers of a product, green procurement (purchase) standards have been established; and therefore, by purchasing products that meet the provisions of the Act on Promoting Green Procurement or products bearing environmental labels ("ecomark", etc.), the business community contributes to the appropriate use of forest sinks.

The flat glass industry has requested wooden packaging suppliers to acquire FSC (Forest Stewardship Council) CoC (Chain of Custody) certification to confirm the use of FCS-certified raw materials across the entire supply chain. The dairy, convenience store, life insurance, general insurance, and hotel industries have also adopted raw materials certified under various certification schemes, including those of FSC, PEFC, the Rainforest Alliance, and RSPO. In this way, more industries are engaged in conserving and fostering forest sinks through their business activities.

## Pillar 3: Promoting contribution at the international level

While it is undisputable that global warming countermeasures call for domestic greenhouse gas emission reductions, climate change is a global issue. Given increased CO2 emissions expected as a result of increased energy use especially in emerging and developing economies, the Japanese business community needs to promote emission reductions on a global scale.

Since product and service value chains are spread across the world, it is important to take emission reduction measures that consider global value chains from upstream (raw material procurement) to downstream (use, disposal and recycling)[12].

In the fiscal 2021 follow-up, industries reported that they were contributing to emission reductions on a global scale by reducing $CO_2$ emissions through the introduction of low carbon energy-saving products such as electric vehicles, and by providing and transferring excellent technologies through promoting low carbon energy-saving electric power generation projects that utilize technologies and knowhow fostered in domestic business operations, electric power generation from renewable energy, and energy recovery (Table 8).

The automobile industry calculated cumulative avoided $CO_2$ emissions from global sales of next-generation vehicles (HV, PHV, EV, FCV, etc.) in 2000-2020 to be 65.42 million t-$CO_2$.

The aluminum industry calculated avoided $CO_2$ emissions as a result of promoting recycling in fiscal 2020 to be 11.26 million t-$CO_2$.

The gas industry calculated avoided $CO_2$ emissions from overseas LNG and power generation businesses undertaken by city gas business operators to be 12.90 million t-$CO_2$. Furthermore, avoided $CO_2$ emissions from overseas sales of gas tankless water heaters, such as Eco−Jozu, by gas equipment manufacturers were calculated to amount to 11.80 million t-$CO_2$.

Mostly in the electric power and gas industries and in the foreign trade industry, there were many reports of companies taking part in electric power generation projects using renewable energy in various parts of the world. The foreign trade industry has drawn upon their know-how in turnkey contracts for electric power infrastructure construction projects and providing services such as maintenance and inspection to engage in the IPP (Independent Power Producer) business worldwide; and in recent years it is focused on renewable power generation projects. As a result of these efforts, avoided $CO_2$ emissions

[12] The Government's Long-term Strategy also includes the approach of avoided emissions through the global value chain (GVC).

in fiscal 2020 were calculated to be 11.23 million t-$CO_2$. There is increased activity to financially support such efforts; and therefore, in the banking industry, an increasing number of banks are offering loans or project finance for renewable energy projects yearly.

The industrial vehicles industry reported a case where renewable power was installed at all European subsidiaries by selecting the most optimal procurement method in light of the energy-related circumstances of each location.

The industrial machinery industry reported various projects, including energy efficient sea water desalination projects in South Africa and Saudi Arabia, a binary power generation project at a geothermal power plant in the Philippines, waste-to-energy projects in Cambodia and the Maldives and a tire-to-energy project in Indonesia, that utilized NEDO projects, JCM support projects and subsidized projects by public interest incorporated foundations.

The sanitary equipment industry reported a case where a company participated in the green building material program under the Ministry of Economy, Trade, and Industry and introduced Japanese water-saving toilet standards to ASEAN economies.

As described above, some of these efforts include quantifying avoided $CO_2$ emissions, as done in estimating reductions under "Pillar 2: Strengthening cooperation with other interested groups." Reductions are expected to increase across the entire global value chain as companies visualize the advantages of their products and services by quantifying avoided emissions, thus accelerating the transfer of low-carbon energy-saving technologies.

Some issues, including determining a baseline for calculation and how to calculate reductions overlapping among industries when a target product covers several industries or companies, have been identified. With an aim to solve these issues and to improve the transparency of the basis for calculation and approach taken, the Ministry of Economics, Trade and Industry published the "Guidelines for Quantifying GHG emission reductions of goods or services through Global Value Chain" (March 2018) to be referred to when explaining calculations to other parties.

Furthermore, participating industries are proactively involved in international scheme design, including efforts for international standardization. The printing industry, in partnership with paper manufacturing industry, has led discussions on the international standardization of evaluation methods for paper recycling and deinking. Paper recycling involves a deinking process that could be internationally standardized in a versatile manner, thus advancing paper recycling at a global level and contributing to energy conservation. Such efforts lead to a global understanding of quantifying avoided

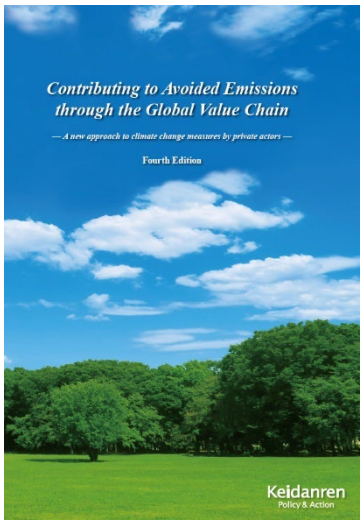
emissions and the proper evaluation of the efforts made by the Japanese business community.

Keidanren has revised the concept book "Contributing to Avoided Emissions through the Global Value Chain -A new approach to climate change measures by private actors-" (published in fiscal 2018) to encourage emission reductions across the global value chain (Figure 14). While this is not equivalent to the PDCA cycle under the Action Plan, it serves to promote the deployment of low carbon energy-saving technologies by sharing concepts and case studies with various stakeholders.

**Table 8. Examples of overseas contribution to avoided emissions**

| **Avoiding emissions through overseas transfer of Japanese technologies and knowhow** |
|---|
| ・Caustic soda production technologies using ion-exchange membrane, Non-phosgene polycarbonate production process, synthetic rubber for eco tire (Japan Chemical Industry Association) |
| ・Hydropower generation at corporate mines (Japan Mining Industry Association) |
| ・Aluminum recycling (Japan Aluminium Association) |
| ・Electric power generation technologies utilizing waste heat (Flat Glass Manufacturers Association of Japan) |
| ・$CO_2$ recovery from coal-fired thermal power plants and EOR (Japan Petroleum Development Association) |
| ・Solar, wind, geothermal, and hydro power generation projects (Electric Power Council for a Low Carbon Society) |
| ・LNG projects, solar and wind power generation projects, gas engine CGS, gas tankless water heaters, Enefarm, GHP (The Japan Gas Association) |
| ・IPP (independent power producer) business using renewable energy (Japan Foreign Trade Council) |
| ・Lending and project financing for renewable energy development projects (Japan Bankers Association) |
| ・Factories operating on 100% renewable power (Japan Industrial Vehicles Association) |
| ・Ocean water desalination systems, waste-to-energy plant using municipal solid wastes, power generation utilizing used tires (Japan Society of Industrial Machinery Manufacturers) |
| **Avoiding emissions through overseas diffusion of Japan's advanced low-carbon products and services** |
| ・Cooperation in energy-saving and environmental fields, including transferring and deploying energy-saving technologies (The Japan Iron and Steel Federation) |
| ・Lightweight paper (Japan Paper Association) |
| ・High efficiency thermal power generation and renewable power generation technologies, IT products, solutions (Liaison Group of Japanese Electrical and Electronics Industries for Global Warming Prevention) |
| ・Next-generation vehicles (Japan Automobile Manufacturers Association) |
| ・Energy-saving ships (Shipbuilders' Association of Japan & Cooperative Association of Japan Shipbuilders) |
| ・Permanent magnet synchronous motors (PMSM) for railway vehicles (Japan Association of Rolling Stock Industries) |

**Figure 14. Concept book: "Contributing to Avoided Emissions through the Global Value Chain - A new approach to climate change measures by private actors –"**




Full text can be found on the Keidanren website:
http://www.keidanren.or.jp/en/policy/vape/gvc2018.pdf

## Pillar 4: Development of innovative technologies toward carbon neutrality by 2050

In light of promoting the CN Action Plan, Keidanren made clear that the goal of innovative technology development is CN by 2050 and multiple efforts need to be made to achieve this goal.

In order to significantly reduce $CO_2$ emissions with a view to achieve CN by 2050, it is indispensable to create completely new innovations that are not an extension of conventional efforts. This will require research and development and social implementation in the medium- to long-term, which will call for strong government support. Keidanren requests that the government develops its determination for achieving CN by 2050 into concrete action by mobilizing various policy resources, including budgetary measures valid across multiple years at a scale that is comparable to other countries.

In the fiscal 2021 follow-up, participating industries reported that they were formulating roadmaps toward CN by 2050 and promoting efforts to develop and commercialize innovative technologies (including transition technologies) that would achieve significant $CO_2$ reduction (Tables 9 and 10).

The iron and steel industry is engaged in technology development for the commercial use of COURSE50, which aims to collectively reduce $CO_2$ emissions by approximately 30% by means of using hydrogen for iron ore reduction and $CO_2$ capture and storage, under a roadmap to develop a full-scale plant in around 2030 and widely deploy the technology in around 2050. In fiscal 2020, in the first phase of technology development, the industry engaged in the operation, design, and data analysis of a pilot blast furnace, successfully achieving the interim target of "acquiring prospects of reducing $CO_2$ emissions from the blast furnace reduction by 10%".

Furthermore, with a view to commercialization in 2030 or beyond, the chemical industry is developing plastic feedstock production processes using $CO_2$; the cement industry is developing an innovative cement production process; the petroleum development industry is engaged in carbon capture and storage (CCS); the copper and brass industry is developing heteronano-structure superhigh strength copper alloys; the petroleum industry is developing bio-aviation fuels, hydrogen supply chains, liquid fuels manufactured from carbon dioxide, and processes to recycle waste plastics into petrochemical feedstock; the gas industry is engaged in methanation, which is a process that combines $CO_2$-free hydrogen and carbon dioxide to make methane; and the aviation industry is engaged in efforts related to hydrogen-powered aircrafts. In the energy

conversion sector, the electric power industry is promoting the ammonia co-firing, single fuel firing (ammonia), and the hydrogen co-firing at thermal power plants.

In 2020, Keidanren launched the “Challenge Zero” initiative to strongly communicate in Japan and overseas and encourage challenging efforts made by companies and organizations to innovate (Figure 15). Keidanren seeks to strongly promote “Challenge Zero” in collaboration with the Government to initiate a “game change” where actors race to achieve innovation while also attracting ESG investment and seeking partnerships within and across industries as well as among industry, academia, and government.

**Table 9. Examples of innovative technologies (feedstock, manufacturing, products and services) and the timing of deployment**

| Timing of deployment | Innovative technologies and services (industry) |
|---|---|
| Deployment started | ・Cellulose nanofiber (Japan Paper Association)<br>・Net Zero Energy House; ZEH (Real Estate Companies Association of Japan)<br>・Green chemistry, extended-release tablets, continuous production, Manufacturing classification system (The Federation of Pharmaceutical Manufacturers' Associations of Japan)<br>・Closed-loop (horizontal) recycling systems (Japan Aluminium Association)<br>・Full oxy-fuel combustion (Flat Glass Manufacturers Association of Japan)<br>・Electrical forklifts with lithium-ion batteries (Japan Industrial Vehicles Association)<br>・Smart energy networks, low-cost hydrogen production devices (The Japan Gas Association)<br>・5G, digital coherent signal processing technologies and high-speed optical communication (Telecommunications Carriers Association) |
| 2021 and beyond | ・$CO_2$ recovery and recycling from waste heat from burning furnaces (Japan Lime Association)<br>・Sophisticated shipbuilding processes utilizing IoT (Shipbuilders' Association of Japan & Cooperative Association of Japan Shipbuilders)<br>・Designing Five-axis MC (machining centers) made from CFRP (carbon fiber reinforced plastics) (Japan Machine Tool Builders' Association)<br>・Methanation, hydrogen burner furnaces (Japan Industrial Vehicles Association)<br>・Fuel cell hybrid railway cars (Japan Association of Rolling Stock Industries)<br>・High-efficiency petroleum refining technologies based on petroleomics, greenization of refineries (Petroleum Association of Japan)<br>・LNG bunkering supply technologies (The Japan Gas Association)<br>・Sustainable aviation fuels (SAF) (Scheduled Airlines Association of Japan)<br>・Fuel cell rolling stock, storage battery-powered railway system (ACCUM), use of renewable energy in railway operation (installation of solar power systems at stations) (East Japan Railway Company |
| 2030 and beyond | ・COURSE50, ferro coke (The Japan Iron and Steel Federation)<br>・Precision manufacturing processes for functional chemical products, plastic feedstock production processes using $CO_2$, etc., manufacturing processes for organosilicon functional chemical products (Japan Chemical Industry Association)<br>・Innovative cement production process (Japan Cement Association)<br>・Heat storage equipment that harnesses the cumulative chemical heat of lime to recover and reuse high-temperature waste heat from factories (Japan Lime Association)<br>・Innovative heat exchange/heat control technologies, advance resource circulations system for aluminum materials (Japan Aluminium Association)<br>・CCS (Japan Petroleum Development Association)<br>・Hetero-nano superhigh strength copper alloy material (Japan Copper and Brass Association)<br>・Decarbonization of fuel powering large heavy machinery (Lime Association of Japan)<br>・Bio-aviation fuel supply chains, hydrogen supply chains, production of liquid fuels from |

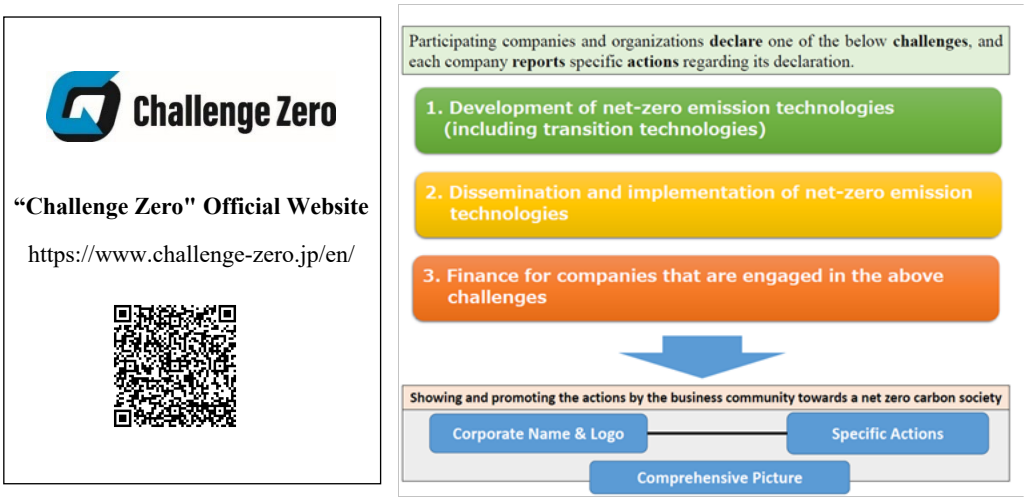
| | |
|---|---|
| | $CO_2$, process to make petrochemical feedstock from waste plastics, accelerated carbonation processes using calcium in recovered from industrial waste, including concrete waste (Petroleum Association of Japan)<br>・ High-temperature superconductive cables (The Japanese Electric Wire & Cable Makers' Association)<br>・ Methanation (The Japan Gas Association)<br>・ Hydrogen-powered aircrafts (Scheduled Airlines Association of Japan) |

**Table 10. Example of roadmaps for developing and deploying innovative technologies (feedstock, manufacturing, products and services)**

| Industry | Innovative technologies (feedstock, manufacturing, products and services) | 2020 | 2025 | 2030 | 2050 |
|---|---|---|---|---|---|
| The Japan Iron and Steel Federation | COURSE50 | R&D | | Full-scale plant | Deployment |
| Japan Chemical Industry Association | Plastic feedstock production processes using $CO_2$ | | R&D, commercialization | | Business phase |
| Japan Paper Association | Cellulose nanofiber (CNF) | | Market creation | | Market expansion |
| Japan Cement Association | Innovative cement production processes | Preliminary considerations | Confirm manufacturing conditions, product adaptability, economic rationality | | |
| Japan Mining Industry Association | Reduction of $CO_2$ emissions by increasing share of recycled feedstock used in smelting on-site | Demonstration | Phased increase in amounts processed | | |
| Japan Rubber Manufacturer Association | Hydrogen utilization technologies | Domestic: demonstration | Domestic: Continue consideration - commercialization | Domestic; commercialization – deployment<br>Overseas: considerations – commercialization | Domestic: deployment<br>Overseas: deployment |
| The Federation of Pharmaceutical Manufacturers' Associations of Japan | Green chemistry technologies | Sophistication | | | |
| Japan Aluminium Association | Advanced resource circulation system for aluminum materials | R&D | | | Commercialization |
| Japan Federation of Printing Industries | High efficiency printing machine | Continue evaluation | | Increase use | Mainstream |
| Flat Glass Manufacturers Association of Japan) | Full oxy-fuel combustion technologies | | Consider deployment at timing of cold repair | | |
| The Japanese Electric Wire & Cable Makers' Association | High-temperature superconductive cables | Technology development | | Demonstration | |
| Japan Petroleum Development Association | CCS (in Japan) | Demonstration | Environmental planning, demonstration | | Commercialization |
| Japan Copper and Brass Association | Development of "heteronano"- superhigh strength copper alloys that contribute to the energy conservation strategy | Basic research, demonstration | | Commercialization | Deployment |

| | | | | | |
|---|---|---|---|---|---|
| Shipbuilders' Association of Japan & Cooperative Association of Japan Shipbuilders | Sophisticated shipbuilding processes utilizing IoT | | Commercialization | Deployment | |
| Japan Society of Industrial Machinery Manufacturers | Design and development of five-axis MC (machining centers) made from CFRP (carbon fiber reinforced plastics) | R&D | | | |
| Japan Industrial Vehicles Association | Large-scale storage batteries | | Verification | Introduction | Deployment in other similar industries |
| Japan Association of Rolling Stock Industries | Fuel cell hybrid railway cars | Demonstration | | | |
| Electric Power Council for a Low Carbon Society | Thermal power generation technologies that reduce environmental burden (ammonia co-firing, hydrogen co-firing) | | Demonstration | Start operations; increase co-firing ratio | Single fuel firing (ammonia) |
| Petroleum Association of Japan | Large-scale hydrogen supply chain establishment | R&D | | Demonstration | Commercialization |
| The Japan Gas Association | Methanation | R&D, demonstration | | Commercialization | Business expansion |
| Telecommunications Carriers Association | Energy-saving and high-speed opto-electronic signal processing technologies | | Develop specifications | | |
| East Japan Railway Company | Development of fuel cell rolling stock | Development | Demonstration | Introduction | Increased deployment |

**Figure 15. "Challenge Zero" (Challenge Net Zero Carbon Innovation)**



## Controlling non-$CO_2$ greenhouse gas emissions

Global warming countermeasures involve emission reductions of not only $CO_2$, but also of other greenhouse gases[13].

