2024

Transport and Environment in Japan

Publisher Foundation for Promoting Personal Mobility and Ecological Transportation

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This document is a tentative translation by the Foundation for Promoting Personal Mobility and Ecological Transportation (Eco-Mo Foundation) of "Transport and Environment in Japan 2024", published in March 2024 by the Eco-Mo Foundation under the editorial supervision of the Environmental Policy Division, Policy Bureau, Ministry of Land, Infrastructure, Transport and Tourism (MLIT).

Initial translation was performed by a translation company, with necessary revisions made afterwards. Unique terminology and phrases which cannot be understood without knowledge of the societal background and conditions involved in the Japanese transport environment have been replaced with appropriate English expressions without being constrained by the original Japanese expressions. However, no additional explanations or additional text has been inserted, and, wherever possible, the tentative translation is faithful to the original text.

This document is published on the Eco-Mo Foundation website (http://www.ecomo.or.jp/) and available for download. We hope that it may serve of assistance with the implementation of transport environment measures in the reader's own country.

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Ⅰ. Developments Related to Environmental Issues in 2023

There were a great deal of developments in 2023, both inside Japan and overseas, related to environmental issues. Below are some of the developments in global warming.

■Global warming related developments

With regard to the framework for 2020 and beyond that relates to global warming countermeasures, an ad hoc working group was established at COP17, which was held in Durban, South Africa in November and December, 2011, and consensus was reached regarding the formulation by 2015 of a new framework which would apply to all countries.

Japan decided on by the Global Warming Prevention Headquarters Japan's Intended Nationally Determined Contribution (greenhouse gas reduction targets, etc. for 2020 and beyond) in July 2015, and submitted it to the UNFCCC secretariat. Under this INDC, Japan's emissions reduction target was defined as a 26.0% reduction in FY2030 compared to FY2013 (25.4% reduction compared to FY2005) (approximately 1,042 million tons of CO_2).

COP21 was held from November 30 to December 13, 2015, in Paris, France. At the conference, the "Paris Agreement", a new legal framework for global warming countermeasures from 2020 onwards was adopted and went into effect on November 4, 2016.

On May 13, 2016, the Japanese cabinet approved the Global Warming Countermeasure Plan, aimed at comprehensively and systematically promoting global warming countermeasures.

This plan indicates measures to be taken by each entity as well as by the government for the interim goal of reducing 26% by FY2030 compared to FY2013 level and provides a roadmap for achieving the long-term goal of reducing 80% by the year 2050.

It includes comprehensive transport sector measures such as automobile and road traffic flow measures, the promotion of public transport usage, and logistics efficiency improvements.

Furthermore, in Japan, the Cabinet issued a decision titled "Japan's Long-term Strategy under the Paris Agreement" on June 11, 2019, a long-term strategy for the development with low greenhouse gas emissions based on the Paris Agreement, and submitted it to the convention secretariat.

COP25 was held in Madrid, Spain, in December 2019, and although deliberation continued regarding the implementation approach to use for market mechanisms, it was unanimously agreed to encourage signatory countries to take ambitious climate change measures. It set in motion a framework under which all countries will regularly update their greenhouse gas reduction targets and work toward achieving them.

As "carbon neutrality by 2050" has become a global trend, Japan declared that it would aim to become carbon neutral by 2050 in October 2020, set a new greenhouse gas reduction target for FY2030 of 46% below FY2013 level (about 760 million tons of CO_2), and continue to strive to reach the 50%-reduction target.

In October 2021, Japan revised the "Plan for Global Warming Prevention," the "Basic Energy Plan," and the "Long-term Growth Strategy under the Paris Agreement," and submitted new targets for reducing Japan's greenhouse gas emissions under the Paris Agreement.

At COP26, which took place in Glasgow, UK, from the end of October through November, the "Glasgow Climate Pact" was accepted, specifying that efforts to limit the increase in global average temperature to 1.5℃ should be pursued.

At COP27 held in November 2022 in Sharm el-Sheikh, Egypt, it was decided to take measures to support loss and damage and to establish Loss and Damage Fund (tentative name) as part of such measures, in addition to the adoption of the "Sharm el-Sheikh Implementation Plan," which calls for increased efforts in various areas of climate change measures, and the "Mitigation Work Plan" to achieve mitigation ambition and improve its implementation up to 2030.

At COP28, held in November-December 2023 in Dubai, United Arab Emirates, decision on the operationalization of the new funding arrangements, including a fund, for responding to loss and damage, which elaborates on their basic institutional design was adopted. Additionally, decision on the Global Stocktake, which assesses the world's collective progress toward achieving the objectives of the Paris Agreement was adopted. The decision emphasizes the need for urgent action to achieve the 1.5°C goal, peaking out global greenhouse gas emissions at the latest before 2025, setting economy-wide emission reduction targets covering all greenhouse gases, and sectoral contributions taking into account different national circumstances, pathways and approaches.

Ⅱ. Current Status of Major Environmental Problems of the Transport Sector

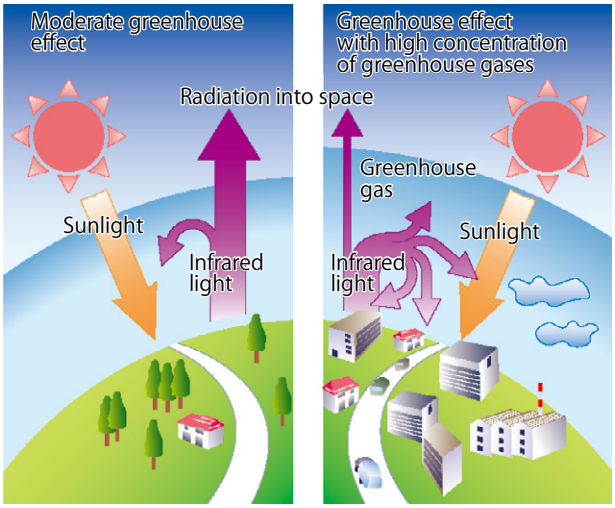
1 Current status of global environmental problems

Our globe is facing severe environmental problems, such as global warming and the destruction of the ozone layer. For the next generation to receive a planet in which they can live in security, our generation must rapidly implement countermeasures to these problems.

(1) Current status of global warming

■The mechanism behind and impact of global warming

●Mechanism of the greenhouse effect



In order to produce energy, we burn fossil fuels such as petroleum, coal, and natural gas, generating gases such as carbon dioxide (CO_2) and releasing them into the atmosphere.

Atmospheric gases such as carbon dioxide are transparent to a great deal of the light from the sun, and infrared radiation released from the earth's surface. This results in a warming of the atmosphere. They act like the glass in a greenhouse, raising the earth's temperature. These gases, which have kept temperatures in the range suited for life on earth, are called greenhouse gases.