HCFCs and HFCs, which bear high warming potential and thus impose a large impact on global warming, are used as refrigerants in freezers and HVAC equipment. The production and consumption of HCFCs have been controlled globally based on the Montreal Protocol on Substances that Deplete the Ozone Layer (hereinafter, "Montreal Protocol"), the amendment (Kigali Amendment) to which came into effect in January 2019, obligating signatory nations to reduce production and consumption volumes of HFCs. In accordance with the Amendment, domestic production and consumption of HFCs will be reduced in phases; and therefore, the development of green refrigerants, including refrigerants with low GWP (Global Warming Potential) and fluorocarbon-free refrigerants is essential.

Participating industries are endeavoring to improve the recovery rate of existing refrigerants upon disposal, as well as to develop technologies to reduce emissions and put new technologies into practical use (Table 11).

Based on the Fluorocarbon Emission Control Law enacted in April 2020, many industries are taking measures to prevent leakage during inspections and implement scheduled updates of the equipment. Industrial machinery industry, beer industry, sanitary equipment industry, convenience store industry, and hotel industry, reported efforts to install fluorocarbon-free refrigerators and freezers in their factories and stores. The gas industry reported promoting the deployment of gas absorption cold/hot water heaters that do not use any fluorocarbons. The refrigerated warehousing industry, which deals with many cooling facilities hosted a workshop on the treatment of fluorocarbon refrigerants with the acknowledgement of the Ministry of the Environment and the Ministry of Economy, Trade, and Industry to foster more people with knowledge of the Fluorocarbon Emission Control Law.

Regarding gases other than fluorocarbons, the foreign trade industry reported that it was promoting a business to supply bunker fuel (LNG) that emits no sulfur oxides and 40-70% less nitrogen oxides compared to conventional fuels.

[13] Methane ($CH_4$), nitrous oxide ($N_2O$), sulfur hexafluoride ($SF_6$), and fluorinated gases (HCFC, HFC, PFC, etc.)

**Table 11. Major efforts to reduce non-$CO_2$ greenhouse gas emissions**

- Replacement of fluorinated refrigerants used in refrigerators and freezers with fluorocarbon-free refrigerants (The Japan Society of Industrial Machinery Manufacturers, Japan Sanitary Equipment Industry Association, Japan Franchise Association, Japan Hotel Association)
- Promotion of HFC-free factories, deployment of low-GWP refrigerants and $CO_2$ refrigerant freezer (HFO refrigerants) (Brewers Association of Japan)
- In the HVAC area, deployment and promotion of gas absorption cold/hot water heaters that use no fluorocarbons (The Japan Gas Association)
- Organization of a workshop on the treatment of fluorocarbon refrigerants (Japan Association of Refrigerated Warehouses)
- Greenhouse gas emission reductions achieved by destroying fluorinated gases (Japan Cement Association)
- Prevention of leakage upon the installation, inspection, and repair of equipment, recovery and reuse (Japan Federation of Housing Organizations, Japan Federation of Printing Industries, Japan Dairy Industry Association, Japanese Electric Wire & Cable Makers' Association, Japan Society of Industrial Machinery Manufacturers, Shipbuilders' Association of Japan & Cooperative Association of Japan Shipbuilders, Limestone Association of Japan, Japan Sanitary Equipment Industry Association, Flour Millers Association, Japan Association of Rolling Stock Industries, The Electric Power Council for a Low Carbon Society, Telecommunications Carriers Association, Japan Association of Refrigerated Warehouses, Real Estate Companies Association of Japan, Japan Hotel Association)
- Business to supply shipping companies bunker fuels (LNG) with low environmental burden (no sulfur oxide emissions and 40-70% less nitrogen oxide emissions compared to conventional fuels) (Japan Foreign Trade Council)

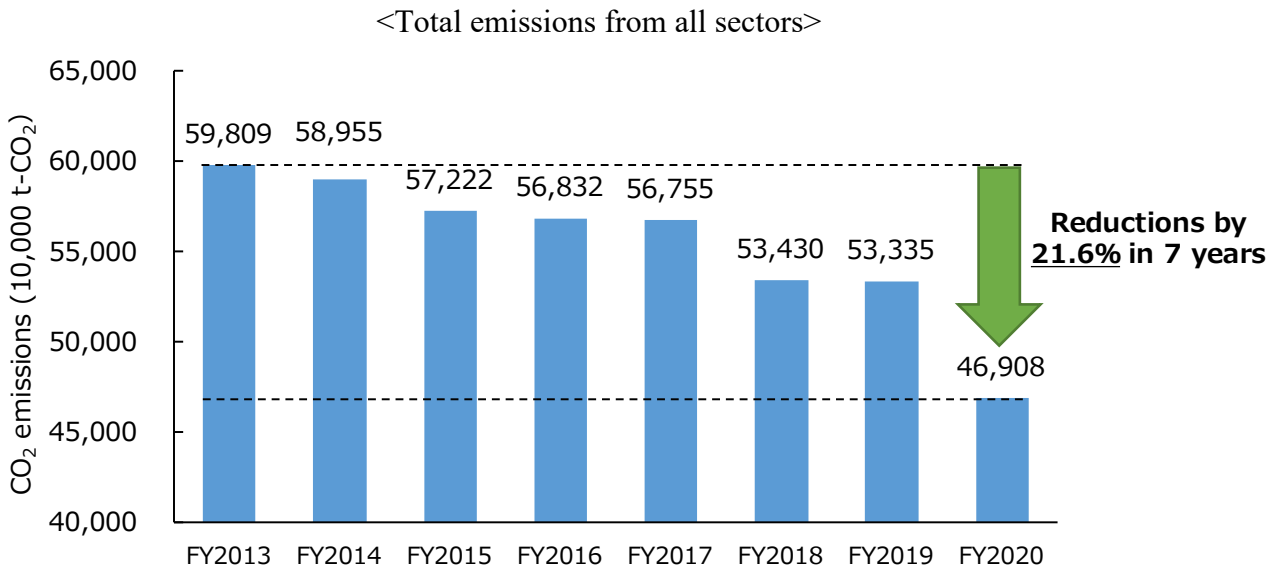
# Part 3　Summary of Phase I

## 1. Emission reductions in Phase I

Part 3 will observe the performance made in Phase I (fiscal 2013-2020).

$CO_2$ emissions from the industrial, energy conversion, commercial and transportation sectors have steadily decreased every year, amounting to reductions by 21.6% in seven years (Figure16). However, it should be noted that the drastic drop in the final year (fiscal 2020), emissions was largely impacted by reduced economic activity due to the spread of COVID-19. (Emissions were reduced by 10.8% across the 6 years between fiscal 2013 and 2019.)

**Figure 16. Results of Phase I - Performance in fiscal 2013-2020 -**




NOTE:

- Performance in fiscal 2013-2020 <Total for all sectors> represents the total $CO_2$ emissions (after electric power distribution) from 60 industries out of the 62 participating industries. The most recent heat values and carbon emission coefficients available at the time of the survey have been used for calculating $CO_2$ emissions.
- The scope of calculations differ between fiscal 2013 and fiscal 2020 due to offshoring, etc.

## 2. Achievement rate of Phase I targets

A survey of the achievement rate of Phase I targets (Table 12) revealed that 47 industries had achieved their targets, 1 industry had partly achieved their targets, and 10 industries underachieved their targets.

Of the industries that achieved their targets, 14 industries achieved their new targets, which they had set up when they renewed their previous targets to more ambitious ones.

Many industries that were not successful in reaching their targets raised the impact of COVID-19 as the factor of the results. Some industries experienced a rapid drop in production volumes compared to the range forecasted when the target was initially set up, but since factories did not completely suspend operations, fixed energy consumption aggravated emission intensities (chemical, auto parts, lime production, rubber, copper and brass, and machine tool builders industries). Other industries reported that emission intensities were aggravated by a drop in economic activity (revenue ton-kilometers) that exceeded the decrease in production (number of flights operated) caused by constrained human flow (aviation industry) or by significant trucking trends featuring frequent short-distance travels with small loads which led to a smaller rate of reduction in fuel consumption compared with that of the drop in economic activity (ton-kilometers carried) (trucking industry).

Of the ten industries that underachieved their targets, five industries had achieved their targets in fiscal 2019, when the impact of COVID-19 can be assumed to be small.

Factors other than COVID-19 include the fact that the emission coefficient for electric power used when setting up the target was 0.33 kg-$CO_2$/kWh, whereas performance was based on a coefficient of 0.444 kg-$CO_2$/kWh (flour industry). One industry reported that the adoption of new technologies and the construction of new energy-efficient ships or the deployment of low carbon emission fuels replacing heavy oil were not progressing and that slow navigation is difficult because ships are operated in accordance with customer needs (domestic shipping industry).

Industries that underachieved their targets mentioned the measures they would take in Phase II (fiscal 2030). One industry reported that it had continued to invest in energy conservation and $CO_2$ emission reductions that have been successful and planning further medium- to long-term investments (lime production industry). Another industry reported that it would engage in technological innovation (introduction of new aircraft models), improve flight operations, and promote the introduction of sustainable aviation fuels (SAF).

## Table 12. Achievement rate of Phase I (fiscal 2020) targets[*1]

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Achieved | Industrial | ☆ | Limestone Association of Japan | 299% | Liaison Group of Japanese Electrical and Electronics Industries for Global Warming Prevention | 361% |
| | | ☆ | Japan Iron and Steel Federation | 216% | | |
| | | ★ | Japan Aluminium Association | 184% | Brewers Association of Japan | 317% |
| | | ☆★ | Japan Dairy Industry Association | 157% | Japan Paper Association | 255% |
| | | ★ | Japanese Electric Wire & Cable Makers' Association | 149% | Japan Soft Drink Association | 211% |
| | | ☆ | Japan Automobile Manufacturers Association/ Japan Auto-Bodies Industries Association | 135% | Japan Society of Industrial Machinery Manufacturers | 200% |
| | | | | | Japan Mining Industry Association | 176% |
| | | ★ | Japan Federation of Printing Industries | 129% | Japan Federation of Housing Organizations | 127% |
| | | ★ | Japan Sanitary Equipment Industry Association | 127% | Japan Industrial Vehicles Association | 124% |
| | | ★ | Flat Glass Manufacturers Association of Japan | 118% | Japan Bearing Industrial Association | 108% |
| | | ☆ | Japan Petroleum Development Association | 100% | Japan Federation of Construction Contractors | 118% |
| | | | Japan Cement Association | 480% | Japan Association of Rolling Stock Industries | 112% |
| | | | | | Federation of Pharmaceutical Manufacturers' Associations of Japan | 103% |
| | Energy conversion | ☆ | Japan Gas Association | 102% | Petroleum Association of Japan | 123% |
| | | | Electric Power Council for a Low Carbon Society | 151% | | |
| | Commercial | ★ | Japan Foreign Trade Council | 380% | General Insurance Association of Japan | 270% |
| | | ★ | Japan Franchise Association | 124% | Life Insurance Association of Japan | 256% |
| | | ☆ | Telecommunications Carriers Association | 107% | Japan LP Gas Association | 145% |
| | | | Japan Internet Providers Association | 2393% | Japan Building Owners and Managers Association | 145% |
| | | | Japan Securities Dealers Association | 370% | Telecom Services Association | 133% |
| | | | Japan Department Stores Association | 354% | Real Estate Companies Association of Japan | 126% |
| | | | Japan Hotel Association | 294% | Japan Association of Refrigerated Warehouses | 125% |
| | | | Japan Bankers Association | 289% | Japan Chain Stores Association | 106% |
| | Transportation | | Japanese Shipowners' Association | 176% | All Japan Freight Forwarders Association | 167% |
| | | | Association of Japanese Private Railways | 212% | East Japan Railway Company | 137% |
| | | | Shikoku Railway Company | 170% | | |
| Partly achieved | Industrial | | Shipbuilders' Association of Japan & Cooperative Association of Japan Shipbuilders (top: hours, bottom: quantity at completion) | 227% -105% | | |
| Underachieved[*2] | Industrial | ★ | Japan Copper and Brass Association | 56% (97%) | Japan Chemical Industry Association | 60% (284%) |
| | | | Japan Machine Tool Builders' Association | 73% (331%) | Japan Auto Parts Industries Association | 57% (106%) |
| | | | Flour Millers Association | 62% (N.A.) | Japan Lime Association | 55% (147%) |
| | | | | | Japan Rubber Manufacturers Association | 41% (120%) |
| | Transportation | | Japan Federation of Coastal Shipping Associa | 72% (59%) | Japan Trucking Association | -13% (45%) |
| | | | Scheduled Airlines Association of Japan | -6% (84%) | | |

☆: Industries that renewed their targets in the fiscal 2016 interim review
★: Industries that renewed their targets after the interim Review (fiscal 2017, 2018, 2019, 2020)
*1 For industries that have renewed targets, the rate of progress against new targets are provided.
*2 For industries that underachieved their targets, performance levels for fiscal 2020 are given in the first row and performance levels for fiscal 2019, when the impact of COVID-19 can be assumed to be smaller, are given in round brackets in the second row.

- The formula for calculating the status of progress is provided below:

  Rate of progress (target against baseline year) = ([performance in baseline year] – [performance in current year]) / ([performance in baseline year]– [fiscal 2020 target]) ×100(%)

  Rate of progress (target against BAU) = ([BAU level for current year] – [performance in current year]) / [fiscal 2020 target] ×100(%)
- The table does not include West Japan Railway Company, Central Japan Railway Company, Kyushu Railway Company, and Japan Freight Railway Company.

### 3. Status of reviewing Phase II target and rate of progress

Participating industries continue to pursue the targets they have individually set up for Phase II (fiscal 2030).

In terms of rate of progress, 25 industries have already achieved their Phase II (fiscal 2030) targets in the fiscal 2021 follow-up. Industries that have achieved their goals and a few others have renewed their targets to higher levels. As of the previous fiscal year 27 industries had renewed their targets. In the fiscal 2021 follow-up, 12 industries renewed their targets, 13 industries were revisiting their targets or were planning to consider new targets (Table 13).

Industries that have overachieved their goals but have nevertheless kept their original targets reported that they need to verify their performance in the next fiscal year and carefully determine whether they would be able to renew their targets.

Keidanren will call upon participating industries to make consistent efforts to review their targets as they engage in continued reduction efforts by maximizing the introduction of BAT and seek to further their efforts in technology development and deployment.

**Table 13. Status of review of Phase II (fiscal 2030) targets and rate of progress in fiscal 2020**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Industries with renewed targets※ | Industrial | ★ | Japan Society of Industrial Machinery Manufacturers | 219% | ◎ | Japan Iron and Steel Federation | 83% |
| | | ★ | Japan Aluminium Association | 153% | ◎ | Japan Dairy Industry Association | 83% |
| | | ★◎ | Japan Cement Association | 150% | ★ | Federation of Pharmaceutical Manufacturers' Associations of Japan | 79% |
| | | ★ | Japanese Electric Wire & Cable Makers' Association | 131% | ☆ | Flour Millers Association | 77% |
| | | ☆ | Japan Automobile Manufacturers Association/ Japan Auto-Bodies Industries Association | 126% | ★◎ | Limestone Association of Japan | 77% |
| | | | | | ◎ | Japan Rubber Manufacturers Association | 76% |
| | | ★* | Japan Sanitary Equipment Industry Association | 115% | ★ | Japan Paper Association | 67% |
| | | ★ | Japan Industrial Vehicles Association | 113% | ☆ | Japan Copper and Brass Association | 38% |
| | | ★ | Brewers Association of Japan | 111% | ★◎ | Japan Petroleum Development Association | 27% |
| | | ★* | Japan Mining Industry Association | 101% | ★ | Japan Machine Tool Builders' Association | 34% |
| | | ★ | Japan Federation of Printing Industries | 99% | ★ | Japan Chemical Industry Association | -11% |
| | | ★ | Flat Glass Manufacturers Association of Japan | 94% | | (top: BAU, bottom: absolute amount) | 129% |
| | | ★◎ | Japan Auto Parts Industries Association | 92% | ★◎ | Liaison Group of Japanese Electrical and Electronics Industries for Global Warming Prevention | 0% |
| | Energy conversion | ☆ | Japan Gas Association | 103% | | | |
| | Commercial | ★* | Japan Foreign Trade Council | 164% | ★ | Life Insurance Association of Japan | 86% |
| | | ◎* | Real Estate Companies Association of Japan | 105% | ◎ | General Insurance Association of Japan | 68% |
| | | ☆ | Telecommunications Carriers Association | 95% | ★* | Japan Franchise Association | 54% |
| | | ◎ | Japan Department Stores Association | 91% | | | |
| | | | (top: intensity, bottom: absolute amount) | 108% | | | |
| | Transportation | ★ | East Japan Railway Company | 22% | ◎ | Scheduled Airlines Association of Japan | 5% |
| Considering renewal of target | Industrial | | Shipbuilders' Association of Japan & Cooperative Association of Japan Shipbuilders | 279% | | | |
| | Commercial | | Telecom Services Association | 273% | | Japan Bankers Association | 160% |
| | | | Japan Securities Dealers Association | 185% | | Japan Building Owners and Managers Association | 109% |
| | | | | | | Japan Chain Stores Association | 106% |
| | Transportation | | Japanese Shipowners' Association | 117% | | Association of Japanese Private Railways | 212% |

☆: Industries that renewed their targets in the fiscal 2016 interim review

★: Industries that renewed their targets after the interim Review (fiscal 2017, 2018, 2019, 2020)

◎: Industries that renewed their targets in the fiscal 2021 follow-up

*: Industries that have renewed their targets and plan to renew their targets again.

※ For industries that have renewed targets, the rate of progress against new targets are provided. Some industries plan to verify the appropriateness of their targets based on the achievement status of Phase I (fiscal 2020) targets.

## 4. Notable measures and major products and technologies developed and deployed in Phase I that contributed to emission reductions

During Phase I, each industry engaged in emission reduction efforts based on four pillars: emission reductions from domestic business operations (Pillar 1); strengthening cooperation with other interested groups (Pillar 2); promoting contribution at the international level (Pillar 3); and development of innovative technologies (Pillar 4).

# Conclusion

In November 2021, Keidanren published ".The NEW Growth Strategy"[14] and referred to "sustainable capitalism" as a new form of capitalism.

Climate change is an urgent challenge in our pursuit of sustainable capitalism. Keidanren believes that we need to proactively engage in global warming countermeasures and lead these actions to economic growth, with a view to achieving green transformation (GX), which will fundamentally transform the entire society and economy.

The CN Action Plan bears the central role of delivering the proactive approaches taken by the business community toward GX.

In the current follow-up survey, all industries reported that they had either already formulated or were considering/planning to consider their visions (basic policy, etc.) toward CN by 2050. Each industry is drawing a roadmap under which they are advancing measure to develop and socially implement innovative technologies that will significantly reduce emissions.

During the seven years from fiscal 2013 through fiscal 2020 (Phase I), the four sectors collectively succeeded in reducing $CO_2$ emissions by 21.6% (industrial: 20.8%; energy conversion: 23.3%[15]; commercial: 35.1%; transportation: 21.0%). Emissions attributable to strengthening cooperation with other interested groups and promoting contribution at the international level were increasingly visualized, revealing successful results.

The CN Action Plan is no longer just a collection of voluntary approaches. A scheme to guarantee the reliability and transparency of the action plans has been established through strict annual follow-ups conducted by Keidanren's Third Party Evaluation Committee and Government councils. Therefore, we can say that it functions as a social system.

Under the CN Action Plan, Keidanren will accelerate its proactive approaches throughout Phase II not only to reduce emissions from domestic business operations but also to collaborate with various actors to achieve carbon neutrality on a global scale across the global value chain.

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[14] Keidanren, ". The NEW Growth Strategy" (November 2020) https://www.keidanren.or.jp/en/policy/2020/108.html

[15] Calculated based on $CO_2$ emissions after electric power distribution (reference value)

〔Attachment 1〕

# Vision of industries toward carbon neutrality by 2050 (basic policy, etc.)

(*: Japanese Document)

1. Industrial sector

(1) The Japan Iron and Steel Federation
"Basic Policy of the Japan steel industry on 2050 Carbon Neutrality aimed by the Japanese government" (February. 2021)

(2) Japan Chemical Industry Association
"Chemical Industry's Stance on Carbon Neutrality" (May 2021)

(3) Japan Paper Association
https://www.jpa.gr.jp/topics/nr.php?topicsid=66 * (January 2021)

(4) Liaison Group of Japanese Electrical and Electronics Industries for Global Warming Prevention
"Long-Term Strategy on Climate Change" (January 2020)

(5) Japan Automobile Manufacturers Association / Japan Auto-Bodies Industries Association
https://www.jama.or.jp/operation/ecology/carbon_neutral_data/pdf/CNMaterial_02.pdf * (April 2021)

(6) Japan Mining Industry Association
https://www.kogyo-kyokai.gr.jp/image/20210618_2050C7AFA5ABA1BCA5DCA5F3A5CBA5E5A1BCA5C8A5E9A5EBBCC2B8BDA4CBB8FEA4B1A4BFC8F3C5B4B6E2C2B0B6C8B3A6A4CEBCE8A4EAC1C8A4DFA4CBA4C4A4A4A4C6.pdf * (June 2021)

(7) Japan Federation of Construction Contractors
https://www.nikkenren.com/kankyou/lowcarbon/ * (April 2021)

(8) The Japan Rubber Manufacturers Association
https://www.rubber.or.jp/kanri/download.php?file=page2.1.51.pdf&org=vision_2050-20220106.pdf * (January 2022)

(9) Japan Aluminium Association
https://www.aluminum.or.jp/sys_img/files/1641517265_0.pdf * (January 2022)

(10) Japan Petroleum Development Association
http://www.sekkoren.jp/pdf/climate_change.pdf * (March 2021)

2. Energy conversion sector

(1) The Electric Power Council for a Low Carbon Society (ELCS)
"The contribution of ELCS to achieving Carbon Neutrality in 2050" * (October 2021)

(2) Petroleum Association of Japan
"A vision toward carbon neutrality in the Japanese refining industry" * (March 2021)

(3) The Japan Gas Association
"Carbon Neutral Challenge 2050 Action Plan" (November 2021)

3. Commercial sector

(1) Japan Franchise Association
No URL (September 2021)

(2) Japan Bankers Association
https://www.zenginkyo.or.jp/abstract/efforts/contribution/csr/environment/environment02/ *
(December 2018)

(3) The Life Insurance Association of Japan
"Action guidelines for environmental issues" and "an action plan for carbon neutrality" *
(September 2021)

(4) Japan Foreign Trade Council
"Long-term Vision for Climate Change Measures" * (March 2020)

(5) The General Insurance Association of Japan
"Position Statement on Climate Change" (July 2021)

(6) The Real Estate Companies Association of Japan
https://www.fdk.or.jp/f_suggestion/pdf/kankyou_jikkou_tyoki_2_2104.pdf * (April 2021)

(7) Japan Building Owners and Managers Association
http://www.jboma.or.jp/wp/wp-content/uploads/2021/03/5c958f0e5034f14e03be4d1b5111e80b.pdf *
(April 2021)

(8) Japan Securities Dealers Association
https://www.jsda.or.jp/sdgs/files/20190219_koudoukeikaku.pdf * (February 2019)

4. Transportation sector

(1) The Japanese Shipowners' Association
Challenge of 2050 Net Zero GHG (October 2021)

(2) The Scheduled Airlines Association of Japan
http://teikokyo.gr.jp/pressrelease/776/#section-1 * (November 2021)

(3) East Japan Railway Company
Zero Carbon Challenge 2050 (May 2020)

## Industry-specific trends in each sector (*1)

1. Industrial Sector

10,000t-$CO_2$; 10,000kl crude oil equivalent; fiscal year

| Industry | (*2) (☆: target adopted by the industry) | Notes | 1990 | 2005 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Relative to FY2005 | Relative to FY2013 | Relative to previous FY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| The Japan Iron and Steel Federation | CO2 emissions (actual emissions) | | 20,231 | 18,847 | 16,805 | 18,917 | 18,631 | 18,989 | 19,443 | 19,175 | 18,427 | 18,279 | 18,130 | 17,725 | 17,269 | 14,596 | -22.6% | -24.9% | -15.5% |
| | CO2 emissions (post-adjustment) ☆ | | 20,231 | 18,847 | 16,647 | 18,721 | 18,523 | 18,714 | 19,441 | 19,163 | 18,408 | 18,264 | 18,122 | 17,723 | 17,262 | 14,593 | -22.6% | -24.9% | -15.5% |
| | CO2 emission intensity index (actual emissions) | | 1.00 | 0.90 | 0.93 | 0.91 | 0.94 | 0.95 | 0.93 | 0.93 | 0.94 | 0.93 | 0.93 | 0.93 | 0.94 | 0.95 | 5.1% | 2.2% | 0.6% |
| | CO2 emission intensity index (post-adjustment) | | 1.00 | 0.90 | 0.92 | 0.90 | 0.93 | 0.93 | 0.93 | 0.93 | 0.94 | 0.93 | 0.93 | 0.93 | 0.94 | 0.95 | 5.0% | 2.2% | 0.7% |
| | Energy consumption | | 6,371 | 5,902 | 5,261 | 5,933 | 5,776 | 5,813 | 5,937 | 5,858 | 5,638 | 5,619 | 5,570 | 5,491 | 5,341 | 4,551 | -22.9% | -23.3% | -14.8% |
| | Energy consumption intensity index | | 1.00 | 0.90 | 0.92 | 0.91 | 0.92 | 0.92 | 0.90 | 0.90 | 0.92 | 0.91 | 0.90 | 0.91 | 0.93 | 0.94 | 4.6% | 4.3% | 1.4% |
| | Production activity index | | 1.00 | 1.03 | 0.90 | 1.03 | 0.98 | 0.99 | 1.04 | 1.02 | 0.97 | 0.97 | 0.97 | 0.95 | 0.91 | 0.76 | -26.3% | -26.5% | -16.0% |
| Japan Chemical Industry Association | CO2 emissions (actual emissions) | | 3,395 | 6,857 | 6,216 | 6,424 | 6,335 | 6,249 | 6,364 | 6,267 | 6,129 | 5,967 | 6,022 | 5,852 | 5,774 | 5,481 | -20.1% | -13.9% | -5.1% |
| | CO2 emissions (post-adjustment) ☆ | | 3,395 | 6,857 | 6,049 | 6,236 | 6,236 | 5,999 | 6,364 | 6,264 | 6,121 | 5,961 | 6,019 | 5,858 | 5,777 | 5,489 | -19.9% | -13.7% | -5.0% |
| | CO2 emission intensity index (actual emissions) | Base year: FY2005 | | 1.00 | 1.00 | 1.00 | 1.04 | 1.07 | 1.04 | 1.05 | 1.01 | 1.00 | 0.96 | 0.94 | 0.94 | 0.99 | -1.0% | -5.0% | 5.3% |
| | CO2 emission intensity index (post-adjustment) | | | 1.00 | 0.97 | 0.97 | 1.02 | 1.02 | 1.04 | 1.05 | 1.01 | 1.00 | 0.96 | 0.94 | 0.94 | 0.99 | -0.9% | -4.8% | 5.4% |
| | CO2 emission intensity index (actual emissions) | Base year: FY2013 | | | | | | | 1.00 | 1.01 | 0.97 | 0.96 | 0.92 | 0.90 | 0.90 | 0.95 | | -4.8% | 5.5% |
| | CO2 emission intensity index (post-adjustment) | | | | | | | | 1.00 | 1.01 | 0.97 | 0.96 | 0.92 | 0.91 | 0.90 | 0.95 | | -4.7% | 5.6% |
| | Energy consumption | | 1,442 | 2,924 | 2,679 | 2,789 | 2,631 | 2,529 | 2,563 | 2,536 | 2,517 | 2,468 | 2,526 | 2,489 | 2,473 | 2,358 | -19.3% | -8.0% | -4.6% |
| | Energy consumption intensity index | Base year: FY2005 | | 1.00 | 1.01 | 1.02 | 1.01 | 1.01 | 0.98 | 0.99 | 0.97 | 0.97 | 0.95 | 0.94 | 0.94 | 1.00 | -0.1% | 1.5% | 5.8% |
| | Production activity index | | | 1.00 | 0.91 | 0.93 | 0.89 | 0.85 | 0.89 | 0.87 | 0.88 | 0.87 | 0.91 | 0.91 | 0.90 | 0.81 | -19.2% | -9.3% | -9.9% |
| | Energy consumption intensity index | Base year: FY2013 | | | | | | | 1.00 | 1.01 | 0.99 | 0.98 | 0.96 | 0.96 | 0.96 | 1.02 | | 1.7% | 6.0% |
| | Production activity index | | | | | | | | 1.00 | 0.98 | 0.99 | 0.98 | 1.03 | 1.02 | 1.01 | 0.90 | | -9.5% | -10.0% |
| Japan Paper Association | CO2 emissions (actual emissions) | | 2,582 | 2,519 | 1,984 | 1,911 | 1,895 | 1,867 | 1,880 | 1,813 | 1,791 | 1,804 | 1,780 | 1,741 | 1,657 | 1,559 | -38.1% | -17.1% | -5.9% |
| | CO2 emissions (post-adjustment) ☆ | | 2,582 | 2,519 | 1,949 | 1,873 | 1,875 | 1,821 | 1,880 | 1,813 | 1,789 | 1,804 | 1,780 | 1,742 | 1,657 | 1,560 | -38.1% | -17.0% | -5.8% |
| | CO2 emission intensity index (actual emissions) | Base year: FY2005 | 1.14 | 1.00 | 0.91 | 0.86 | 0.89 | 0.89 | 0.87 | 0.84 | 0.84 | 0.84 | 0.82 | 0.81 | 0.80 | 0.84 | -16.3% | -3.2% | 4.3% |
| | CO2 emission intensity index (post-adjustment) | | 1.14 | 1.00 | 0.89 | 0.84 | 0.88 | 0.87 | 0.87 | 0.84 | 0.84 | 0.84 | 0.82 | 0.81 | 0.80 | 0.84 | -16.2% | -3.2% | 4.3% |
| | Energy consumption | | 967 | 899 | 708 | 689 | 660 | 632 | 632 | 612 | 602 | 606 | 601 | 594 | 568 | 533 | -40.6% | -15.6% | -6.1% |
| | Energy consumption intensity index | Base year: FY2005 | 1.19 | 1.00 | 0.91 | 0.87 | 0.86 | 0.85 | 0.82 | 0.80 | 0.79 | 0.79 | 0.78 | 0.77 | 0.77 | 0.80 | -19.7% | -1.6% | 4.0% |
| | Production activity index | | 0.90 | 1.00 | 0.87 | 0.88 | 0.85 | 0.83 | 0.86 | 0.85 | 0.85 | 0.85 | 0.86 | 0.85 | 0.82 | 0.74 | -26.1% | -14.3% | -9.8% |
| Liaison Group of Japanese Electrical and Electronics Industries for Global Warming Prevention *3 | CO2 emissions (actual emissions) | | 1,111 | 1,813 | 1,675 | 1,660 | 1,804 | 1,343 | 1,297 | 1,336 | 1,350 | 1,405 | 1,444 | 1,335 | 1,297 | 1,169 | -35.5% | -9.8% | -9.8% |
| | CO2 emissions (post-adjustment) | | 1,111 | 1,813 | 1,480 | 1,461 | 1,704 | 1,169 | 1,297 | 1,334 | 1,344 | 1,400 | 1,441 | 1,340 | 1,299 | 1,176 | -35.1% | -9.3% | -9.5% |
| | Energy consumption | | 645 | 994 | 963 | 956 | 875 | 597 | 571 | 601 | 625 | 666 | 708 | 691 | 695 | 634 | -36.2% | 11.1% | -8.7% |
| | Energy consumption intensity index (reference value) | | | | | | | 1.00 | 0.93 | 0.89 | 0.91 | 0.88 | 0.91 | 0.90 | 0.94 | 0.93 | | 0.5% | -1.3% |
| | Energy consumption intensity target index ☆ | Base year: FY2012 | | | | | | 1.00 | 0.93 | 0.89 | 0.89 | 0.87 | 0.80 | 0.75 | 0.77 | 0.72 | | -22.4% | -6.1% |
| | Production activity index | | | | | | | 1.00 | 1.03 | 1.13 | 1.15 | 1.26 | 1.30 | 1.29 | 1.23 | 1.14 | | 10.6% | -7.5% |
| Japan Cement Association | CO2 emissions (actual emissions) | | 2,762 | 2,185 | 1,756 | 1,662 | 1,712 | 1,769 | 1,806 | 1,775 | 1,718 | 1,696 | 1,732 | 1,685 | 1,614 | 1,551 | -29.0% | -14.2% | -3.9% |
| | CO2 emissions (post-adjustment) | | 2,762 | 2,185 | 1,744 | 1,650 | 1,704 | 1,749 | 1,806 | 1,774 | 1,718 | 1,696 | 1,732 | 1,686 | 1,614 | 1,551 | -29.0% | -14.1% | -3.9% |
| | CO2 emission intensity index (actual emissions) | Base year: FY2010 | 1.00 | 0.99 | 1.01 | 1.00 | 1.00 | 1.00 | 0.98 | 0.98 | 0.98 | 0.97 | 0.97 | 0.94 | 0.94 | 0.93 | -6.1% | -4.4% | -0.3% |
| | CO2 emission intensity index (post-adjustment) | | 1.01 | 1.00 | 1.01 | 1.00 | 1.01 | 1.00 | 0.98 | 0.99 | 0.99 | 0.97 | 0.97 | 0.95 | 0.94 | 0.94 | -6.1% | -4.4% | -0.3% |
| | Energy consumption | | 874 | 656 | 525 | 499 | 510 | 523 | 541 | 532 | 515 | 510 | 522 | 512 | 491 | 472 | -28.0% | -12.7% | -3.8% |
| | Energy consumption intensity index ☆ | Base year: FY2010 | 1.05 | 0.99 | 1.01 | 1.00 | 0.99 | 0.99 | 0.97 | 0.98 | 0.98 | 0.97 | 0.97 | 0.95 | 0.95 | 0.95 | -4.7% | -2.8% | -0.2% |
| | Production activity index | | 1.67 | 1.32 | 1.04 | 1.00 | 1.03 | 1.06 | 1.11 | 1.09 | 1.06 | 1.06 | 1.08 | 1.07 | 1.04 | 1.00 | -24.4% | -10.2% | -3.6% |
| Japan Automobile Manufacturers Association, Inc. / Japan Auto-Body Industries Association, Inc. | CO2 emissions (actual emissions) | | 990 | 802 | 588 | 616 | 652 | 738 | 747 | 716 | 666 | 671 | 661 | 623 | 582 | 520 | -35.2% | -30.5% | -10.7% |
| | CO2 emissions (post-adjustment) ☆ | | 990 | 802 | 542 | 566 | 626 | 667 | 747 | 715 | 663 | 669 | 661 | 624 | 583 | 522 | -35.0% | -30.2% | -10.5% |
| | CO2 emission intensity index (actual emissions) | Base year: FY1990 | 1.00 | 0.76 | 0.69 | 0.69 | 0.71 | 0.77 | 0.70 | 0.66 | 0.59 | 0.60 | 0.56 | 0.53 | 0.50 | 0.53 | -30.5% | -25.3% | -5.5% |
| | CO2 emission intensity index (post-adjustment) | | 1.00 | 0.76 | 0.64 | 0.63 | 0.69 | 0.70 | 0.70 | 0.66 | 0.59 | 0.60 | 0.56 | 0.53 | 0.50 | 0.53 | -30.2% | -25.0% | -5.7% |
| | Energy consumption | | 496 | 398 | 317 | 332 | 313 | 332 | 333 | 324 | 308 | 317 | 321 | 314 | 300 | 271 | -31.9% | -18.7% | -9.7% |
| | Energy consumption intensity index | Base year: FY1990 | 1.00 | 0.75 | 0.75 | 0.74 | 0.68 | 0.69 | 0.63 | 0.60 | 0.55 | 0.56 | 0.54 | 0.53 | 0.51 | 0.55 | -26.8% | -12.7% | 6.6% |
| | Production activity index | | 1.00 | 1.07 | 0.86 | 0.91 | 0.92 | 0.97 | 1.07 | 1.10 | 1.13 | 1.13 | 1.19 | 1.20 | 1.18 | 1.00 | -6.9% | -6.9% | -15.3% |
| Japan Auto Parts Industries Association | CO2 emissions (actual emissions) | | 764 | 745 | 548 | 599 | 680 | 757 | 771 | 745 | 689 | 700 | 700 | 648 | 618 | 567 | -23.9% | -26.5% | -8.3% |
| | CO2 emissions (post-adjustment) | | 764 | 745 | 497 | 542 | 648 | 671 | 771 | 744 | 686 | 698 | 699 | 650 | 619 | 569 | -23.6% | -26.1% | -8.0% |
| | CO2 emission intensity index (actual emissions) ☆ | Base year: FY1990 | 1.48 | 1.15 | 0.86 | 0.87 | 0.96 | 1.03 | 1.02 | 1.01 | 0.97 | 0.97 | 0.93 | 0.85 | 0.85 | 0.90 | -21.8% | -11.9% | 6.2% |
| | CO2 emission intensity index (post-adjustment) | | 1.48 | 1.15 | 0.78 | 0.79 | 0.92 | 0.92 | 1.02 | 1.01 | 0.96 | 0.96 | 0.93 | 0.85 | 0.85 | 0.90 | -21.5% | -11.5% | 6.5% |
| | Energy consumption | | 401 | 384 | 298 | 327 | 323 | 333 | 337 | 334 | 316 | 329 | 338 | 329 | 323 | 300 | -21.9% | -11.0% | -7.1% |
| | Energy consumption intensity index | Base year: FY1990 | 1.54 | 1.18 | 0.93 | 0.94 | 0.91 | 0.90 | 0.89 | 0.90 | 0.88 | 0.90 | 0.89 | 0.86 | 0.88 | 0.94 | -19.8% | 6.7% | 7.5% |
| | Production activity index | | 0.66 | 0.82 | 0.81 | 0.87 | 0.90 | 0.93 | 0.96 | 0.93 | 0.90 | 0.92 | 0.96 | 0.97 | 0.92 | 0.80 | -2.7% | -16.6% | -13.6% |
| Japan Mining Industry Association | CO2 emissions (actual emissions) | | 411 | 396 | 377 | 374 | 408 | 443 | 449 | 441 | 405 | 369 | 362 | 340 | 330 | 319 | -19.4% | -29.0% | -3.4% |
| | CO2 emissions (post-adjustment) | | 411 | 396 | 352 | 349 | 394 | 406 | 449 | 441 | 404 | 368 | 361 | 341 | 331 | 320 | -19.1% | -28.7% | -3.2% |
| | CO2 emission intensity index (actual emissions) ☆ | Base year: FY1990 | 1.00 | 0.84 | 0.81 | 0.79 | 0.92 | 0.92 | 0.94 | 0.89 | 0.85 | 0.79 | 0.78 | 0.72 | 0.71 | 0.69 | -18.0% | -26.4% | -3.1% |
| | CO2 emission intensity index (post-adjustment) | | 1.00 | 0.84 | 0.76 | 0.74 | 0.88 | 0.84 | 0.94 | 0.89 | 0.85 | 0.79 | 0.78 | 0.72 | 0.71 | 0.69 | -17.7% | -26.1% | -2.8% |
| | Energy consumption | | 170 | 161 | 161 | 161 | 159 | 162 | 163 | 163 | 154 | 144 | 144 | 142 | 141 | 137 | -14.8% | -15.6% | -2.2% |
| | Energy consumption intensity index | Base year: FY1990 | 1.00 | 0.83 | 0.84 | 0.83 | 0.86 | 0.82 | 0.82 | 0.80 | 0.79 | 0.75 | 0.75 | 0.73 | 0.73 | 0.72 | -13.3% | -12.6% | -1.9% |
| | Production activity index | | 1.00 | 1.14 | 1.13 | 1.15 | 1.09 | 1.17 | 1.16 | 1.20 | 1.16 | 1.14 | 1.13 | 1.15 | 1.13 | 1.12 | -1.7% | -3.5% | -0.4% |
| Japan Federation of Construction Contractors | CO2 emissions (actual emissions) | | 249 | 532 | 462 | 316 | 398 | 402 | 411 | 438 | 431 | 421 | 412 | 429 | 445 | 393 | -26.1% | -4.3% | -11.5% |
| | CO2 emissions (post-adjustment) | | 249 | 532 | 450 | 315 | 391 | 387 | 411 | 438 | 431 | 420 | 412 | 430 | 445 | 394 | -26.0% | -4.1% | -11.4% |
| | CO2 emission intensity index (actual emissions) ☆ | Base year: FY1990 | 1.00 | 3.32 | 3.36 | 2.66 | 3.36 | 3.28 | 3.12 | 3.14 | 3.10 | 3.05 | 3.04 | 3.02 | 2.96 | 2.81 | -15.4% | -9.9% | -5.1% |
| | CO2 emission intensity index (post-adjustment) | | 1.00 | 3.32 | 3.26 | 2.64 | 3.30 | 3.17 | 3.12 | 3.13 | 3.10 | 3.05 | 3.04 | 3.03 | 2.96 | 2.81 | -15.2% | -9.7% | -5.0% |
| | Energy consumption | | 160 | 229 | 193 | 121 | 162 | 157 | 159 | 170 | 168 | 166 | 164 | 174 | 183 | 162 | -29.2% | 2.4% | -11.5% |
| | Energy consumption intensity index | Base year: FY1990 | 1.00 | 2.22 | 2.18 | 1.58 | 2.13 | 1.99 | 1.87 | 1.89 | 1.89 | 1.88 | 1.88 | 1.91 | 1.90 | 1.80 | -18.9% | -3.6% | -5.0% |
| | Production activity index | | 1.00 | 0.64 | 0.55 | 0.48 | 0.48 | 0.49 | 0.53 | 0.56 | 0.56 | 0.55 | 0.55 | 0.57 | 0.60 | 0.56 | -12.7% | 6.2% | -6.8% |
| Japan Federation of Housing Organizations | CO2 emissions (actual emissions) | | 538 | | 235 | 240 | 245 | 262 | 260 | 240 | 239 | 242 | 228 | 211 | 206 | 198 | | -24.0% | -3.8% |
| | CO2 emissions (post-adjustment) | | 538 | | 235 | 240 | 245 | 262 | 260 | 240 | 239 | 242 | 228 | 211 | 206 | 198 | | -24.0% | -3.8% |
| | CO2 emission intensity index (actual emissions) | | 1.00 | | 0.87 | 0.81 | 0.81 | 0.82 | 0.74 | 0.81 | 0.79 | 0.77 | 0.75 | 0.69 | 0.70 | 0.75 | | 0.1% | 6.0% |
| | CO2 emission intensity index (post-adjustment) | | 1.00 | | 0.87 | 0.81 | 0.81 | 0.82 | 0.74 | 0.81 | 0.79 | 0.77 | 0.75 | 0.69 | 0.70 | 0.75 | | 0.1% | 6.0% |
| | Energy consumption | | | | 90 | 92 | 94 | 101 | 100 | 92 | 92 | 93 | 89 | 87 | 85 | 82 | | -18.2% | -3.8% |
| | Energy consumption intensity index | | | | | | | | | | | | | | | | | | |
| | Production activity index | | 1.00 | | 0.50 | 0.55 | 0.56 | 0.59 | 0.65 | 0.55 | 0.56 | 0.59 | 0.56 | 0.57 | 0.54 | 0.49 | | -24.1% | -9.3% |