However, factors such as the rise of industry have increased the amount of daily activity, producing a rapid rise in the amount of greenhouse gases emitted into the atmosphere. This has intensified the greenhouse effect, producing a commensurate increase in climate temperature. This is called global warming. With regard to the causal link between human activities and global warming, the Intergovernmental Panel on Climate Change (IPCC) stated that "It is unequivocal that human influence has warmed the atmosphere, ocean and land." in the Working Group I Report (The Physical Science Basis) of the Sixth Assessment Report released in August 2021. The report also indicated that the global surface temperature for 2011-2020 was 1.09 [0.95 - 1.20] ℃ higher than that in the pre-industrial era (1850 - 1900), and the temperature over land (1.59 [1.34 - 1.83] ℃) was higher than that over the ocean (0.88 [0.68 - 1.01] ℃).

As global consumption of fossil fuels continues to increase, atmospheric concentrations of greenhouse gases will further increase, leading to global warming. The IPCC report states that the global average temperature change by the end of the 21st century compared to the pre-industrial era (1850–1900) is very likely to be within the range of 1.0–1.8° C under a scenario with very low greenhouse gas emissions (SSP1-1.9) and within 3.3–5.7° C under a scenario with very high greenhouse gas emissions (SSP5-8.5). Additionally, relative to the period 1995–2014, the projected rise in global mean sea level by the end of the 21st century will likely be within 0.28–0.55 meters under the very low greenhouse gas emissions scenario (SSP1-1.9) and within 0.63–1.01 meters under the very high greenhouse gas emissions scenario (SSP5-8.5). Global warming is expected to increase the frequency and intensity of extreme weather events, and it is noted that, compared to pre-industrial conditions, the extreme weather events that have occurred once every 10 years will likely be 9.4 times more in frequency and 5.1℃ more in intensity for extreme terrestrial temperatures, 2.7 times more in frequency and 30.2% more in intensity for heavy terrestrial precipitation events, and 4.1 times more in frequency with intensity greater by 1.0 standard deviation for agricultural and ecological droughts in arid regions in a world with temperatures increased by 4℃ on average.

In the Paris Agreement, which was achieved at the 21st Conference of Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC) in 2015, it was stipulated that the increase in global average temperature should be well maintained within 2℃ compared to level during the pre-industrial era, and that efforts to limit the increase to 1.5℃ should be continued. In November 2021, the Glasgow Climate Pact was accepted at COP26 held in Glasgow, UK. In this pact, they agreed that efforts should be made to limit the increase in global average temperature to 1.5℃ (Paris Agreement) and for that global carbon neutrality should be achieved by the middle of this century. This will accelerate the movement toward carbon neutrality in the entire world.

●Forecast of increase in average global surface temperature

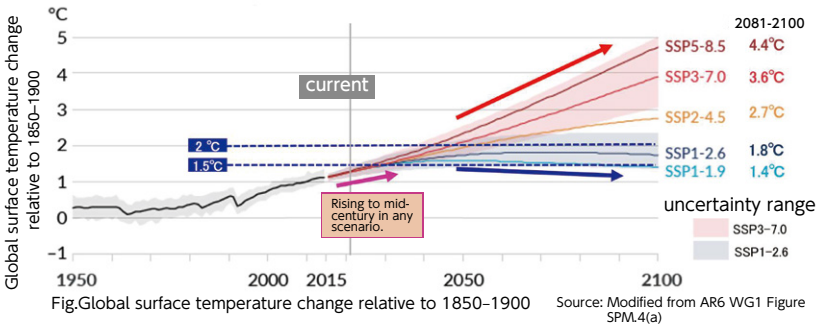


Fig.Global surface temperature change relative to 1850–1900 Source: Modified from AR6 WG1 Figure SPM.4(a)

Scenario	Description of the Scenario [Closest RCP Scenarios]
SSP5-8.5	No additional climate policy under the fossil-fuelled socio-economic development pathway. CO_2 emissions roughly double from current levels by 2050. [RCP8.5]
SSP3-7.0	No additional climate policy under the regional rivalry development narrative. It has particularly high non-CO_2 emissions, including high aerosols emissions. CO_2 emissions roughly double from current levels by 2100. [Between RCP6.0 and RCP8.5]
SSP2-4.5	Introducing climate policies under a path of moderate development. It is approximately in line with the upper end of aggregate NDC emissions levels by 2030. CO_2 emissions remaining around current levels until the middle of the century. [RCP 4.5 (also close to RCP 6.0 through 2050)]
SSP1-2.6	Introducing climate policies to stays below 2.0 ℃ warming relative to 1850–1900 (median) under the sustainability development with implied net zero CO_2 emissions in the second half of the century. [RCP2.6]
SSP1-1.9	Introducing climate policies to hold warming to approximately 1.5 ℃ above 1850–1900 in 2100 after slight overshoot (median) under the sustainability development with implied net zero CO_2 emissions around the middle of the century. [Not applicable]

Created from AR6 WG1 1.6.1.1 and Cross-Chapter Box 1.4 Table 1, Box SPM.1.1.

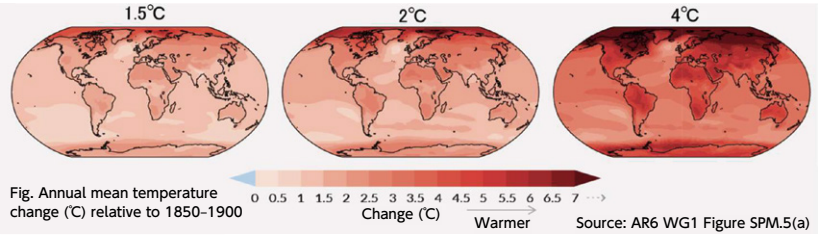


Fig. Annual mean temperature change (℃) relative to 1850–1900 Source: AR6 WG1 Figure SPM.5(a)

Annual average temperature

- ✓ It is virtually certain that the land surface will continue to warm more than the ocean surface (likely 1.4 to 1.7 times more).
- ✓ It is virtually certain that the Arctic will continue to warm more than global surface temperature, with high confidence above two times the rate of global warming.

(AR6 WG1 SPM B2.1)

Source: Ministry of Environment (MOE) "Overview of IPCC 6th assessment" (Tentative translation by Eco-Mo Foundation)

■Impact of individual greenhouse gases on global warming

In addition to carbon dioxide, greenhouse gases which cause global warming include methane, nitrous oxide, and chlorofluorocarbon. According to the IPCC, the greenhouse effects per unit of volume of methane, nitrous oxide, and chlorofluorocarbon, etc., are far stronger than those of carbon dioxide, but the amount of carbon dioxide being emitted is tremendous, so carbon dioxide emissions worldwide since the industrial revolution account for roughly 60% of all greenhouse gas contributions to global warming.

For Japan, in FY2021 carbon dioxide accounted for 91% of all greenhouse gas contributions to global warming, an extremely high figure.

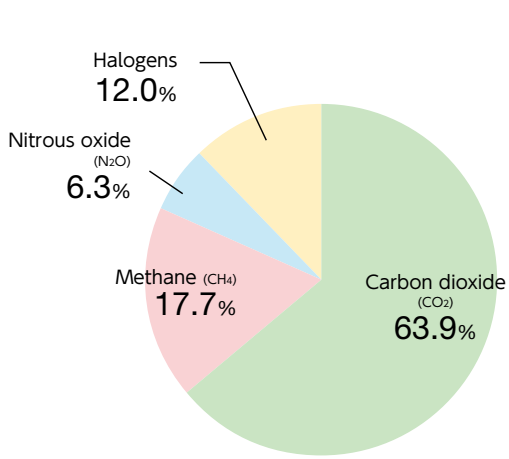
●Greenhouse gas and global warming potential (100 year period)(*1)

	Carbon dioxide	Methane	Nitrous oxide	HFC(*2)	PFC(*3)	SF_6
Global warming potential (100 year cumulative period)	1	27.9	273	1,530	8,620	24,300

*1: Global warming potential Warming effect of greenhouse gases over a 100 year period (using carbon dioxide as a baseline with a value of 1)
*2: HFC Calculated for HFC-134a, a typical HFC used as a coolant
*3: PFC Calculated for PFC-5-1-14, a typical PFC used in rectifiers

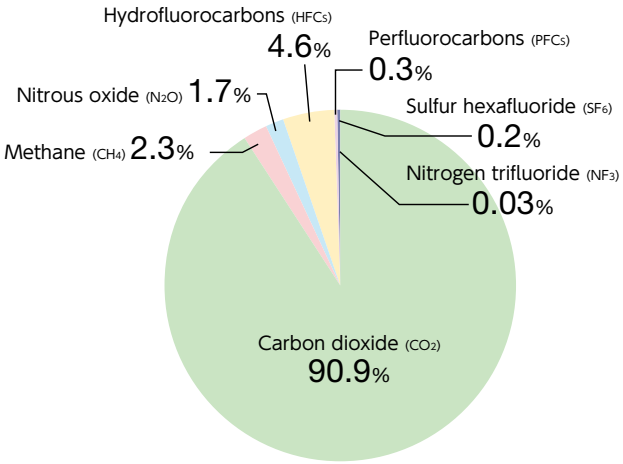
Source: IPCC (2021)

●Contributions to global warming by greenhouse gases emitted due to human activity since the industrial revolution



Source: Created based on the documents of Working Group I of the IPCC Sixth Assessment Report (2021)

●Contributions to global warming by greenhouse gases emitted by Japan(for FY2021)



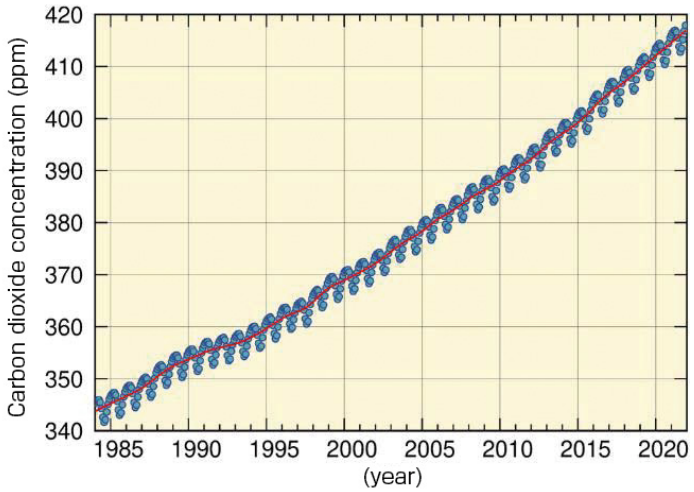
Source: GIO "Greenhouse Gas Inventory"

■Trends in concentration of carbon dioxide in the atmosphere

The concentration of carbon dioxide in the atmosphere varies cyclically every year due to factors such as plant photosynthesis. The amount of change also depends on the location, due to differences in local vegetation, etc.

The concentration of carbon dioxide in the atmosphere remained roughly stable at 280ppm (ppm: parts per million) before the industrial revolution in the latter 18th century, but the rapid increase in manufacturing and production activities following the industrial revolution has been accompanied by an increase in the carbon dioxide concentration. According to the World Data Centre for Greenhouse Gases (WDCGG), the carbon dioxide concentration in 2021 was 415.7ppm, significantly higher than the concentration before the industrial revolution.

●The global mean concentration of carbon dioxide in the atmosphere

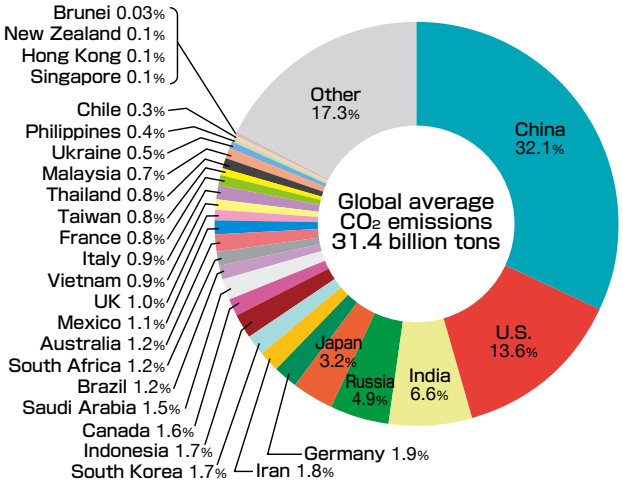


Source: Japan Meteorological Agency (JMA) "Climate Change Monitoring Report 2022" (Tentative translation by Eco-Mo Foundation)

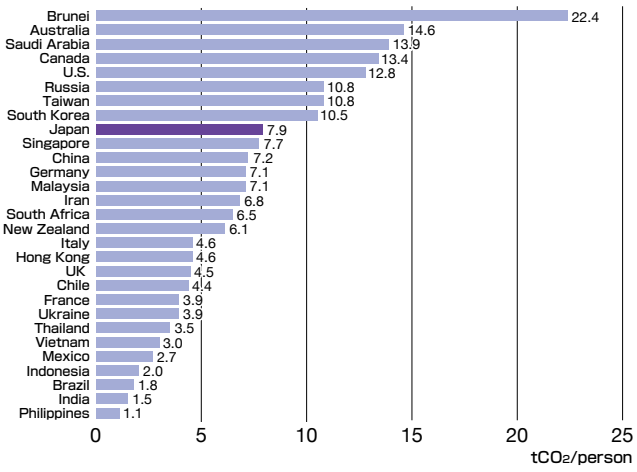
■Carbon dioxide emission volume by country

Carbon dioxide emission volume by country is as follows: China 32.1%, U.S. 13.6%, India 6.6%, Russia 4.9%, followed by Japan at 3.2%. In terms of per capita emissions by country, Japan is number 9.

●Share of carbon dioxide emission volume by country (2020)



●Per capita carbon dioxide emission volume by country (2020)



Source: EDMC "Handbook of Energy & Economic Statistics in Japan 2023"

(2) The United Nations Framework Convention on Climate Change, the Kyoto Protocol, and Paris Agreement

■UNFCCC

UNFCCC was formulated with the objective of stabilizing greenhouse gas concentrations at a level that would prevent dangerous anthropogenic interference with the climate system. It was adopted in May 1992, and after being signed by the heads of states at the June 1992 United Nations Conference on Environment and Development (held in Rio de Janeiro), it went into effect in March 1994.