| Industry | (*2) （☆:target adopted by the industry） | Notes | 1990 | 2005 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Relative to FY2005 | Relative to FY2013 | Relative to previous FY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lime Manufacture Association | CO2 emissions (actual emissions) ☆ | | 357 | 308 | 244 | 268 | 234 | 227 | 246 | 246 | 223 | 225 | 227 | 223 | 210 | 176 | -42.8% | -28.6% | -16.2% |
| | CO2 emissions (post-adjustment) | | 357 | 308 | 241 | 265 | 232 | 223 | 246 | 246 | 223 | 225 | 227 | 223 | 210 | 176 | -42.8% | -28.5% | -16.1% |
| | CO2 emission intensity index (actual emissions) | | 1.00 | 0.86 | 0.78 | 0.76 | 0.74 | 0.76 | 0.78 | 0.78 | 0.76 | 0.74 | 0.73 | 0.71 | 0.71 | 0.70 | -19.0% | -10.1% | -1.9% |
| | CO2 emission intensity index (post-adjustment) | | 1.00 | 0.86 | 0.77 | 0.75 | 0.74 | 0.74 | 0.78 | 0.78 | 0.76 | 0.74 | 0.73 | 0.71 | 0.71 | 0.70 | -18.9% | -10.0% | -1.9% |
| | Energy consumption | | 123 | 106 | 87 | 96 | 83 | 79 | 84 | 84 | 76 | 78 | 80 | 80 | 75 | 64 | -39.9% | -24.7% | -15.7% |
| | Energy consumption intensity index | | 1.00 | 0.86 | 0.81 | 0.79 | 0.76 | 0.77 | 0.77 | 0.77 | 0.75 | 0.74 | 0.75 | 0.74 | 0.74 | 0.73 | -14.8% | -5.2% | -1.4% |
| | Production activity index | | 1.00 | 1.00 | 0.88 | 0.99 | 0.88 | 0.84 | 0.89 | 0.89 | 0.83 | 0.85 | 0.87 | 0.88 | 0.82 | 0.71 | -29.4% | -20.5% | -14.5% |
| The Japan Rubber Manufacturers Association*4 | CO2 emissions (actual emissions) | | | 236 | 193 | 204 | 224 | 223 | 222 | 215 | 204 | 196 | 190 | 181 | 168 | 157 | -33.6% | -29.2% | -6.7% |
| | CO2 emissions (post-adjustment) | | | 236 | 182 | 192 | 217 | 206 | 222 | 215 | 203 | 196 | 190 | 181 | 168 | 157 | -33.4% | -29.0% | -6.6% |
| | CO2 emission intensity index (actual emissions) ☆ | Base year: FY2005 | | 1.00 | 1.02 | 0.94 | 1.02 | 1.09 | 1.06 | 1.05 | 1.06 | 1.04 | 0.99 | 0.93 | 0.88 | 0.99 | -1.0% | -6.8% | 12.0% |
| | CO2 emission intensity index (post-adjustment) | | | 1.00 | 0.96 | 0.89 | 0.99 | 1.01 | 1.06 | 1.05 | 1.06 | 1.04 | 0.99 | 0.93 | 0.88 | 0.99 | -0.7% | -6.6% | 12.2% |
| | Energy consumption | | | 112 | 98 | 105 | 105 | 100 | 99 | 97 | 94 | 91 | 90 | 90 | 86 | 81 | -28.1% | -18.0% | -6.3% |
| | Energy consumption intensity index | Baae year: FY2005 | | 1.00 | 1.09 | 1.01 | 1.00 | 1.03 | 0.99 | 1.00 | 1.03 | 1.02 | 0.99 | 0.97 | 0.95 | 1.07 | 7.2% | 8.0% | 12.6% |
| | Production activity index | | | 1.00 | 0.80 | 0.92 | 0.93 | 0.86 | 0.88 | 0.86 | 0.81 | 0.80 | 0.81 | 0.82 | 0.81 | 0.67 | -32.9% | -24.1% | -16.7% |
| The Federation of Pharmaceutical Manufacturers' Associations of Japan | CO2 emissions (actual emissions) ☆ | | 159 | 232 | 201 | 201 | 224 | 245 | 256 | 247 | 242 | 244 | 235 | 219 | 213 | 205 | -11.5% | -20.0% | -3.8% |
| | CO2 emissions (post-adjustment) | | 159 | 232 | 186 | 186 | 215 | 223 | 256 | 247 | 241 | 243 | 235 | 220 | 213 | 206 | -11.1% | -19.7% | -3.5% |
| | CO2 emission intensity index (actual emissions) | Base year: FY2005 | 1.08 | 1.00 | 0.78 | 0.77 | 0.82 | 0.88 | 0.85 | 0.87 | 0.83 | 0.83 | 0.80 | 0.76 | 0.74 | 0.72 | -27.6% | -14.9% | -1.8% |
| | CO2 emission intensity index (post-adjustment) | | 1.08 | 1.00 | 0.73 | 0.71 | 0.79 | 0.80 | 0.85 | 0.87 | 0.83 | 0.83 | 0.79 | 0.76 | 0.74 | 0.73 | -27.3% | -14.6% | -1.5% |
| | Energy consumption | | 76 | 113 | 108 | 109 | 109 | 112 | 117 | 114 | 114 | 117 | 116 | 112 | 111 | 108 | -4.4% | -7.0% | -2.7% |
| | Energy consumption intensity index | Base year: FY2005 | 1.06 | 1.00 | 0.86 | 0.85 | 0.81 | 0.82 | 0.79 | 0.82 | 0.80 | 0.81 | 0.80 | 0.79 | 0.79 | 0.78 | -21.8% | -1.0% | -0.7% |
| | Production activity index | | 0.63 | 1.00 | 1.11 | 1.13 | 1.18 | 1.20 | 1.30 | 1.22 | 1.25 | 1.27 | 1.28 | 1.25 | 1.25 | 1.22 | 22.2% | -6.0% | -2.0% |
| Japan Aluminum Association | CO2 emissions (actual emissions) | | 156 | 168 | 133 | 138 | 145 | 148 | 146 | 149 | 145 | 145 | 142 | 134 | 127 | 117 | -30.3% | -19.8% | -7.6% |
| | CO2 emissions (post-adjustment) | | 156 | 168 | 124 | 129 | 140 | 136 | 146 | 149 | 144 | 145 | 142 | 135 | 127 | 118 | -30.0% | -19.5% | -7.4% |
| | CO2 emission intensity index (actual emissions) | | 1.04 | 1.00 | 0.92 | 0.88 | 0.98 | 1.05 | 1.05 | 0.99 | 0.97 | 0.97 | 0.96 | 0.97 | 0.97 | 0.96 | -4.0% | -8.3% | -1.0% |
| | CO2 emission intensity index (post-adjustment) | | 1.04 | 1.00 | 0.86 | 0.82 | 0.95 | 0.96 | 1.05 | 0.99 | 0.96 | 0.97 | 0.96 | 0.97 | 0.97 | 0.96 | -3.7% | -8.0% | -0.8% |
| | Energy consumption | | 77 | 81 | 69 | 73 | 69 | 67 | 66 | 69 | 68 | 69 | 69 | 68 | 65 | 61 | -24.6% | -8.2% | -6.8% |
| | Energy consumption intensity index ☆ | | 1.07 | 1.00 | 1.00 | 0.96 | 0.97 | 0.99 | 0.99 | 0.94 | 0.94 | 0.97 | 0.97 | 1.02 | 1.04 | 1.04 | 3.9% | 4.9% | -0.1% |
| | Production activity index | | 0.89 | 1.00 | 0.86 | 0.94 | 0.88 | 0.84 | 0.83 | 0.90 | 0.89 | 0.89 | 0.88 | 0.82 | 0.78 | 0.73 | -27.4% | -12.5% | -6.7% |
| Japan Federation of Printing Industries | CO2 emissions (actual emissions) ☆ | | | 138 | 128 | 129 | 143 | 151 | 144 | 138 | 137 | 133 | 120 | 110 | 101 | 94 | -31.6% | -34.8% | -6.8% |
| | CO2 emissions (post-adjustment) | | | 138 | 116 | 117 | 136 | 134 | 144 | 138 | 136 | 132 | 120 | 110 | 101 | 95 | -31.3% | -34.5% | -6.5% |
| | Energy consumption | | | 74 | 72 | 72 | 70 | 68 | 64 | 63 | 64 | 63 | 59 | 56 | 53 | 50 | -32.4% | -21.7% | -5.7% |
| Flat Glass Manufacturers Association of Japan | CO2 emissions (actual emissions) ☆ | | 181 | 134 | 110 | 115 | 117 | 113 | 117 | 110 | 106 | 106 | 109 | 110 | 111 | 94 | -30.0% | -19.7% | -15.6% |
| | CO2 emissions (post-adjustment) | | 181 | 134 | 107 | 113 | 115 | 109 | 117 | 110 | 106 | 106 | 109 | 110 | 111 | 94 | -29.9% | -19.6% | -15.5% |
| | CO2 emission intensity index (actual emissions) | Base year: FY2005 | 0.97 | 1.00 | 1.12 | 1.01 | 1.07 | 0.97 | 0.91 | 0.91 | 0.85 | 0.87 | 0.87 | 0.85 | 0.90 | 1.01 | 0.6% | 10.6% | 12.4% |
| | CO2 emission intensity index (post-adjustment) | | 0.97 | 1.00 | 1.09 | 0.98 | 1.05 | 0.94 | 0.91 | 0.91 | 0.85 | 0.87 | 0.87 | 0.85 | 0.90 | 1.01 | 0.7% | 10.7% | 12.5% |
| | Energy consumption | | 73 | 52 | 44 | 46 | 45 | 43 | 44 | 42 | 42 | 42 | 44 | 45 | 45 | 37 | -28.8% | -15.6% | -16.6% |
| | Energy consumption intensity index | Base year: FY2005 | 1.00 | 1.00 | 1.15 | 1.04 | 1.06 | 0.95 | 0.88 | 0.89 | 0.85 | 0.89 | 0.89 | 0.89 | 0.92 | 1.02 | 2.3% | 16.2% | 11.1% |
| | Production activity index | | 1.38 | 1.00 | 0.73 | 0.85 | 0.82 | 0.87 | 0.96 | 0.90 | 0.93 | 0.90 | 0.94 | 0.96 | 0.93 | 0.70 | -30.4% | -27.4% | -24.9% |
| Japan Soft Drink Association | CO2 emissions (actual emissions) | | 47 | 103 | 103 | 104 | 110 | 117 | 122 | 116 | 115 | 114 | 111 | 118 | 116 | 105 | 2.3% | -14.1% | -9.6% |
| | CO2 emissions (post-adjustment) | | 47 | 103 | 99 | 99 | 107 | 110 | 122 | 116 | 115 | 114 | 111 | 118 | 116 | 105 | 2.6% | -13.8% | -9.4% |
| | CO2 emission intensity index (actual emissions) ☆ | Base year: FY1990 | 1.00 | 1.13 | 1.04 | 0.98 | 1.00 | 1.04 | 0.99 | 0.95 | 0.91 | 0.88 | 0.83 | 0.85 | 0.79 | 0.79 | -30.3% | -20.5% | -0.2% |
| | CO2 emission intensity index (post-adjustment) | | 1.00 | 1.13 | 0.99 | 0.93 | 0.97 | 0.97 | 0.99 | 0.95 | 0.91 | 0.88 | 0.83 | 0.85 | 0.79 | 0.79 | -30.1% | -20.2% | 0.1% |
| | Energy consumption | | 21 | 48 | 53 | 54 | 53 | 54 | 57 | 54 | 55 | 55 | 55 | 60 | 60 | 55 | 13.8% | -2.9% | -8.6% |
| | Energy consumption intensity index | Base year: FY1990 | 1.00 | 1.20 | 1.19 | 1.13 | 1.08 | 1.08 | 1.03 | 1.00 | 0.98 | 0.96 | 0.92 | 0.97 | 0.92 | 0.93 | -22.5% | -10.1% | 1.0% |
| | Production activity index | | 1.00 | 1.92 | 2.11 | 2.25 | 2.34 | 2.39 | 2.60 | 2.59 | 2.69 | 2.75 | 2.83 | 2.93 | 3.11 | 2.81 | 46.8% | 8.1% | -9.5% |
| Japan Dairy Industry Association | CO2 emissions (actual emissions) | | 86 | 112 | 110 | 110 | 114 | 121 | 120 | 116 | 116 | 112 | 104 | 98 | 96 | 94 | -16.3% | -21.5% | -2.0% |
| | CO2 emissions (post-adjustment) | | 86 | 112 | 105 | 104 | 112 | 113 | 120 | 115 | 116 | 112 | 104 | 98 | 96 | 94 | -16.0% | -21.3% | -1.8% |
| | CO2 emission intensity index (actual emissions) | Base year: FY2013 | 0.84 | 1.06 | | | | | 1.00 | 0.97 | 0.90 | 0.87 | 0.81 | 0.77 | 0.76 | 0.76 | -27.9% | -23.5% | 0.3% |
| | CO2 emission intensity index (post-adjustment) | | 0.84 | 1.06 | | | | | 1.00 | 0.97 | 0.90 | 0.87 | 0.81 | 0.78 | 0.76 | 0.77 | -27.7% | -23.3% | 0.5% |
| | Energy consumption | | 41 | 51 | 54 | 54 | 52 | 53 | 52 | 51 | 53 | 52 | 49 | 48 | 48 | 47 | 7.8% | -8.9% | -0.8% |
| | Energy consumption intensity index ☆ | Base year: FY2013 | 0.92 | 1.12 | | | | | 1.00 | 0.99 | 0.94 | 0.92 | 0.88 | 0.87 | 0.87 | 0.89 | -20.6% | -11.3% | 1.5% |
| | Production activity index | | 0.85 | 0.88 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.07 | 1.07 | 1.07 | 1.05 | 1.05 | 1.03 | 16.1% | 2.6% | -2.3% |
| The Japanese Electric Wire & Cable Makers' Association | CO2 emissions (actual emissions) | | 109 | 91 | 78 | 82 | 94 | 99 | 96 | 92 | 88 | 86 | 83 | 78 | 72 | 65 | -28.5% | -32.0% | -8.7% |
| | CO2 emissions (post-adjustment) | | 109 | 91 | 69 | 72 | 89 | 86 | 96 | 91 | 88 | 85 | 82 | 79 | 72 | 66 | -28.1% | -31.6% | -8.4% |
| (metal (copper/aluminnum) cable) | CO2 emission intensity index (actual emissions) | | 0.94 | 1.00 | 1.03 | 1.08 | 1.21 | 1.28 | 1.22 | 1.15 | 1.14 | 1.14 | 1.07 | 0.97 | 0.88 | 0.92 | -8.1% | -24.6% | 4.1% |
| (metal (copper/aluminnum) cable) | CO2 emission intensity index (post-adjustment) | Base year: FY2005 | 0.94 | 1.00 | 0.91 | 0.95 | 1.14 | 1.12 | 1.22 | 1.15 | 1.14 | 1.13 | 1.07 | 0.97 | 0.88 | 0.92 | -7.6% | -24.2% | 4.5% |
| (optical fiber cable) | CO2 emission intensity index (actual emissions) | | 3.76 | 1.00 | 0.84 | 0.90 | 0.99 | 0.98 | 1.04 | 0.92 | 0.83 | 0.79 | 0.73 | 0.75 | 0.82 | 0.72 | -28.3% | -31.0% | -12.9% |
| (optical fiber cable) | CO2 emission intensity index (post-adjustment) | | 3.76 | 1.00 | 0.73 | 0.78 | 0.93 | 0.84 | 1.04 | 0.91 | 0.83 | 0.78 | 0.73 | 0.75 | 0.82 | 0.72 | -27.8% | -30.6% | -12.5% |
| | Energy consumption ☆ | | 64 | 50 | 45 | 47 | 45 | 43 | 42 | 41 | 40 | 40 | 40 | 40 | 38 | 35 | -29.7% | -15.2% | -7.3% |
| (metal (copper/aluminnum) cable) | Energy consumption intensity index | | 1.00 | 1.00 | 1.07 | 1.12 | 1.06 | 1.03 | 0.97 | 0.93 | 0.95 | 0.97 | 0.95 | 0.91 | 0.86 | 0.91 | -9.4% | -6.3% | 5.7% |
| (optical fiber cable) | Energy consumption intensity index | Base year: FY2005 | 4.20 | 1.00 | 0.85 | 0.91 | 0.83 | 0.75 | 0.78 | 0.71 | 0.66 | 0.65 | 0.63 | 0.68 | 0.78 | 0.69 | -31.2% | -12.1% | -11.6% |
| (metal (copper/aluminnum) cable) | Production activity index | | 1.37 | 1.00 | 0.78 | 0.78 | 0.79 | 0.78 | 0.81 | 0.82 | 0.79 | 0.77 | 0.78 | 0.81 | 0.82 | 0.71 | -28.7% | -11.5% | -13.1% |
| (optical fiber cable) | Production activity index | | 0.07 | 1.00 | 1.64 | 1.53 | 1.74 | 1.89 | 1.66 | 1.71 | 1.92 | 1.98 | 2.05 | 2.05 | 1.64 | 1.80 | 79.8% | 8.6% | 9.8% |
| The Japan Bearing Industrial Association | CO2 emissions (actual emissions) | | | 73 | 58 | 70 | 83 | 83 | 85 | 84 | 79 | 78 | 79 | 74 | 68 | 59 | -19.3% | -30.3% | -12.7% |
| | CO2 emissions (post-adjustment) | | | 73 | 51 | 62 | 78 | 73 | 85 | 84 | 79 | 78 | 78 | 74 | 68 | 59 | -18.9% | -29.9% | -12.3% |
| | CO2 emission intensity index (actual emissions) | | | 0.98 | 0.97 | 0.90 | 1.04 | 1.14 | 1.14 | 1.05 | 1.04 | 1.02 | 0.93 | 0.87 | 0.87 | 0.88 | -11.1% | -23.0% | 0.3% |
| | CO2 emission intensity index (post-adjustment) | Base year: FY1997 | | 0.98 | 0.86 | 0.79 | 0.98 | 1.00 | 1.14 | 1.05 | 1.04 | 1.02 | 0.93 | 0.87 | 0.87 | 0.88 | -10.6% | -22.6% | 0.7% |
| | CO2 emission intensity index (fixity coefficient) ☆ | | | 0.88 | 0.87 | 0.80 | 0.79 | 0.79 | 0.79 | 0.75 | 0.76 | 0.77 | 0.72 | 0.71 | 0.74 | 0.75 | -14.1% | -5.0% | 1.6% |
| | Energy consumption | | | 40 | 33 | 40 | 40 | 37 | 37 | 37 | 36 | 37 | 38 | 38 | 36 | 32 | -20.7% | -14.1% | -11.5% |
| | Energy consumption intensity index | Base year: FY1997 | | 0.86 | 0.88 | 0.81 | 0.80 | 0.80 | 0.79 | 0.75 | 0.76 | 0.76 | 0.72 | 0.71 | 0.74 | 0.73 | -15.0% | -7.8% | -1.2% |
| | Production activity index | | | 1.32 | 1.06 | 1.39 | 1.42 | 1.29 | 1.32 | 1.41 | 1.35 | 1.37 | 1.50 | 1.51 | 1.37 | 1.29 | -2.3% | -2.4% | -6.2% |