As of January 2023, the European Union (EU) and 197 countries, including Japan, are signatories.

■The Kyoto Protocol

In December 1997 COP3 was held in Kyoto, and the Kyoto Protocol for achieving the convention's objectives was adopted. The Kyoto Protocol specifies the percentage by which average annual greenhouse gas emissions by developed countries are to be reduced compared to a reference year (in principle 1990) during the period from 2008 to 2012 (the first commitment period). Japan was to have reduced emissions by 6%, the U.S. by 7%, and the EU by 8%. No binding targets were set for developing countries. The November 2004 ratification by Russia satisfied the Kyoto Protocol's requirements for coming into force, and the treaty became effective on February 16, 2005. The U.S. did not ratify the Kyoto Protocol. The first commitment period of the Kyoto Protocol, which went into effect in 2008, ended in 2012. While official adoption will first require screening by the UN, Japan met its greenhouse gas emissions reduction target.

■Paris Agreement

With regard to the framework for 2020 and beyond, an ad hoc working group was established at COP17, which was held in Durban, South Africa in November and December, 2011, and consensus was reached regarding the formulation by 2015 of a new framework which would apply to all countries.

Japan decided on by the Global Warming Prevention Headquarters "Japan's INDC (Greenhouse gas reduction targets, etc. for 2020 and beyond)" in July 2015, and submitted it to the UNFCCC secretariat. Under this INDC, Japan's emissions reduction target was defined as "26.0% reduction in FY2030 compared to FY2013 (25.4% reduction compared to FY2005) (approximately 1,042 million tons of CO_2)".

In November-December 2015, the COP21 took place in Paris, France. The Paris Agreement, a new legal framework to fight against global warming after 2020, was accepted at this conference and effectuated on November 4, 2016.

COP24 was held in Katowice, Poland in December 2018, and consensus was reached regarding the "Paris Agreement" implementation rules, with some exceptions, on which negotiations had continued for three years.

On June 11, 2019, the Cabinet issued a decision titled "Japan's Long-term Strategy under the Paris Agreement" and submitted it to the convention secretariat.

COP25 was held in Madrid, Spain in December 2019 and consensus was reached regarding the promotion of ambitious climate change countermeasures to signatory countries.

COP28 was held in Dubai, United Arab Emirates, from November to December 2023, and the "Global Stocktake," which evaluates the implementation of the Paris Agreement every five years, was conducted for the first time.

The results of the November and December 2023 COP28 are shown below.

Outcomes of COP28, CMP18 and CMA5

December 27, 2023
Delegation of Japan

1. Outline

The 28th session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP28), the 18th session of the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol (CMP18), and the 5th session of the Conference of the Parties serving as the Meeting of the Parties to the Paris Agreement (CMA5), as well as the 59th session of the Subsidiary Body for Implementation and the Subsidiary Body for Scientific and Technological Advice, were held in Dubai, UAE from November 30th to December 13th.

Prime Minister KISHIDA Fumio participated in the World Climate Action Summit on December 1st and 2nd, and he stressed the critical importance of action by 2030 and the need to achieve net zero by 2050 globally, set economy-wide absolute reduction target covering all greenhouse gases, and peak global greenhouse gas emissions by 2025.

Minister of the Environment ITO Shintaro participated in ministerial meetings which were held in the second week of the conferences, and State Minister of Health, Labour and Welfare HAMACHI Masakazu and Parliamentary Vice-Minister of Economy, Trade and Industry YOSHIDA Nobuhiro participated in related meetings.

In addition, officials from the Ministry of Foreign Affairs, the Ministry of the Environment, the Ministry of Economy, Trade and Industry, the Ministry of Finance, the Ministry of Education, Culture, Sports, Science and Technology, the Ministry of Health, Labour and Welfare, the Ministry of Agriculture, Forestry and Fisheries, the Ministry of Land, Infrastructure, Transport and Tourism, the Financial Services Agency, the Forestry Agency, and the Japan Meteorological Agency participated in the conferences.

At COP28, decision on the Global Stocktake, which assesses the world's collective progress toward achieving the objectives of the Paris Agreement; decision on the operationalization of the new funding arrangements, including a fund, for responding to loss and damage, which elaborates on their basic institutional design; as well as decisions on mitigation, adaptation, finance, and just transition, respectively, for each agenda item were adopted.

2. Summary of the Negotiations

(1) Global Stocktake (GST)

After two weeks of discussions and negotiations, including the high-level event on December 1-2, the decision on the first Global Stocktake was adopted.

The decision emphasizes the need for urgent action to achieve the 1.5°C goal, peaking global greenhouse gas emissions at the latest before 2025, setting economy-wide emission reduction targets covering all greenhouse gases, and sectoral contributions taking into account different national circumstances, pathways and approaches (e.g., tripling renewable energy capacity globally and doubling the global average annual rate of energy efficiency improvements, efforts related to fossil fuels, zero- and low-emission technologies (nuclear, CCUS, low-carbon hydrogen, etc.) and the road sector, etc.). The importance of Article 6 of the Paris Agreement (market mechanisms), engagement of cities, and the transition to sustainable lifestyles were also incorporated in the decision.

(2) New funding arrangements, including a fund, for responding to loss and damage

On November 30 at the opening plenary of the COP28, Parties adopted the decision to operationalize the new funding arrangements, including a fund, for responding to loss and damage associated with the adverse effects of climate change, which were established at COP 27 last year. The decision, including the Governing Instrument of the Fund, elaborates on the basic institutional design of the Fund and the funding arrangements. It is highly unusual that a substantive decision, instead of a procedural matter, was adopted on the opening day of COPs.

Following the adoption of the decision, Parties, including Japan, made pledges to contribute to the Fund, mainly for commencing its operationalization (Note 1).

The Fund (the name is to be decided by the Fund's Board) will aim to assist developing countries that are particularly vulnerable to the adverse effects of climate change, will be hosted by the World Bank, and will be able to receive contributions from a wide variety of sources, including public, private, and innovative sources, while developed countries are invited to take the lead to provide financial resources for commencing the operationalization of the Fund.

Regarding the funding arrangements, it was decided that regular dialogues would be held between the Fund and the institutions comprising the funding arrangements (e.g.: the World Bank, the IMF, the Warsaw International Mechanism, the Santiago Network, etc.), so that both the Fund and those various funding arrangements would

coordinate and complement each other to respond to loss and damage.
（Note 1） Japan pledges US$10 million for the resources for commencing the operationalization of the Fund.

(3) Loss and Damage
The United Nations Office for Disaster Risk Reduction (UNDRR) and the United Nations Office for Project Services (UNOPS) were selected as the host of the Santiago Network (SN) secretariat to catalyse technical assistance on loss and damage. Consensus was reached on the roles of the UNFCCC Secretariat, the host of the SN secretariat and the Advisory Board. The members of the Advisory Board were selected and the full operationalization of the SN from the next year was decided. The decision expressed appreciation for the contributions to the SN by Japan and other countries.

(4) Mitigation
2023 was the first year for the implementation of "Sharm el-Sheikh mitigation ambition and implementation work programme" decided at COP27, and two global dialogues were held to discuss accelerating just energy transition, including that in transport systems. The decision adopted at COP28 notes these dialogues (including actionable solutions on renewable energy, energy efficiency, CCUS and others.) and discussions at the high-level ministerial round table on pre-2030 ambition. It was also decided to request the Subsidiary Bodies to consider progress at each of their sessions.

(5) Adaptation
As the outcome of two years of discussions under the Glasgow-Sharm el-Sheikh Work Programme on the Global Goal on Adaptation (GGA), as stipulated in Article 7 of the Paris Agreement, decision on a framework for achieving the GGA was adopted. The Framework, which is country-driven and voluntary, sets seven thematic targets and four targets for the adaptation cycle. It was also decided to set a new agenda for the GGA, launch a two-year work programme to consider indicators for measuring progress achieved towards the targets, and initiate discussions on the realization of the GGA and accelerated implementation of the Framework.

(6) Climate Finance
Issues such as long-term climate finance, post-2025 New Collective Quantified Goal (NCQG), Standing Committee on Finance (SCF) and the Financial Mechanisms were discussed.
Regarding the NCQG, it was decided to continue the Technical Expert Dialogue (TED) under the Ad Hoc Work Programme, which has been ongoing since 2022, with a view to the adoption of a decision at COP29/CMA6, and in addition, to establish a forum for all Parties and observers to participate in the discussions.
Regarding Article 2.1 (c) of the Paris Agreement (Note 2), developed countries proposed the establishment of a new platform to deepen mutual understanding between developed and developing countries, but both sides did not reach consensus, and it was decided to continue and strengthen the existing Sharm el-Sheikh Dialogue.
（Note2：Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.）

(7) Just Transition
It was decided that "the work programme on just transition pathways (JTWP)", established at COP27, includes elements such as energy, socioeconomics, workforce, and that the JTWP will continue until 2026, at which point Parties review the effectiveness and efficiency of the JTWP and consider its continuation.

(8) Article 6 of the Paris Agreement and Clean Development Mechanism (CDM) under the Kyoto Protocol
Regarding Article 6, Paragraphs 2 and 4 of the Paris Agreement, Parties were unable to reach a consensus on the details of reporting to the UN, etc., and the issue will continue to be discussed.
Regarding Article 6, Paragraph 8 (non-market approaches), Parties decided on the operation of the UNFCCC web-based platform for submitting and recording information on non-market approaches from interested Parties and on the schedule for the work programme. It was also decided that the Secretariat would prepare a technical paper on time frames for the termination of the CDM and the necessary budget and continue to study this issue.

(9) Other agenda items
The discussions on the broad agenda items including technology development and transfer, capacity-building, agriculture, research and systematic observation, response measures, gender and climate change and Action for Climate Empowerment were taken place.
The election of members of the Constituted Bodies under the UNFCCC and the Paris Agreement was also conducted and one Japanese member was elected. It was also decided that the Republic of Azerbaijan will host the COP29, and Brazil will host the COP30.

3. Ministerial Meetings

Minister ITO held 21 bilateral meetings with Australia, Brazil, Canada, China, the European Commission, France, Georgia, Germany, India, Italy, Kazakhstan, Norway, Papua New Guinea, Republic of Korea, Republic of Moldova, Singapore, Tunisia, UK, Ukraine, US and the UAE. In each meeting, the Minister exchanged views on the proposal for the consensus on negotiation agendas such as the Global Stocktake, and the effective implementation of climate actions.

4. Japan Pavilion

Japan set up the Japan Pavilion at the COP28 venue where Japanese companies and institutions introduced their measures on mitigation, adaptation, effective CO2 utilization and others through exhibitions, panel displays, online exhibitions, and various seminars.

On December 2, Prime Minister KISHIDA and representatives of both Japanese and UAE companies participated in the "Action to Zero led by Japan and the UAE," where the strong Japan-UAE relationship was confirmed, and where Prime Minister KISHIDA presented the policy to take on the two remaining major challenges: 1) the industry decarbonisation and 2) the decarbonisation in Asia's growing economies.

Furthermore, Prime Minister KISHIDA stated that Japan will make full use of Japan's financial and technological capabilities, and work with other countries in Asia and the Middle East to achieve decarbonisation and economic growth together while emphasizing "Problem-solving capability as an engine of growth" and "Decarbonisation is also a growth opportunity for Japan".

5. Participation in international initiatives

The Government of Japan participated in the following international initiatives on climate change at COP28:

- Dec.1: "Emirates Declaration on Sustainable Agriculture, Resilient Food Systems, and Climate Action" led by the UAE
- Dec.1: "Green Shipping Challenge" led by the US and Norway
- Dec.1: "Action on Water Adaptation and Resilience (AWARe)" led by WMO and former Chair Egypt
- Dec.2: "Global Renewables and Energy Efficiency Pledge" led by the UAE and the EU
- Dec.2: Declaration to "Triple Nuclear", including a cooperation policy toward the ambitious goal of "tripling global nuclear power capacity from 2020 by 2050, recognizing different domestic circumstances of each participant" led by the UAE and the US, among others.
- Dec.2: "Climate Club" led by Germany, to decarbonize industry
- Dec.3: "Declaration on Climate, Relief, Recovery and Peace" led by the UAE
- Dec.3: "Declaration on Climate and Health" led by the World Health Organization (WHO) and the UAE
- Dec.4: "Gender-Responsive Just Transitions and Climate Action Partnership" led by the UAE
- Dec.5: "Declaration of Intent on Mutual Recognition of Certification schemes for renewable and low-carbon hydrogen and hydrogen derivatives" led by the UAE, to promote international trade in hydrogen and other products.
- Dec.5: "Statement of Intent on The Green Public Procurement" led by the United Nations Industrial Development Organization (UNIDO), aiming to create demand for green materials in hard-to-abate sectors.
- Dec.5: "Carbon Management Challenge" led by the US to accelerate the development and deployment of technologies for carbon dioxide capture, utilization, and storage (CCUS) and carbon dioxide removal (CDR).
- Dec.5: "Global Cooling Pledge" led by UNEP and the UAE, to achieve sustainable cooling
- Dec.6: "Buildings Breakthrough" led by France, Morocco and UNEP
- Dec.7: "The 'Sapporo Five' Statement" by Canada, Japan, France, the UK and the US to achieve a resilient supply chain for nuclear fuel.
- Dec.10: "Global River Cities Alliance" led by India.

6. Initiatives led by Japan

On December 9, amid the need to achieve rapid and substantial reductions to achieve the 1.5°C target, Japan announced the "Assistance Package to Promote Investments for Global Actions Toward the Achievement of the Paris Agreement Goals". The Package aims to close the three gaps of "ambition gap," "adaptation gap," and "implementation gap" and bring the emission pathway on-track by establishing a foundation to promote investment in decarbonization and adaptation. A seminar inviting involved countries was held at the Japan Pavilion to present relevant policies, such that Japan's policies were widely disseminated both domestically and internationally.