| Industry | (*2) (☆:target adopted by the industry) | Notes | 1990 | 2005 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Relative to FY2005 | Relative to FY2013 | Relative to previous FY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| The Japan Society of Industrial Machinery Manufacturers | CO2 emissions (actual emissions) | | | 60 | 47 | 51 | 61 | 61 | 61 | 61 | 58 | 57 | 55 | 51 | 50 | 48 | -21.1% | -21.9% | -4.3% |
| | CO2 emissions (post-adjustment) | | | 60 | 42 | 46 | 58 | 54 | 61 | 61 | 58 | 57 | 55 | 51 | 50 | 48 | -20.7% | -21.4% | -3.9% |
| | Energy consumption | | | 32 | 26 | 29 | 29 | 27 | 27 | 27 | 27 | 27 | 27 | 26 | 26 | 25 | -20.9% | -4.2% | -2.8% |
| | Production activity index | Base year: FY2013 | | 0.99 | 1.01 | 1.00 | 1.05 | 1.02 | 1.00 | 1.06 | 1.14 | 1.06 | 1.09 | 1.16 | 1.13 | 1.10 | 10.9% | 10.2% | -2.0% |
| Japan Petroleum Development Association *5 | CO2 emissions (actual emissions) | ☆ | 13 | 17 | 21 | 19 | 20 | 22 | 23 | 19 | 19 | 20 | 19 | 18 | 17 | 16 | -5.9% | -28.8% | -5.9% |
| | CO2 emissions (post-adjustment) | | 13 | 17 | 20 | 18 | 20 | 21 | 23 | 19 | 19 | 19 | 19 | 18 | 17 | 18 | 3.1% | -21.9% | 3.1% |
| | CO2 emission intensity index (actual emissions) | Base year: FY2005 | 1.30 | 1.00 | 1.06 | 1.04 | 1.14 | 1.30 | 1.46 | 1.33 | 1.37 | 1.36 | 1.28 | 1.34 | 1.37 | 1.43 | 42.9% | -1.9% | 3.9% |
| | CO2 emission intensity index (post-adjustment) | ☆ | 1.30 | 1.00 | 1.03 | 1.01 | 1.12 | 1.24 | 1.46 | 1.33 | 1.37 | 1.36 | 1.28 | 1.34 | 1.38 | 1.57 | 56.6% | 7.5% | 13.8% |
| | Energy consumption | | 6 | 9 | 10 | 10 | 10 | 10 | 11 | 9 | 9 | 10 | 10 | 9 | 9 | 9 | 7.6% | -13.7% | 3.8% |
| | Energy consumption intensity index | Base year: FY2005 | 1.26 | 1.00 | 1.07 | 1.07 | 1.12 | 1.23 | 1.37 | 1.28 | 1.33 | 1.34 | 1.27 | 1.37 | 1.42 | 1.63 | 63.3% | 18.9% | 14.7% |
| | Production activity index | | 0.57 | 1.00 | 1.14 | 1.06 | 1.05 | 0.99 | 0.91 | 0.84 | 0.82 | 0.84 | 0.87 | 0.77 | 0.73 | 0.66 | -34.1% | -27.4% | -9.5% |
| Japan Copper and Brass Association | CO2 emissions (actual emissions) | | | 43 | 39 | 41 | 44 | 47 | 48 | 46 | 42 | 45 | 40 | 38 | 35 | 33 | -22.7% | -31.0% | -6.5% |
| | CO2 emissions (post-adjustment) | | | 43 | 35 | 37 | 42 | 42 | 48 | 46 | 42 | 45 | 40 | 38 | 35 | 33 | -22.4% | -30.6% | -6.2% |
| | CO2 emission intensity index (actual emissions) | Base year: FY2005 | | 1.00 | 1.10 | 1.05 | 1.20 | 1.34 | 1.28 | 1.21 | 1.24 | 1.21 | 1.22 | 1.12 | 1.17 | 1.21 | 20.9% | -5.7% | 3.4% |
| | CO2 emission intensity index (post-adjustment) | | | 1.00 | 0.99 | 0.95 | 1.15 | 1.19 | 1.28 | 1.21 | 1.23 | 1.21 | 1.22 | 1.12 | 1.17 | 1.21 | 21.4% | -5.3% | 3.7% |
| | Energy consumption | | | 23 | 22 | 23 | 22 | 21 | 21 | 21 | 20 | 21 | 20 | 19 | 18 | 17 | -24.3% | -17.9% | -5.4% |
| | Energy consumption intensity index | ☆ Base year: FY2005 | | 1.00 | 1.13 | 1.09 | 1.08 | 1.11 | 1.06 | 1.01 | 1.06 | 1.06 | 1.10 | 1.05 | 1.13 | 1.18 | 18.4% | 12.2% | 4.6% |
| | Production activity index | | | 1.00 | 0.83 | 0.93 | 0.87 | 0.82 | 0.87 | 0.89 | 0.81 | 0.88 | 0.77 | 0.79 | 0.71 | 0.64 | -36.1% | -26.8% | -9.6% |
| Brewers Association of Japan | CO2 emissions (actual emissions) | | 117 | 90 | 60 | 57 | 53 | 52 | 49 | 48 | 47 | 47 | 46 | 45 | 44 | 39 | -56.2% | -19.7% | -10.3% |
| | CO2 emissions (post-adjustment) | ☆ | 117 | 90 | 60 | 57 | 53 | 52 | 49 | 48 | 47 | 47 | 46 | 45 | 44 | 39 | -56.2% | -19.7% | -10.3% |
| | CO2 emission intensity index (actual emissions) | | 1.00 | 0.79 | 0.56 | 0.54 | 0.51 | 0.50 | 0.49 | 0.48 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 | -41.1% | -3.8% | -0.8% |
| | CO2 emission intensity index (post-adjustment) | | 1.00 | 0.79 | 0.56 | 0.54 | 0.51 | 0.50 | 0.49 | 0.48 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 | -41.1% | -3.8% | -0.8% |
| | Energy consumption | | 56 | | | 32 | 29 | 28 | 27 | 26 | 26 | 25 | 25 | 24 | 24 | 21 | | -22.7% | -11.1% |
| | Energy consumption intensity index | | 1.00 | | | 0.63 | 0.60 | 0.57 | 0.56 | 0.54 | 0.53 | 0.53 | 0.53 | 0.52 | 0.53 | 0.52 | | -7.3% | -1.6% |
| | Production activity index | | 1.00 | 0.98 | 0.92 | 0.90 | 0.88 | 0.88 | 0.87 | 0.86 | 0.86 | 0.85 | 0.83 | 0.82 | 0.80 | 0.72 | -25.7% | -16.6% | -9.6% |
| The Shipbuilders' Association of Japan and the Cooperative Association of Japan Shipbuilders (hours) | CO2 emissions (actual emissions) | | | | | | | 68 | 65 | 69 | 69 | 71 | 65 | 59 | 53 | 53 | | -18.4% | -0.8% |
| | CO2 emissions (post-adjustment) | | | | | | | 59 | 65 | 69 | 69 | 70 | 65 | 60 | 54 | 53 | | -18.0% | -0.4% |
| | CO2 emission intensity index (actual emissions) | ☆ (hours) | | | | | | 1.00 | 1.06 | 1.12 | 1.00 | 1.01 | 0.99 | 0.91 | 0.81 | 0.88 | | -16.4% | 9.5% |
| | CO2 emission intensity index (post-adjustment) | (hours) | | | | | | 1.00 | 1.21 | 1.28 | 1.15 | 1.15 | 1.13 | 1.04 | 0.93 | 1.02 | | -15.9% | 10.0% |
| | CO2 emission intensity index (actual emissions) | (quantity at completion) | | | | | | 1.00 | 1.17 | 1.27 | 1.26 | 1.38 | 1.28 | 1.02 | 0.84 | 1.05 | | -10.1% | 24.4% |
| | CO2 emission intensity index (post-adjustment) | ☆ (quantity at completion) | | | | | | 1.00 | 1.34 | 1.46 | 1.44 | 1.58 | 1.47 | 1.17 | 0.97 | 1.21 | | -9.6% | 24.9% |
| | Energy consumption | | | | | | | 29 | 28 | 30 | 31 | 32 | 31 | 30 | 28 | 28 | | 1.7% | 0.5% |
| | Energy consumption intensity index | (hours) | | | | | | 1.00 | 1.04 | 1.13 | 1.04 | 1.08 | 1.10 | 1.06 | 0.98 | 1.09 | | 4.3% | 11.0% |
| | Energy consumption intensity index | (quantity at completion) | | | | | | 1.00 | 1.15 | 1.28 | 1.31 | 1.48 | 1.43 | 1.19 | 1.02 | 1.29 | | 12.2% | 26.1% |
| | Production activity index | (hours) | | | | | | 1.00 | 0.91 | 0.92 | 1.02 | 1.03 | 0.97 | 0.97 | 0.98 | 0.89 | | -2.5% | -9.4% |
| | Production activity index | (quantity at completion) | | | | | | 1.00 | 0.83 | 0.81 | 0.81 | 0.75 | 0.75 | 0.86 | 0.94 | 0.75 | | -9.3% | -20.3% |
| Limestone Association of Japan | CO2 emissions (actual emissions) | ☆ | | 25 | 20 | 21 | 24 | 27 | 28 | 28 | 27 | 27 | 26 | 26 | 26 | 24 | -3.0% | -14.4% | -5.0% |
| | CO2 emissions (post-adjustment) | | | 25 | 19 | 20 | 23 | 25 | 28 | 28 | 27 | 27 | 26 | 26 | 26 | 24 | -2.6% | -14.1% | -4.8% |
| | CO2 emission intensity index (actual emissions) | Base year: FY2010 | | 0.98 | 0.99 | 1.00 | 1.12 | 1.19 | 1.19 | 1.19 | 1.19 | 1.19 | 1.15 | 1.11 | 1.13 | 1.14 | 16.8% | -4.6% | 0.9% |
| | CO2 emission intensity index (post-adjustment) | | | 1.06 | 0.99 | 1.00 | 1.17 | 1.17 | 1.30 | 1.30 | 1.30 | 1.29 | 1.25 | 1.21 | 1.23 | 1.24 | 17.2% | -4.3% | 1.2% |
| | Energy consumption | | | 12 | 10 | 11 | 11 | 11 | 12 | 12 | 12 | 11 | 12 | 12 | 12 | 11 | -7.0% | -2.4% | -4.9% |
| | Energy consumption intensity index | Base year: FY2010 | | 0.95 | 0.99 | 1.00 | 0.99 | 0.99 | 0.98 | 0.99 | 1.01 | 1.03 | 1.02 | 1.02 | 1.05 | 1.07 | 12.0% | 8.7% | 1.1% |
| | Production activity index | | | 1.20 | 0.97 | 1.00 | 1.01 | 1.06 | 1.11 | 1.10 | 1.07 | 1.05 | 1.07 | 1.09 | 1.06 | 1.00 | -16.9% | -10.3% | -5.9% |
| Japan Machine Tool Builders' Association | CO2 emissions (actual emissions) | | 25 | 27 | 20 | 26 | 32 | 35 | 36 | 37 | 36 | 33 | 34 | 33 | 29 | 25 | -6.3% | -30.1% | -13.4% |
| | CO2 emissions (post-adjustment) | | 25 | 27 | 17 | 23 | 30 | 31 | 36 | 37 | 35 | 33 | 34 | 33 | 29 | 26 | -5.7% | -29.7% | -13.1% |
| | CO2 emission intensity index (actual emissions) | | 1.00 | 0.84 | 1.41 | 1.09 | 1.15 | 1.23 | 1.31 | 1.13 | 1.04 | 1.06 | 0.93 | 0.80 | 0.86 | 1.03 | 22.8% | -21.7% | 19.3% |
| | CO2 emission intensity index (post-adjustment) | | 1.00 | 0.84 | 1.24 | 0.96 | 1.08 | 1.07 | 1.31 | 1.13 | 1.04 | 1.05 | 0.93 | 0.81 | 0.86 | 1.04 | 23.6% | -21.2% | 19.8% |
| | Energy consumption | | 15 | 15 | 11 | 15 | 15 | 15 | 15 | 16 | 16 | 15 | 16 | 17 | 15 | 14 | -7.2% | -11.9% | -11.7% |
| | Energy consumption intensity index | ☆ | 1.00 | 0.78 | 1.36 | 1.05 | 0.94 | 0.91 | 0.96 | 0.85 | 0.81 | 0.84 | 0.77 | 0.70 | 0.78 | 0.95 | 21.7% | -1.3% | 21.7% |
| | Production activity index | | 1.00 | 1.29 | 0.56 | 0.95 | 1.10 | 1.14 | 1.10 | 1.31 | 1.36 | 1.26 | 1.44 | 1.62 | 1.36 | 0.98 | -23.7% | -10.7% | -27.5% |
| Japan Sanitary Equipment Industry Association | CO2 emissions (actual emissions) | | | 50 | 36 | 26 | 24 | 28 | 26 | 26 | 23 | 20 | 20 | 20 | 20 | 20 | 18 | -50.3% | -29.4% | -8.0% |
| | CO2 emissions (post-adjustment) | ☆ | | 50 | 36 | 25 | 22 | 27 | 24 | 26 | 23 | 20 | 20 | 20 | 20 | 20 | 18 | -50.1% | -29.2% | -7.8% |
| | CO2 emission intensity index (actual emissions) | Base year: FY1990 | 1.00 | 0.69 | 0.57 | 0.45 | 0.52 | 0.48 | 0.43 | 0.39 | 0.34 | 0.32 | 0.33 | 0.33 | 0.31 | 0.30 | -56.0% | -28.7% | -3.2% |
| | CO2 emission intensity index (post-adjustment) | | 1.00 | 0.69 | 0.54 | 0.42 | 0.50 | 0.44 | 0.43 | 0.39 | 0.34 | 0.32 | 0.33 | 0.33 | 0.31 | 0.30 | -55.8% | -28.5% | -3.0% |
| | Energy consumption | | 23 | 17 | 13 | 12 | 13 | 12 | 12 | 11 | 9 | 9 | 10 | 10 | 10 | 10 | -44.6% | -18.0% | -7.2% |
| | Energy consumption intensity index | Base year: FY1990 | 1.00 | 0.69 | 0.62 | 0.50 | 0.52 | 0.46 | 0.41 | 0.38 | 0.34 | 0.33 | 0.35 | 0.35 | 0.35 | 0.34 | -50.9% | -17.1% | -2.3% |
| | Production activity index | | 1.00 | 1.07 | 0.92 | 1.07 | 1.08 | 1.10 | 1.22 | 1.20 | 1.18 | 1.22 | 1.19 | 1.26 | 1.27 | 1.21 | 12.9% | -1.0% | -5.0% |
| Flour Millers Association | CO2 emissions (actual emissions) | | 19 | 23 | 22 | 23 | 28 | 31 | 30 | 30 | 29 | 28 | 27 | 24 | 23 | 22 | -4.3% | -26.5% | -3.3% |
| | CO2 emissions (post-adjustment) | | 19 | 23 | 19 | 20 | 26 | 26 | 30 | 30 | 29 | 28 | 27 | 24 | 23 | 23 | -3.7% | -26.0% | -2.9% |
| | CO2 emission intensity index (actual emissions) | ☆ Base year: FY2013 | 0.72 | 0.77 | 0.74 | 0.74 | 0.92 | 1.01 | 1.00 | 0.99 | 0.93 | 0.90 | 0.87 | 0.79 | 0.76 | 0.75 | -2.0% | -24.7% | -1.0% |
| | CO2 emission intensity index (post-adjustment) | | 0.72 | 0.77 | 0.64 | 0.64 | 0.86 | 0.86 | 1.00 | 0.99 | 0.93 | 0.89 | 0.86 | 0.79 | 0.76 | 0.76 | -1.4% | -24.2% | -0.5% |
| | Energy consumption | | 12 | 13 | 13 | 14 | 14 | 13 | 13 | 13 | 13 | 13 | 13 | 12 | 12 | 12 | -8.8% | -6.9% | -1.9% |
| | Energy consumption intensity index | Base year: FY2013 | 1.05 | 1.02 | 1.02 | 1.02 | 1.03 | 1.02 | 1.00 | 1.01 | 0.98 | 0.97 | 0.97 | 0.95 | 0.95 | 0.95 | -6.6% | -4.7% | 0.5% |
| | Production activity index | | 0.86 | 1.00 | 0.98 | 1.01 | 1.01 | 1.00 | 1.00 | 1.00 | 1.01 | 1.01 | 1.01 | 1.00 | 1.00 | 0.98 | -2.4% | -2.3% | -2.4% |
| Japan Industrial Vehicles Association | CO2 emissions (actual emissions) | ☆ | 7 | 7 | 4 | 5 | 6 | 6 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | -48.2% | -24.5% | -1.8% |
| | CO2 emissions (post-adjustment) | | 7 | 7 | 4 | 4 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | -48.0% | -24.1% | -1.5% |
| | CO2 emission intensity index (actual emissions) | Base year: FY2005 | 0.85 | 1.00 | 1.18 | 0.96 | 1.03 | 1.12 | 0.90 | 0.85 | 0.80 | 0.81 | 0.76 | 0.67 | 0.69 | 0.71 | -28.5% | -21.0% | 4.3% |
| | CO2 emission intensity index (post-adjustment) | | 0.85 | 1.00 | 1.09 | 0.88 | 0.99 | 1.00 | 0.90 | 0.85 | 0.80 | 0.81 | 0.76 | 0.67 | 0.69 | 0.72 | -28.2% | -20.6% | 4.7% |
| | Energy consumption | | 3 | 4 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | -46.9% | -9.3% | -0.5% |
| | Energy consumption intensity index | Base year: FY2005 | 0.86 | 1.00 | 1.22 | 1.01 | 0.95 | 0.96 | 0.77 | 0.74 | 0.71 | 0.74 | 0.71 | 0.66 | 0.69 | 0.73 | -26.7% | -5.1% | 5.7% |
| | Production activity index | | 1.11 | 1.00 | 0.54 | 0.73 | 0.81 | 0.77 | 0.76 | 0.79 | 0.79 | 0.76 | 0.80 | 0.84 | 0.77 | 0.72 | -27.6% | -4.5% | -5.9% |