Source: Ministry of Foreign Affairs of Japan website

(3) Current status of global warming issues in Japan

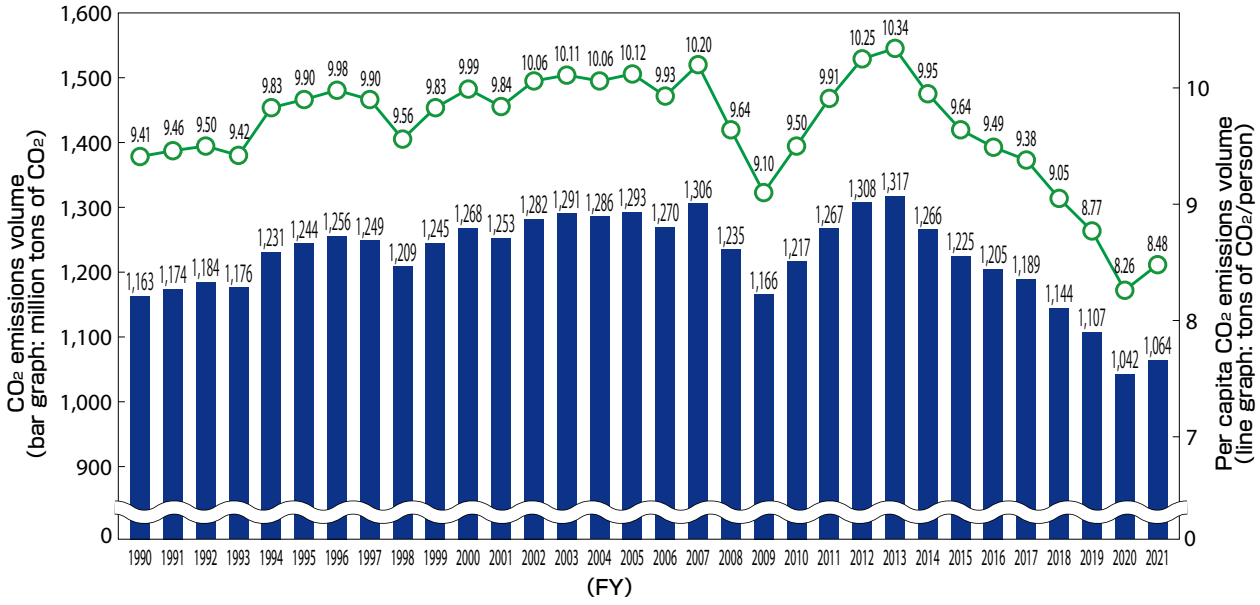
①Current status of carbon dioxide emissions in Japan

Japan is the world's 5th largest producer of carbon dioxide emissions, so it plays an extremely important role in solving the problem of global warming.

■Trends in carbon dioxide emissions in Japan

In FY2021 Japan emitted approximately 1,064 million tons of carbon dioxide, roughly 19.2% less than it did in FY2013. The per capita emissions volume in FY2021 was approximately 8.48 tons.

●Trends in carbon dioxide emissions in Japan

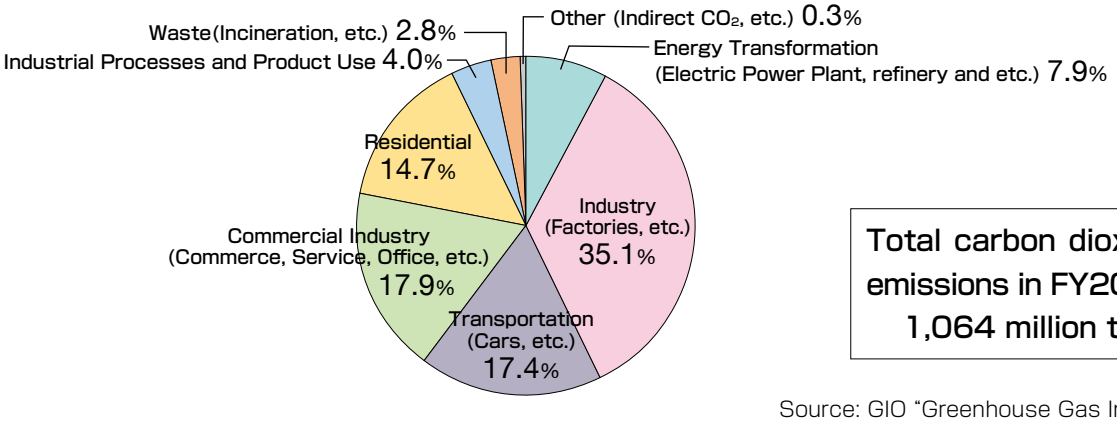


Source: GIO "Greenhouse Gas Inventory"

■Ratio of carbon dioxide emissions in Japan by sector

The industrial sector accounts for 35.1% of Japan's carbon dioxide emissions, the transport sector for 17.4%, business and other sectors account for 17.9%, and the home sector accounts for 14.7%.

●Amount of carbon dioxide emissions in Japan (by sector) FY2021



Total carbon dioxide emissions in FY2021
1,064 million tons

Source: GIO "Greenhouse Gas Inventory"

②Energy consumption in Japan

The rapid increase in fossil fuel consumption since the industrial revolution is considered to be one of the main causes of global warming. Global warming is inextricably linked to energy consumption.

■Final energy consumption in Japan

Japan's energy consumption grew faster than its GDP during the period of rapid economic growth which lasted into the 1970s. However, the two times oil crises in the 1970s led to increased efforts to reduce energy consumption by the manufacturing sector, and the development of energy saving products. These efforts made it possible to restrain energy consumption while still achieving economic growth. Throughout the 1990s crude oil prices remained at a low level but energy consumption of the home sector and the business sector increase. The price of crude oil began rising again in the 2000s, and energy consumption has been falling since peaking in FY2005. In FY2021, real GDP increased by 2.6% compared to FY2020 due to the economic recovery from the COVID-19 pandemic, whereas the final energy consumption increased by 1.6% over the same period.

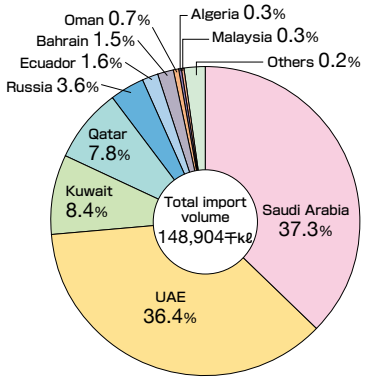
Looking at energy consumption trends from FY1973 to 2021, energy consumption for the company and business site sector grew 0.9-fold (0.8-fold for the industrial sector and 2.0-fold for the business and other sectors), 1.8-fold for the home sector, and 1.5-fold for the transport sector. Since the first oil crisis, the company and business site sector, although experiencing economic growth, have seen the same level in energy consumption thanks to the implementation of energy saving measures mainly in the manufacturing industry. On the other hand, the home sector and the transport sector have seen a great increase in energy consumption because of the spread of energy equipment and automobiles. As a result, while the company and business site sector, the home sector, and the transport sector accounted, respectively, for 74.7%, 8.9%, and 16.4% of total energy consumption in FY1973, in FY2021 these ratios had changed to 63.5%, 14.6%, and 21.9% respectively.

■Dependence on petroleum for energy consumed in Japan

The amount of oil supply in Japan as a primary energy source decreased due to the promotion of oil substitution policy and energy conservation policy triggered by the oil crisis, but turned to increase in the late 1980s after the application round of easier energy conservation measures and with a decline in oil prices. Since the mid-1990s, the supply has been on a downward trend again due to progress in the use of energy alternative to petroleum and improved fuel efficiency of automobiles. The supply in FY2021 is 6,735 PJ on a calorific value basis.

The crude oil self-sufficiency rate in Japan has remained below 0.5% since around 1970 until FY2021. The supply structure that relies on foreign countries for the majority of its energy resources is clearly stated as a structural issue in Japan's energy supply and demand in the Sixth Basic Energy Plan approved by the Cabinet in October 2021. Japan imports the crude oil from the Middle East region including Saudi Arabia, the United Arab Emirates, Qatar, Kuwait, Iraq, and Oman, and their combined share in total was 92.5% in FY2021.

●Crude oil imports by supplying country (FY2021)



Source: created based on METI "Yearbook of Mineral Resources and Petroleum Products Statistics" (Tentative translation by Eco-Mo Foundation)

(Source: METI "Energy White Paper 2023" (Tentative translation by Eco-Mo Foundation))

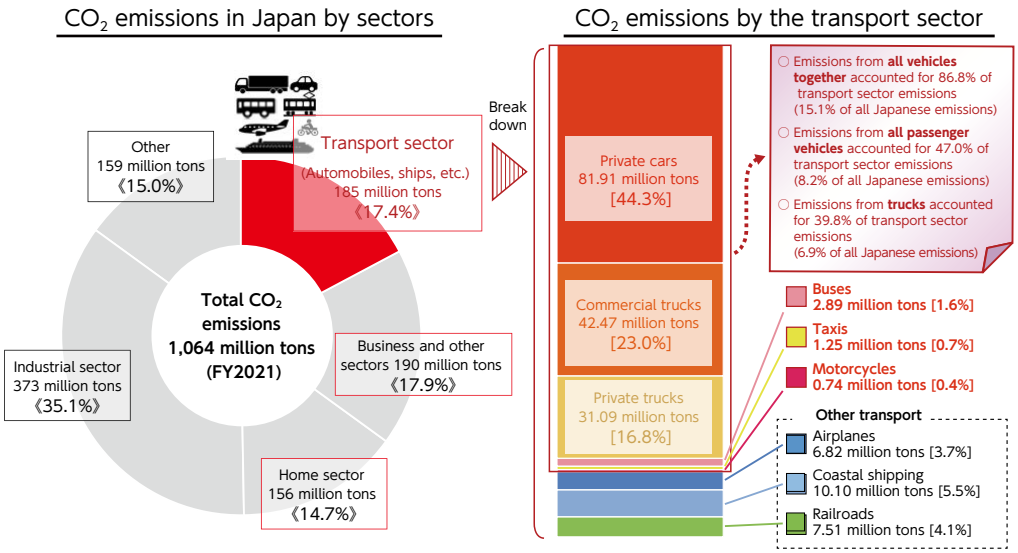
(4) Current status of global warming issues in the transport sector

①Current status of carbon dioxide emissions by the transport sector

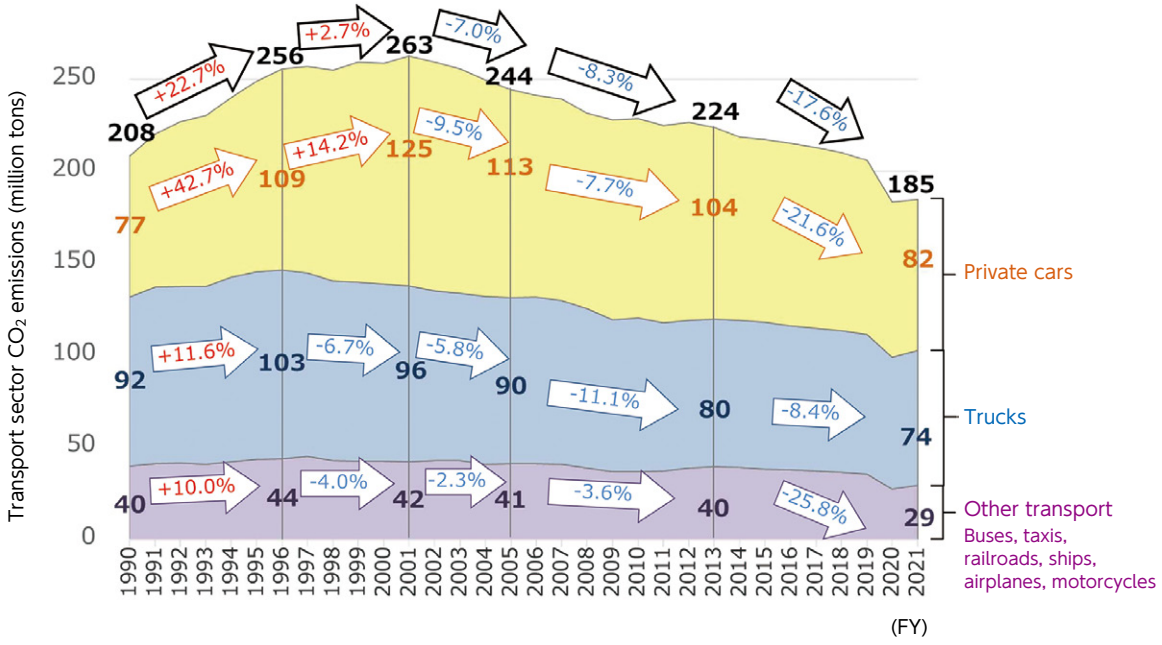
■Trends in carbon dioxide emissions by the transport sector

Japan's total carbon dioxide emissions in FY2021 (1,064 million tons), emissions from the transport sector accounted for 17.4% (185 million tons). Emissions from all vehicles together accounted for 86.8% of the transport sector emissions (15.1% of Japan's total emissions), emissions from all passenger vehicles accounted for 47.0% of the transport sector emissions (8.2% of Japan's total emissions), and emissions from trucks accounted for 39.8% of the transport sector emissions (6.9% of Japan's total emissions).

●Trends in carbon dioxide emissions by the transport sector



※ Due to rounding, total values may not match.
※ Emissions from power generation by power providers and emissions from heat generation by heat providers are allocated to their respective final demand sectors in proportion to energy consumption amounts.
※ Created by the MLIT Policy Bureau Environmental Policy Division based on the Greenhouse Gas Inventory Office of Japan's "Greenhouse Gas Emissions Data of Japan (FY1990 to 2021)"
※ Motorcycles were included in "Business and other sectors" until FY2015 data, but were calculated as an independent item in the transport sector from FY2016 data.



Source: MLIT website (Tentative translation by Eco-Mo Foundation)

From FY1990 to 1996 the amount of carbon dioxide emitted by the transport sector rose by 22.7%, but from FY1997 to 2001 emissions remained roughly level, and began falling from FY2001 onwards.