| Industry | (*2) （☆：target adopted by the industry） | Notes | 1990 | 2005 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Relative to FY2005 | Relative to FY2013 | Relative to previous FY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Japan Association of Rolling Stock Industries | CO2 emissions (actual emissions) | ☆ | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 3 | 3 | 3 | -21.4% | -20.3% | -5.0% |
| | CO2 emissions (post-adjustment) | | 5 | 4 | 3 | 3 | 3 | 3 | 4 | 4 | 3 | 3 | 4 | 3 | 3 | 3 | -21.0% | -19.8% | -4.7% |
| | CO2 emission intensity index (actual emissions) | Base year: FY1990 | 1.00 | 0.56 | 0.43 | 0.48 | 0.55 | 0.61 | 0.50 | 0.51 | 0.44 | 0.49 | 0.45 | 0.33 | 0.33 | 0.32 | -43.3% | -37.4% | -5.4% |
| | CO2 emission intensity index (post-adjustment) | | 1.00 | 0.56 | 0.38 | 0.42 | 0.52 | 0.54 | 0.50 | 0.51 | 0.44 | 0.49 | 0.45 | 0.33 | 0.33 | 0.32 | -43.0% | -37.1% | -5.1% |
| | Energy consumption | | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | -23.2% | -2.8% | -3.7% |
| | Energy consumption intensity index | Base year: FY1990 | 1.00 | 0.55 | 0.43 | 0.49 | 0.47 | 0.49 | 0.40 | 0.41 | 0.36 | 0.41 | 0.40 | 0.31 | 0.32 | 0.30 | -44.6% | -23.7% | -4.1% |
| | Production activity index | | 1.00 | 1.43 | 1.80 | 1.59 | 1.44 | 1.27 | 1.56 | 1.53 | 1.69 | 1.50 | 1.68 | 2.04 | 1.98 | 1.99 | 38.5% | 27.4% | 0.4% |
| Emissions from industrial | CO2 emissions | | 6,052 | 5,113 | 4,172 | 4,272 | 4,238 | 4,267 | 4,467 | 4,432 | 4,242 | 4,237 | 4,273 | 4,262 | 4,115 | 3,764 | -26.4% | -15.7% | -8.5% |
| Revisions *4 | CO2 emissions (actual emissions) | | | 23 | 24 | 25 | 43 | 53 | 52 | 48 | 43 | 39 | 35 | 30 | 27 | 23 | | | |
| | CO2 emissions (post-adjustment) | | | | | | | | | | | | | | | | | | |
| Total *7 | CO2 emissions (actual emissions) | | 40,414 | 41,761 | 36,463 | 38,707 | 38,828 | 39,044 | 39,876 | 39,309 | 37,941 | 37,622 | 37,516 | 36,546 | 35,519 | 31,592 | -25.0% | -20.8% | -11.1% |
| | CO2 emissions (post-adjustment) | | 40,414 | 41,737 | 35,643 | 37,812 | 38,316 | 37,866 | 39,821 | 39,239 | 37,851 | 37,549 | 37,464 | 36,534 | 35,494 | 31,596 | -24.9% | -20.7% | -11.0% |
| | Energy consumption | | 12,120 | 13,402 | 11,969 | 12,743 | 12,321 | 12,007 | 12,166 | 12,042 | 11,744 | 11,732 | 11,788 | 11,620 | 11,377 | 10,224 | -24.7% | -16.0% | -10.1% |

*1 Due to the rounding off, totals may differ from the sum of individual items.
*2 Intensity indices have been calculated by having each industry set a base year, the figure for which is used as 1. Unless otherwise specified in remarks (BAU baseline etc.), the base year is fiscal 1990.
*3 The Liaison Group of Japanese Electrical and Electronics Industries for Global Warming Prevention has implemented the Commitment to Low Carbon Society as a new scheme independent of the conventional Voluntary Action Plan on the Environment. Therefore, data for participating industries under Keidanren's commitment to a Low Carbon Society are available for only the years following the base year (fiscal 2012). The figures provided for fiscal 1990-2011 have been derived from the Voluntary Action Plan on the Environment as reference.
*4 Figures for the Japan Rubber Manufacturers Association have been caclulated using the coefficient for thermal power generation and a fixity coefficent for fiscal 2005 (base year) has been used to calculate actual emissions. The difference between a simple suminclding relevant industries and the total is provided as "Revisions".
*5 $CO_2$ emissions of the Japan Petroleum Development Association included dissipated gas from mining facilities.
*6 Emissions from industrial processes refer to $CO_2$ emissions from manufacturing processes that are not energy-oriented.
*7 The rate of change from fiscal 2005 to fiscal 2020 is calculated except for industries with no data for fiscal 2005.

Calculation method
Period covered: April 1, 2020 – March 31, 2021
Scope of calculation: Participating industries under the Keidanren Commitment to a Low Carbon Society and Commitment to a Low Carbon Society (62 industries)
$CO_2$ emissions: Σ〔(annual consumption of fuel oil, gas, heat) × energy-specific calorific coefficient [*1] × energy-specific carbon emission coefficient [*1] × $CO_2$ conversion factor [*2]〕+(annual electric power consumption within industry-specific boundaries ) × $CO_2$conversion factor [3]
*1 Source: Agency for Natural Resources and Energy “General Energy Statistics” However, the standard state of gases was redefined in “General Energy Statistics fiscal 2013 preliminary figures” (published on November 14, 2014); and therefore, the old calorific figures are used for natural gas and city gas, in order to maintain the continuity of the data and scheme. For some fuels, industries use coefficients calculated using their own data.
*2 Source: National Institute for Environmental Studies, Japan, “Japan’s greenhouse gas emission report.” For some fuels, industries use coefficients calculated using their own data.
*3 Source: Electric Power Council for a Low Carbon Society.

The $CO_2$ emission factor for electric power use (emission coefficient for electricity) used to calculate total $CO_2$ emissions in fiscal 2020 is a preliminary value . (*)
Basic emission coefficient (emission coefficient for actual emissions): 4.36 t-$CO_2$/10,000kWh; post-adjustment emission coefficient: 4.39 t-$CO_2$/10,000kWh

2. Energy Conversion Sector

10,000t-$CO_2$: 10,000kl crude oil equivalent; fiscal year

| Industry | (*1) （☆:target adopted by the industry) | Notes | 2001 | 2002 | 2003 | 2004 | 2005 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Relative to FY2005 | Relative to FY2013 | Relative to previous FY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| The Electric Power Council for a Low Carbon Society *2 | CO2 emissions (actual emissions) | | 31,000 | 34,000 | 36,100 | 36,200 | 37,300 | 36,100 | 38,200 | 44,600 | 49,400 | 49,400 | 47,000 | 44,400 | 43,200 | 41,100 | 37,000 | 34,400 | 32,800 | -12.1% | -33.6% | -4.7% |
| | CO2 emissions (post-adjustment) | | 31,000 | 34,000 | 36,100 | 36,200 | 37,300 | 30,800 | 32,500 | 41,600 | 41,700 | 49,300 | 46,900 | 44,100 | 43,000 | 41,100 | 37,200 | 34,500 | 32,900 | -11.8% | -33.3% | -4.6% |
| | CO2 emission intensity index (actual emissions) ☆ | | 0.90 | 0.97 | 1.04 | 1.00 | 1.01 | 0.99 | 0.99 | 1.22 | 1.36 | 1.36 | 1.33 | 1.28 | 1.24 | 1.19 | 1.10 | 1.06 | 1.05 | +3.9% | -22.6% | -0.9% |
| | CO2 emission intensity index (post-adjustment) | | 0.90 | 0.97 | 1.04 | 1.00 | 1.01 | 0.85 | 0.84 | 1.14 | 1.15 | 1.36 | 1.32 | 1.27 | 1.24 | 1.19 | 1.11 | 1.06 | 1.06 | +4.2% | -22.2% | -0.9% |
| | Energy consumption intensity index | | 0.94 | 0.94 | 0.94 | 0.94 | 0.95 | 0.92 | 0.92 | 0.92 | 0.92 | 0.91 | 0.90 | 0.90 | 0.90 | 0.89 | 0.88 | 0.90 | 0.89 | -6.2% | -2.7% | -0.9% |
| | Production activity index | | 1.25 | 1.28 | 1.27 | 1.31 | 1.34 | 1.33 | 1.40 | 1.33 | 1.32 | 1.32 | 1.29 | 1.26 | 1.27 | 1.26 | 1.22 | 1.18 | 1.13 | -15.4% | -14.2% | -3.8% |
| Petroleum Association of Japan | CO2 emissions (actual emissions) | | 4,062 | 4,032 | 4,075 | 4,054 | 4,154 | 3,960 | 4,004 | 3,785 | 3,820 | 4,033 | 3,824 | 3,834 | 3,845 | 3,809 | 3,682 | 3,439 | 3,082 | -25.8% | -23.6% | -10.4% |
| | CO2 emissions (post-adjustment) | | 4,062 | 4,032 | 4,075 | 4,054 | 4,154 | 3,945 | 3,987 | 3,776 | 3,796 | 4,033 | 3,823 | 3,833 | 3,844 | 3,808 | 3,682 | 3,440 | 3,082 | -25.8% | -23.6% | -10.4% |
| | CO2 emission intensity index (actual emissions) | Base year: FY1990 | 1.04 | 1.04 | 1.03 | 1.02 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.01 | 1.00 | 0.98 | 0.98 | 0.98 | 0.99 | 0.97 | 1.06 | +6.8% | +5.5% | +9.6% |
| | CO2 emission intensity index (post-adjustment) | | 1.05 | 1.05 | 1.04 | 1.03 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.01 | 1.00 | 0.99 | 0.99 | 0.98 | 0.99 | 0.97 | 1.07 | +6.8% | +5.5% | +9.6% |
| | Energy consumption | | 1,656 | 1,651 | 1,666 | 1,666 | 1,713 | 1,633 | 1,650 | 1,555 | 1,575 | 1,651 | 1,563 | 1,573 | 1,589 | 1,569 | 1,503 | 1,425 | 1,266 | -26.1% | -23.3% | -11.1% |
| | Energy consumption intensity index | Base year: FY1990 | 1.03 | 1.03 | 1.02 | 1.02 | 1.00 | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | 0.99 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 1.06 | +6.4% | +5.9% | +8.7% |
| | Production activity index | | 0.98 | 0.98 | 1.00 | 1.00 | 1.05 | 1.00 | 1.02 | 0.96 | 0.96 | 1.01 | 0.97 | 0.99 | 0.99 | 0.98 | 0.94 | 0.89 | 0.73 | -30.5% | -27.6% | -18.2% |
| The Japan Gas Association *3 | CO2 emissions (actual emissions) | | 73 | 66 | 59 | 54 | 47 | 34 | 34 | 38 | 40 | 46 | 48 | 45 | 46 | 45 | 42 | 40 | 40 | -15.4% | -12.9% | -0.1% |
| | CO2 emissions (post-adjustment) | | 73 | 66 | 59 | 54 | 47 | 32 | 31 | 36 | 36 | 46 | 48 | 44 | 46 | 45 | 43 | 40 | 40 | -15.1% | -12.5% | +0.2% |
| | CO2 emission intensity index (actual emissions) ☆ | Base year: FY1990 | 0.33 | 0.28 | 0.24 | 0.21 | 0.17 | 0.12 | 0.11 | 0.12 | 0.12 | 0.13 | 0.13 | 0.13 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | -26.5% | -6.5% | +2.2% |
| | CO2 emission intensity index (post-adjustment) | | 0.33 | 0.28 | 0.24 | 0.21 | 0.17 | 0.11 | 0.10 | 0.11 | 0.11 | 0.13 | 0.13 | 0.13 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | -26.2% | -6.1% | +2.5% |
| | Energy consumption | | 38 | 34 | 30 | 28 | 25 | 19 | 19 | 19 | 18 | 21 | 22 | 21 | 22 | 22 | 22 | 22 | 22 | -11.4% | +5.0% | +0.8% |
| | Energy consumption intensity index | Base year: FY1990 | 0.35 | 0.29 | 0.25 | 0.22 | 0.18 | 0.13 | 0.12 | 0.12 | 0.11 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.13 | 0.13 | 0.14 | -23.0% | +12.8% | +3.2% |
| | Production activity index | | 1.62 | 1.76 | 1.82 | 1.94 | 2.10 | 2.21 | 2.33 | 2.38 | 2.39 | 2.59 | 2.64 | 2.60 | 2.76 | 2.72 | 2.57 | 2.47 | 2.41 | +15.1% | -6.9% | -2.2% |
| Emissions from industrial processes *4 | CO2 emissions | | 233 | 220 | 229 | 225 | 214 | 222 | 214 | 213 | 190 | 189 | 200 | 196 | 190 | 203 | 185 | 188 | 150 | -30.1% | -20.8% | -20.3% |
| Total（Emissions before electric power distribution） | CO2 emissions (actual emissions) | | 35,368 | 38,318 | 40,462 | 40,533 | 41,715 | 40,317 | 42,452 | 48,636 | 53,450 | 53,667 | 51,071 | 48,475 | 47,281 | 45,157 | 40,910 | 38,067 | 36,071 | -13.5% | -32.8% | -5.2% |
| | CO2 emissions (post-adjustment) | | 35,368 | 38,318 | 40,462 | 40,533 | 41,715 | 34,998 | 36,733 | 45,625 | 45,722 | 53,567 | 50,971 | 48,174 | 47,080 | 45,157 | 41,110 | 38,167 | 36,172 | -13.3% | -32.5% | -5.2% |
| | Energy consumption | | 19,348 | 19,671 | 19,528 | 20,233 | 20,731 | 19,940 | 21,021 | 19,932 | 19,773 | 19,740 | 18,919 | 18,665 | 18,624 | 18,383 | 17,672 | 17,259 | 16,369 | -21.0% | -17.1% | -5.2% |

*1 Intensity indices have been calculated by having each industry set a base year, the figure for which is used as 1. Unless otherwise specified in remarks, the base year is fiscal 1990.

*2 Because the Electric Power Council for a Low Carbon Society was established in fiscal 2015, the data for fiscal years through fiscal 2006 represent only the Federation of Electric Power Companies, and the data for fiscal 2007 - 2014 include the Federation of Electric Power Companies and PPS.

*3 The data for the Japan Gas Association in and before 2012 are based on industrial boundaries defined under the Voluntary Action Plan on the Environment. The calculated $CO_2$ emissions differ from the figures dervied using the marignal adjustment method (cogeneration) that the Japan Gas Association has adopted as target indices.

*4 Emissions from industrial processes refer to $CO_2$ emissions from manufacturing processes that are not energy-oriented.

3. Commercial Sector

10,000t-$CO_2$; 10,000kl crude oil equivalent; fiscal year

| Industry | (*1) (☆: target adopted by the industry) | Notes | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Relative to FY2013 | Relative to previous FY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Japan Chain Stores Association | CO2 emissions (actual emissions) | | 646 | 668 | 692 | 783 | 540 | 496 | 395 | 284 | 220 | 209 | 206 | 209 | -61.4% | +1.5% |
| | CO2 emissions (post-adjustment) | | 552 | 569 | 646 | 662 | 540 | 495 | 393 | 283 | 220 | 209 | 206 | 210 | -61.1% | +1.9% |
| | Energy consumption | | 389 | 402 | 338 | 342 | 233 | 219 | 181 | 134 | 108 | 109 | 111 | 115 | -50.8% | +3.0% |
| Telecommunications Carriers Association | CO2 emissions (actual emissions) | | 453 | 427 | 532 | 576 | 571 | 566 | 555 | 522 | 502 | 479 | 462 | 464 | -18.6% | +0.4% |
| | CO2 emissions (post-adjustment) | | 387 | 364 | 497 | 487 | 571 | 565 | 552 | 520 | 501 | 481 | 463 | 468 | -18.1% | +0.9% |
| | Energy consumption | | 273 | 257 | 260 | 251 | 246 | 251 | 254 | 247 | 247 | 251 | 252 | 257 | +4.6% | +2.0% |
| | Energy consumption intensity index ☆ | Base year: FY2013 | | 2.38 | 1.92 | 1.47 | 1.00 | 0.77 | 0.53 | 0.35 | 0.30 | 0.25 | 0.21 | 0.15 | -85.4% | -31.9% |
| | Production activity index | | | 0.44 | 0.55 | 0.69 | 1.00 | 1.33 | 1.97 | 2.86 | 3.30 | 4.12 | 4.77 | 7.14 | +614.0% | +49.8% |
| Japan Franchise Association | CO2 emissions (actual emissions) | | | 297 | 364 | 422 | 438 | 459 | 451 | 449 | 431 | 400 | 375 | 355 | -18.8% | -5.2% |
| | CO2 emissions (post-adjustment) | | | 253 | 340 | 357 | 438 | 458 | 449 | 447 | 430 | 401 | 376 | 358 | -18.3% | -4.7% |
| | Energy consumption | | | 179 | 178 | 184 | 189 | 203 | 207 | 212 | 212 | 210 | 205 | 197 | +4.3% | -3.6% |
| Japan Department Store Association | CO2 emissions (actual emissions) | | 171 | 157 | 178 | 194 | 190 | 172 | 160 | 152 | 134 | 119 | 114 | 87 | -54.2% | -23.9% |
| | CO2 emissions (post-adjustment) | | 151 | 138 | 168 | 169 | 190 | 172 | 159 | 152 | 134 | 119 | 114 | 87 | -53.9% | -23.6% |
| | CO2 emission intensity index (actual emissions) | | 0.87 | 0.85 | 0.94 | 1.01 | 1.00 | 0.92 | 0.84 | 0.81 | 0.76 | 0.70 | 0.68 | 0.62 | -38.4% | -8.8% |
| | CO2 emission intensity index (post-adjustment) | | 0.77 | 0.75 | 0.88 | 0.88 | 1.00 | 0.92 | 0.84 | 0.81 | 0.76 | 0.70 | 0.68 | 0.62 | -38.0% | -8.5% |
| | Energy consumption | | 99 | 91 | 87 | 86 | 83 | 77 | 74 | 72 | 65 | 61 | 61 | 47 | -43.7% | -22.7% |
| | Energy consumption intensity index ☆ | Base year: FY2013 | 1.16 | 1.12 | 1.04 | 1.02 | 1.00 | 0.94 | 0.89 | 0.88 | 0.85 | 0.82 | 0.82 | 0.76 | -24.2% | -7.4% |
| | Production activity index | | 1.03 | 0.97 | 1.00 | 1.01 | 1.00 | 0.99 | 1.00 | 0.98 | 0.92 | 0.89 | 0.89 | 0.74 | -25.7% | -16.5% |
| Japan Association of Refrigerated Warehouses | CO2 emissions (actual emissions) | | 76 | 80 | 90 | 106 | 106 | 103 | 98 | 96 | 90 | 85 | 82 | 82 | -22.5% | -0.1% |
| | CO2 emissions (post-adjustment) | | 65 | 68 | 84 | 90 | 106 | 103 | 98 | 95 | 90 | 86 | 83 | 83 | -22.0% | +0.4% |
| | CO2 emission intensity index (actual emissions) | Base year: FY1990 | 0.88 | 0.92 | 1.08 | 1.22 | 1.20 | 1.15 | 1.09 | 1.06 | 1.00 | 0.92 | 0.89 | 0.85 | -29.3% | -4.4% |
| | CO2 emission intensity index (post-adjustment) | | 0.76 | 0.78 | 1.01 | 1.03 | 1.20 | 1.15 | 1.09 | 1.05 | 1.00 | 0.92 | 0.89 | 0.86 | -28.8% | -3.9% |
| | Energy consumption | | 46 | 48 | 44 | 46 | 46 | 46 | 45 | 45 | 45 | 45 | 45 | 46 | -0.5% | +1.5% |
| | Energy consumption intensity index ☆ | Base year: FY1990 | 0.83 | 0.86 | 0.82 | 0.83 | 0.81 | 0.79 | 0.78 | 0.78 | 0.77 | 0.75 | 0.75 | 0.73 | -9.1% | -2.8% |
| | Production activity index | | 1.39 | 1.40 | 1.35 | 1.40 | 1.43 | 1.45 | 1.45 | 1.45 | 1.45 | 1.50 | 1.49 | 1.56 | +9.5% | +4.5% |
| Japanese Bankers Association | CO2 emissions (actual emissions) | | 121 | 122 | 130 | 141 | 139 | 134 | 127 | 120 | 112 | 100 | 91 | 88 | -36.8% | -3.7% |
| | CO2 emissions (post-adjustment) | | 104 | 104 | 122 | 119 | 139 | 134 | 126 | 119 | 112 | 100 | 92 | 89 | -36.4% | -3.2% |
| | Energy consumption | | 73 | 73 | 64 | 62 | 60 | 59 | 58 | 57 | 55 | 52 | 50 | 49 | -18.8% | -2.1% |
| | Electric power consumption intensity (power consumption / total floor area) ☆ | Base year: FY2009 | 1.00 | 0.99 | 0.86 | 0.84 | 0.83 | 0.82 | 0.80 | 0.78 | 0.76 | 0.74 | 0.71 | 0.70 | -16.3% | -1.8% |
| The Life Insurance Association of Japan | CO2 emissions (actual emissions) | | 104 | 101 | 108 | 116 | 111 | 102 | 96 | 85 | 80 | 72 | 67 | 62 | -43.8% | -6.5% |
| | CO2 emissions (post-adjustment) | | 90 | 88 | 102 | 99 | 111 | 102 | 96 | 85 | 80 | 73 | 67 | 63 | -43.4% | -6.1% |
| | Energy consumption | | 61 | 60 | 53 | 51 | 48 | 45 | 44 | 40 | 39 | 38 | 36 | 34 | -28.7% | -5.0% |
| | Production activity index | Base year: FY2009 | 1.00 | 0.96 | 0.97 | 0.94 | 0.91 | 0.89 | 0.89 | 0.88 | 0.86 | 0.85 | 0.85 | 0.85 | -7.1% | +0.2% |
| Japan Foreign Trade Council, Inc. | CO2 emissions (actual emissions) | | 5 | 5 | 5 | 6 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 | -48.7% | -12.9% |
| | CO2 emissions (post-adjustment) | | 4 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 | -48.4% | -12.5% |
| | Energy consumption | | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | -35.0% | -11.6% |
| | Electric power consumption intensity (power consumption poer unit floor area in entire company) ☆ | Base year: FY2013 | 1.23 | 1.26 | 1.06 | 1.02 | 1.00 | 0.97 | 0.94 | 0.90 | 0.89 | 0.87 | 0.87 | 0.74 | -25.7% | -14.4% |
| The General Insurance Association of Japan | CO2 emissions (actual emissions) | | 26 | 26 | 27 | 29 | 29 | 27 | 25 | 24 | 21 | 20 | 18 | 18 | -38.8% | -3.8% |
| | CO2 emissions (post-adjustment) | | 23 | 22 | 26 | 25 | 29 | 27 | 25 | 24 | 21 | 20 | 18 | 18 | -38.5% | -3.2% |
| | Energy consumption | | 16 | 15 | 13 | 13 | 12 | 12 | 11 | 11 | 11 | 10 | 10 | 10 | -22.7% | -2.1% |
| | Electric power consumption intensity (power consumption/total floor area) ☆ | Base year: FY2009 | 1.00 | 1.01 | 0.87 | 0.85 | 0.85 | 0.87 | 0.84 | 0.84 | 0.82 | 0.83 | 0.73 | 0.72 | -15.5% | -1.5% |
| | Production activity index | | 1.00 | 0.98 | 0.98 | 0.97 | 0.95 | 0.91 | 0.89 | 0.87 | 0.84 | 0.83 | 0.89 | 0.89 | -6.6% | -0.4% |
| Japan LP Gas Association | CO2 emissions (actual emissions) | | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | -24.5% | -1.3% |
| | CO2 emissions (post-adjustment) | | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | -24.0% | -0.9% |
| | CO2 emission intensity index (actual emissions) | Base year: FY2010 | 1.00 | 1.00 | 1.19 | 1.43 | 1.48 | 1.40 | 1.45 | 1.36 | 1.35 | 1.18 | 1.13 | 1.12 | -24.1% | -0.5% |
| | CO2 emission intensity index (post-adjustment) | | 1.00 | 1.00 | 1.30 | 1.41 | 1.73 | 1.64 | 1.69 | 1.59 | 1.58 | 1.39 | 1.32 | 1.32 | -23.5% | -0.0% |
| | Energy consumption ☆ | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | -3.0% | +0.3% |
| | Energy consumption intensity index | Base year: FY2010 | 1.00 | 1.00 | 0.97 | 1.03 | 1.06 | 1.03 | 1.10 | 1.07 | 1.10 | 1.03 | 1.02 | 1.03 | -2.4% | +1.1% |
| | Production activity index | | 0.99 | 1.00 | 1.02 | 0.94 | 0.88 | 0.89 | 0.82 | 0.86 | 0.84 | 0.88 | 0.88 | 0.88 | -0.6% | -0.9% |
| The Real Estate Companies Association of Japan | CO2 emission intensity index (actual emissions) | Base year: FY2005 | 0.87 | 0.86 | 0.89 | 0.97 | 1.00 | 0.94 | 0.87 | 0.87 | 0.86 | 0.78 | 0.76 | 0.67 | -32.9% | -11.6% |
| | CO2 emission intensity index (post-adjustment) | | 0.76 | 0.75 | 0.84 | 0.85 | 1.00 | 0.93 | 0.87 | 0.86 | 0.86 | 0.78 | 0.76 | 0.67 | -32.6% | -11.4% |
| | Energy consumption intensity index ☆ | | 0.89 | 0.88 | 0.79 | 0.79 | 0.79 | 0.76 | 0.75 | 0.74 | 0.76 | 0.73 | 0.73 | 0.68 | -14.8% | -7.2% |
| Japan Building Owners and Managers Association | Energy consumption [MJ/m2 year] | | 2,019 | | | | 1,833 | 1,743 | 1,722 | 1,754 | 1,722 | 1,709 | 1,696 | 1,579 | -13.8% | -6.9% |
| | Energy consumption intensity index | | 1.00 | | | | 0.91 | 0.86 | 0.85 | 0.87 | 0.85 | 0.85 | 0.84 | 0.78 | -14.0% | -6.9% |
| Japan Securities Dealers Association | CO2 emissions (actual emissions) | | 19 | 19 | 19 | 20 | 19 | 18 | 17 | 16 | 15 | 13 | 12 | 11 | -42.2% | -8.1% |
| | CO2 emissions (post-adjustment) | | 16 | 16 | 18 | 17 | 19 | 18 | 17 | 16 | 15 | 14 | 12 | 11 | -41.8% | -7.7% |
| | Energy consumption | | 12 | 11 | 9 | 9 | 8 | 8 | 8 | 8 | 7 | 7 | 7 | 6 | -25.7% | -6.6% |
| | Electric power consumption per unit floor area ☆ | [kWh/㎡] | 241 | 243 | 203 | 195 | 189 | 185 | 180 | 174 | 170 | 165 | 159 | 152 | -19.6% | -4.0% |
| Japan Hotel Association | CO2 emissions (actual emissions) | | | 55 | 59 | 63 | 63 | 60 | 57 | 55 | 54 | 51 | 47 | 36 | -42.7% | -24.2% |
| | CO2 emissions (post-adjustment) | | | 50 | 56 | 57 | 63 | 60 | 57 | 55 | 54 | 51 | 48 | 36 | -42.4% | -24.0% |
| | Energy consumption | | | 35 | 32 | 32 | 32 | 31 | 30 | 30 | 29 | 28 | 22 | 31 | -31.7% | -23.6% |
| | Energy consumption intensity index ☆ | Base year: FY2010 | | 1.00 | 0.94 | 0.94 | 0.93 | 0.90 | 0.88 | 0.88 | 0.88 | 0.86 | 0.83 | 0.71 | -23.7% | -15.4% |
| | Production activity index | | | 1.00 | 1.01 | 1.01 | 1.02 | 1.02 | 1.02 | 1.02 | 1.02 | 1.02 | 1.01 | 0.97 | -4.4% | -4.0% |
| Telecom Services Association | CO2 emissions (actual emissions) | | | | | | 102 | 96 | 90 | 90 | 81 | 77 | 78 | 80 | -21.5% | +3.2% |
| | CO2 emissions (post-adjustment) | | | | | | 102 | 96 | 89 | 89 | 81 | 77 | 78 | 81 | -21.0% | +3.7% |
| | Energy consumption | | | | | | 44 | 43 | 41 | 42 | 40 | 40 | 42 | 44 | +0.8% | +4.9% |
| | Energy consumption intensity index ☆ | Base year: FY2013 | | | | | 1.00 | 0.97 | 0.94 | 0.96 | 0.91 | 0.90 | 0.91 | 0.93 | -6.6% | +2.3% |
| | Production activity index | | | | | | 1.00 | 0.99 | 1.00 | 1.00 | 1.00 | 1.01 | 1.05 | 1.08 | +7.9% | +2.5% |
| Japan Internet Providers Association | CO2 emissions (actual emissions) | | | | | | | | 6 | 5 | 8 | 6 | 6 | 5 | | -12.1% |
| | CO2 emissions (post-adjustment) | | | | | | | | 6 | 5 | 8 | 6 | 6 | 5 | | -11.7% |
| | Energy consumption | | | | | | | | 3 | 3 | 4 | 3 | 3 | 3 | | -10.7% |
| | Energy consumption intensity index ☆ | Base year: FY2015 | | | | | | | 1.00 | 0.83 | 1.30 | 0.93 | 0.92 | 0.75 | | -18.7% |
| Revisions | CO2 emissions (actual emissions) | | | | | | | | | | | | | | | |
| | CO2 emissions (post-adjustment) | | | | | | | | | | | | | | | |
| | Energy consumption | | | | | | | | | | | | | | | |
| Total *1 | CO2 emissions (actual emissions) | | 1,625 | 1,959 | 2,210 | 2,460 | 2,316 | 2,242 | 2,085 | 1,906 | 1,755 | 1,636 | 1,564 | 1,503 | -35.1% | -3.9% |
| | CO2 emissions (post-adjustment) | | 1,395 | 1,679 | 2,066 | 2,089 | 2,316 | 2,239 | 2,073 | 1,899 | 1,751 | 1,643 | 1,567 | 1,513 | -34.7% | -3.5% |
| | Energy consumption | | 972 | 1,175 | 1,082 | 1,080 | 1,006 | 997 | 960 | 904 | 866 | 859 | 853 | 832 | -17.3% | -2.4% |

*1 Intensity indices have been calculated by having each industry set a base year, the figure for which is used as 1. Unless otherwise specified in remarks, the base year is fiscal 1990.

4. Transportation Sector

10,000t-$CO_2$; 10,000kl crude oil equivalent; fiscal year

| Industry | (*1) (☆: target adopted by the industry) | Note | 2005 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Relative to FY2005 | Relative to FY2013 | Relative to previous FY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| The Japanese Shipowners' Association | CO2 emissions (actual emissions) | | 5,574 | 5,751 | 5,769 | 5,673 | 5,499 | 5,539 | 5,417 | 5,215 | 5,258 | 5,402 | 3,266 | 4,563 | 4,024 | -27.8% | -27.4% | -11.8% |
| | CO2 emissions (post-adjustment) | | 5,574 | 5,751 | 5,769 | 5,673 | 5,499 | 5,539 | 5,417 | 5,215 | 5,258 | 5,402 | 3,266 | 4,563 | 4,024 | -27.8% | -27.4% | -11.8% |
| | CO2 emission intensity index (actual emissions) | Base year: | 0.88 | 0.82 | 0.83 | 0.77 | 0.73 | 0.62 | 0.57 | 0.59 | 0.61 | 0.61 | 0.63 | 0.69 | 0.65 | -25.9% | +5.5% | -6.3% |
| | ☆ CO2 emission intensity index (post-adjustment) | FY1990 | 0.88 | 0.82 | 0.83 | 0.77 | 0.73 | 0.62 | 0.57 | 0.59 | 0.61 | 0.61 | 0.63 | 0.69 | 0.65 | -25.9% | +5.5% | -6.3% |
| | Energy consumption | | 2,012 | 2,076 | 2,083 | 2,048 | 1,986 | 1,931 | 1,889 | 1,821 | 1,836 | 1,887 | 1,140 | 1,594 | 1,405 | -30.2% | -27.2% | -11.9% |
| | Energy consumption intensity index | Base year: | 0.88 | 0.82 | 0.83 | 0.77 | 0.73 | 0.59 | 0.55 | 0.57 | 0.59 | 0.59 | 0.61 | 0.67 | 0.63 | -28.4% | +5.7% | -6.3% |
| | Production activity index | FY1990 | 1.65 | 1.81 | 1.79 | 1.91 | 1.95 | 2.33 | 2.48 | 2.28 | 2.22 | 2.31 | 1.34 | 1.71 | 1.61 | -2.5% | -31.1% | -5.9% |
| Japan Trucking Association | CO2 emissions (actual emissions) | | 4,720 | 4,470 | 4,337 | 4,161 | 4,101 | 4,079 | 4,100 | 4,091 | 4,068 | 4,087 | 4,104 | 4,044 | 3,874 | -17.9% | -5.0% | -4.2% |
| | CO2 emissions (post-adjustment) | | 4,720 | 4,470 | 4,337 | 4,161 | 4,101 | 4,079 | 4,100 | 4,091 | 4,068 | 4,087 | 4,104 | 4,044 | 3,874 | -17.9% | -5.0% | -4.2% |
| | CO2 emission intensity index (actual emissions) | Base year: | 1.00 | 0.94 | 0.83 | 0.84 | 0.94 | 0.91 | 0.93 | 0.96 | 0.93 | 0.93 | 0.93 | 0.90 | 1.03 | +3.0% | +13.0% | +14.8% |
| | ☆ CO2 emission intensity index (post-adjustment) | 1996 | 1.00 | 0.94 | 0.83 | 0.84 | 0.94 | 0.91 | 0.93 | 0.96 | 0.93 | 0.93 | 0.93 | 0.90 | 1.03 | +3.0% | +13.0% | +14.8% |
| | Energy consumption | | 1,776 | 1,682 | 1,632 | 1,566 | 1,543 | 1,527 | 1,534 | 1,531 | 1,523 | 1,530 | 1,536 | 1,514 | 1,450 | -18.4% | -5.0% | -4.2% |
| | Energy consumption intensity index | Base year: | 1.00 | 0.94 | 0.83 | 0.84 | 0.94 | 0.91 | 0.93 | 0.96 | 0.93 | 0.92 | 0.93 | 0.89 | 1.02 | +2.5% | +13.0% | +14.8% |
| | Production activity index | 1996 | 1.00 | 1.01 | 1.11 | 1.05 | 0.93 | 0.95 | 0.93 | 0.90 | 0.93 | 0.93 | 0.93 | 0.95 | 0.80 | -20.4% | -16.0% | -16.5% |
| The Scheduled Airlines Association of Japan | CO2 emissions (actual emissions) | | 2,667 | 2,135 | 1,943 | 1,814 | 1,959 | 2,056 | 2,167 | 2,218 | 2,305 | 2,388 | 2,476 | 2,516 | 1,260 | -52.8% | -38.7% | -49.9% |
| | CO2 emissions (post-adjustment) | | 2,667 | 2,135 | 1,943 | 1,814 | 1,959 | 2,056 | 2,167 | 2,218 | 2,305 | 2,388 | 2,476 | 2,516 | 1,260 | -52.8% | -38.7% | -49.9% |
| | CO2 emission intensity index (actual emissions) | Base year: | 1.00 | 0.93 | 0.88 | 0.89 | 0.90 | 0.89 | 0.85 | 0.85 | 0.82 | 0.80 | 0.84 | 0.85 | 0.94 | -6.0% | +5.6% | +10.0% |
| | ☆ CO2 emission intensity index (post-adjustment) | 2005 | 1.00 | 0.93 | 0.88 | 0.89 | 0.90 | 0.89 | 0.85 | 0.85 | 0.82 | 0.80 | 0.84 | 0.85 | 0.94 | -6.0% | +5.6% | +10.0% |
| | Energy consumption | | 1,026 | 821 | 747 | 697 | 753 | 778 | 820 | 839 | 872 | 903 | 937 | 952 | 477 | -53.5% | -38.7% | -49.9% |
| | Energy consumption intensity index | Base year: | 1.00 | 0.93 | 0.88 | 0.89 | 0.90 | 0.88 | 0.84 | 0.84 | 0.81 | 0.78 | 0.82 | 0.84 | 0.93 | -7.5% | +5.6% | +10.0% |
| | Production activity index | 2005 | 1.00 | 0.86 | 0.83 | 0.76 | 0.82 | 0.87 | 0.95 | 0.98 | 1.05 | 1.12 | 1.11 | 1.10 | 0.50 | -49.8% | -42.0% | -54.4% |
| Japan Federation of Coastal Shipping Associations | CO2 emissions (actual emissions) | | 789 | 655 | 704 | 686 | 704 | 722 | 726 | 704 | 713 | 703 | 707 | 700 | 666 | -15.7% | -7.8% | -4.9% |
| | ☆ CO2 emissions (post-adjustment) | | 789 | 655 | 704 | 686 | 704 | 722 | 726 | 704 | 713 | 703 | 707 | 700 | 666 | -15.7% | -7.8% | -4.9% |
| | CO2 emission intensity index (actual emissions) | Base year: | 1.04 | 1.09 | 1.09 | 1.10 | 1.11 | 1.09 | 1.11 | 1.09 | 1.11 | 1.09 | 1.10 | 1.15 | 1.21 | +16.1% | +10.8% | +5.0% |
| | CO2 emission intensity index (post-adjustment) | FY1990 | 1.04 | 1.09 | 1.09 | 1.10 | 1.11 | 1.09 | 1.11 | 1.09 | 1.11 | 1.09 | 1.10 | 1.15 | 1.21 | +16.1% | +10.8% | +5.0% |
| | Energy consumption | | 288 | 239 | 256 | 250 | 256 | 255 | 256 | 249 | 252 | 248 | 250 | 248 | 236 | -18.2% | -7.6% | -4.8% |
| | Energy consumption intensity index | Base year: | 1.04 | 1.09 | 1.09 | 1.09 | 1.10 | 1.06 | 1.07 | 1.05 | 1.07 | 1.05 | 1.07 | 1.12 | 1.17 | +12.7% | +11.1% | +5.1% |
| | Production activity index | FY1990 | 0.88 | 0.70 | 0.75 | 0.73 | 0.74 | 0.77 | 0.76 | 0.75 | 0.75 | 0.75 | 0.75 | 0.71 | 0.64 | -27.4% | -16.8% | -9.4% |
| The Association of Japanese Private Railways | CO2 emissions (actual emissions) | | | | 216 | 258 | 289 | 286 | 274 | 263 | 257 | 246 | 227 | 215 | 204 | | -28.6% | -5.2% |
| | CO2 emissions (post-adjustment) | | | | 184 | 240 | 244 | 286 | 274 | 261 | 256 | 245 | 228 | 216 | 205 | | -28.1% | -4.7% |
| | Energy consumption | | | | 130 | 126 | 126 | 123 | 121 | 120 | 121 | 121 | 119 | 117 | 113 | | -8.3% | -3.7% |
| | Energy consumption intensity index | Base year: | | | 1.00 | 0.98 | 0.97 | 0.94 | 0.93 | 0.92 | 0.92 | 0.92 | 0.90 | 0.88 | 0.86 | | -9.4% | -3.0% |
| | Production activity index | FY2010 | | | 1.00 | 0.99 | 1.00 | 1.00 | 1.01 | 1.01 | 1.01 | 1.01 | 1.02 | 1.02 | 1.02 | | +1.2% | -0.7% |
| East Japan Railway Company | CO2 emissions (actual emissions) | Base year: | | 282 | 241 | 202 | 234 | 234 | 224 | 216 | 220 | 215 | 209 | 201 | 196 | | -16.2% | -2.5% |
| | CO2 emissions (post-adjustment) | FY2013 | | 254 | 215 | 188 | 233 | 215 | 223 | 216 | 218 | 212 | 206 | 199 | 194 | | -9.8% | -2.5% |
| | Energy consumption ☆ | 100 million MJ | | 536 | 527 | 517 | 523 | 517 | 511 | 508 | 502 | 506 | 495 | 480 | 473 | | -8.5% | -1.5% |
| | Energy consumption intensity index | (Shinkansen) | | 2.64 | 2.71 | 2.60 | 2.62 | 2.49 | 2.51 | 2.45 | 2.44 | 2.44 | 2.41 | 2.39 | 2.31 | | -7.2% | -3.3% |
| | Production activity index | (Shinkansen) | | 0.90 | 0.87 | 0.89 | 0.97 | 1.00 | 1.04 | 1.12 | 1.13 | 1.15 | 1.18 | 1.16 | 1.13 | | +13.0% | -2.6% |
| | Energy consumption intensity index | (Conventional Lines) | | 1.62 | 1.65 | 1.61 | 1.63 | 1.59 | 1.55 | 1.50 | 1.49 | 1.50 | 1.50 | 1.49 | 1.47 | | -7.5% | -1.3% |
| | Production activity index | (Conventional Lines) | | 1.02 | 1.00 | 0.99 | 1.00 | 1.00 | 1.00 | 1.01 | 1.00 | 1.00 | 1.00 | 1.00 | 0.99 | | -1.0% | -1.0% |
| Shikoku Railway Company | CO2 emissions (actual emissions) | | 8 | 8 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 7 | 7 | 7 | 7 | -21.2% | -17.7% | -4.7% |
| | CO2 emissions (post-adjustment) | | 8 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 7 | 7 | 7 | 7 | -21.1% | -17.5% | -4.5% |
| | CO2 emission intensity index (actual emissions) | Base year: | 1.05 | 0.98 | 1.00 | 1.04 | 1.13 | 1.14 | 1.11 | 1.09 | 1.08 | 1.05 | 1.01 | 0.95 | 0.99 | -5.9% | -12.9% | +4.7% |
| | CO2 emission intensity index (post-adjustment) | FY2010 | 1.11 | 0.98 | 1.00 | 1.07 | 1.11 | 1.20 | 1.17 | 1.15 | 1.13 | 1.10 | 1.06 | 1.00 | 1.04 | -5.6% | -12.7% | +4.9% |
| | Energy consumption ☆ | | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | -21.7% | -8.9% | -4.2% |
| | Energy consumption intensity index | Base year: | 1.03 | 0.97 | 1.00 | 0.97 | 1.00 | 1.00 | 0.99 | 0.98 | 0.99 | 0.98 | 0.96 | 0.92 | 0.96 | -6.4% | -3.6% | +5.2% |
| | Production activity index | FY2010 | 1.07 | 1.06 | 1.00 | 0.96 | 0.95 | 0.95 | 0.93 | 0.95 | 0.95 | 0.95 | 0.92 | 0.98 | 0.89 | -16.3% | -5.5% | -9.0% |
| All Japan Freight Forwarders Association | CO2 emissions (actual emissions) | Base year: | 14 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 12 | 12 | 12 | 12 | 11 | -22.1% | -15.2% | -8.8% |
| | ☆ CO2 emissions (post-adjustment) | FY2009 | 14 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 12 | 12 | 12 | 12 | 11 | -22.1% | -15.2% | -8.8% |
| | Production activity index | | 1.13 | 1.00 | 1.01 | 0.96 | 1.01 | 1.06 | 1.06 | 1.09 | 1.08 | 1.10 | 1.00 | 1.02 | 0.93 | -18.1% | -12.5% | -9.3% |
| Revisions *2 | CO2 emissions (actual emissions) | | 249 | 238 | 233 | 318 | 347 | 414 | 404 | 394 | 382 | 367 | 331 | 328 | 301 | +21.0% | -27.1% | -8.1% |
| | CO2 emissions (post-adjustment) | | 249 | 205 | 201 | 298 | 296 | 414 | 403 | 392 | 380 | 367 | 332 | 329 | 303 | +21.8% | -26.6% | -7.7% |
| Total *3 | CO2 emissions (actual emissions) | | 14,022 | 13,550 | 13,462 | 13,131 | 13,154 | 13,350 | 13,333 | 13,121 | 13,223 | 13,428 | 11,338 | 12,586 | 10,543 | -28.2% | -21.0% | -16.2% |
| | CO2 emissions (post-adjustment) | | 14,022 | 13,490 | 13,372 | 13,079 | 13,057 | 13,331 | 13,330 | 13,117 | 13,219 | 13,423 | 11,338 | 12,585 | 10,544 | -28.2% | -20.9% | -16.2% |
| | Energy consumption | | 5,219 | 5,467 | 5,487 | 5,333 | 5,315 | 5,285 | 5,286 | 5,223 | 5,259 | 5,348 | 4,622 | 5,054 | 4,294 | -29.7% | -18.7% | -15.0% |

*1 Intensity indices have been calculated by having each industry set a base year, the figure for which is used as 1. Unless otherwise specified in remarks, the base year is fiscal 1990.
*2 The total value of closed participant companies (West Japan Railway Company, Central Japan Railway Company, Kyushu Railway Company, Japan Freight Railway Company) lists it in Revisions.
*3 The rate of change from fiscal 2005 to fiscal 2020 is calculated except for industries with no data for fiscal 2005.