Emissions in FY2021 decreased compared to FY2013, mainly due to improved fuel efficiency of automobiles and a decrease in transport volume due to the impact of the COVID-19 pandemic. Furthermore, compared to the previous fiscal year, emissions increased due to factors such as the increased transport volume resulting from economic recovery from the downturn caused by the COVID-19 pandemic.

■Carbon dioxide emission volume per unit of transport volume

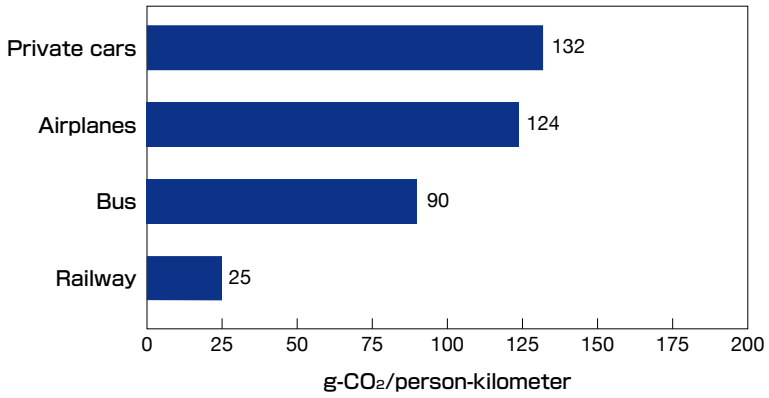
Generally speaking, when the transport volume increases, so does the amount of carbon dioxide emissions. Transport volume is affected by economic trends and other factors, so for total carbon dioxide emissions in the transport sector to fall regardless of changes in transport volume, it is important to promote highly effective transport.

In this section, we compare the amount of emissions per unit of transport volume, an indicator of efficiency, for passenger transport and freight transport.

Note that these figures consider only the classification of transport modes and do not differentiate by size, vehicle type, vessel type, or model.

For passenger transport, the carbon dioxide emissions from each mode of transport are divided by the transport volume (person-kilometers) to calculate the carbon dioxide emissions per unit of transport volume. The results are shown in the figure below.

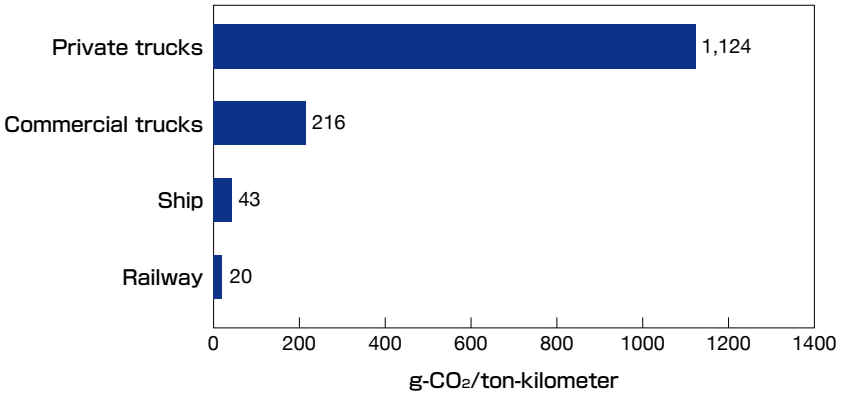
●Carbon dioxide emission rates by passenger transport mode (FY2021)



*Due to the decrease in the number of passengers in each transport system caused by the spread of the coronavirus pandemic, carbon dioxide emissions per unit of production were calculated to be extremely high compared to previous years. Please exercise caution when using this data.

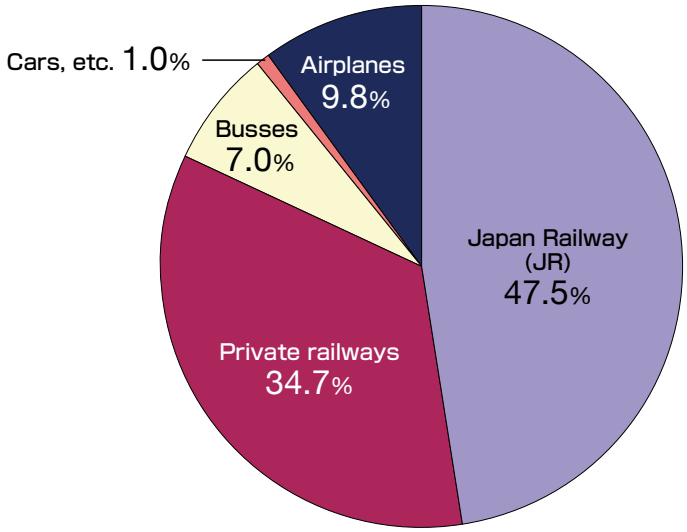
For freight transport, the carbon dioxide emissions from each mode of transport are divided by the transport volume (ton-kilometers) to calculate the carbon dioxide emissions per unit of transport volume. The results are shown in the figure below.

●Carbon dioxide emission rates by freight transport mode (FY2021)



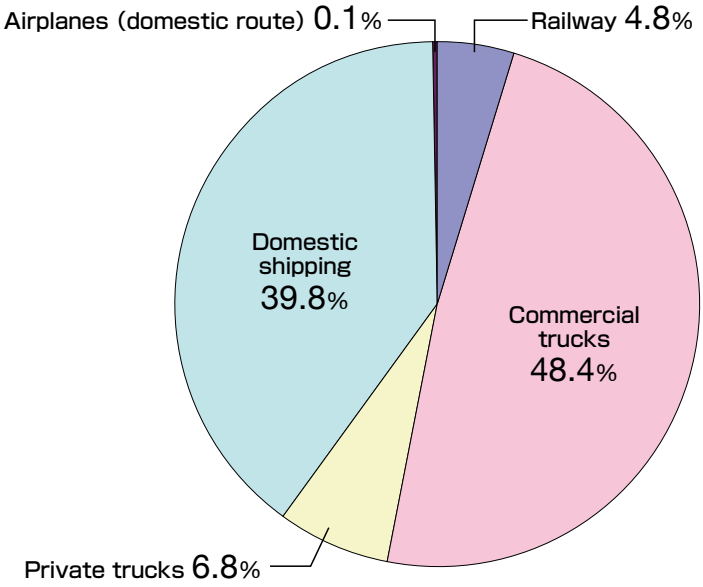
Source: MLIT website (Tentative translation by Eco-Mo Foundation)

●Modal shares of domestic passenger transport (100 million person-km) FY2020



*1 The air transport volume percentage is the total of both regular and irregular services.
*2 The cars, etc., percentage includes both light-vehicle and truck transport.
*3 The buses and cars, etc., percentage does not include private vehicle transport.
*4 Passenger ship figures have not been released.

●Modal shares of domestic freight transport (100 million ton-km) FY2020



*1 The air transport percentage is the total of both regular and irregular services, and includes excess luggage and postal mail.
*2 The total of subtotals for individual transport modes and the total for transport modes may not be identical due to rounding.

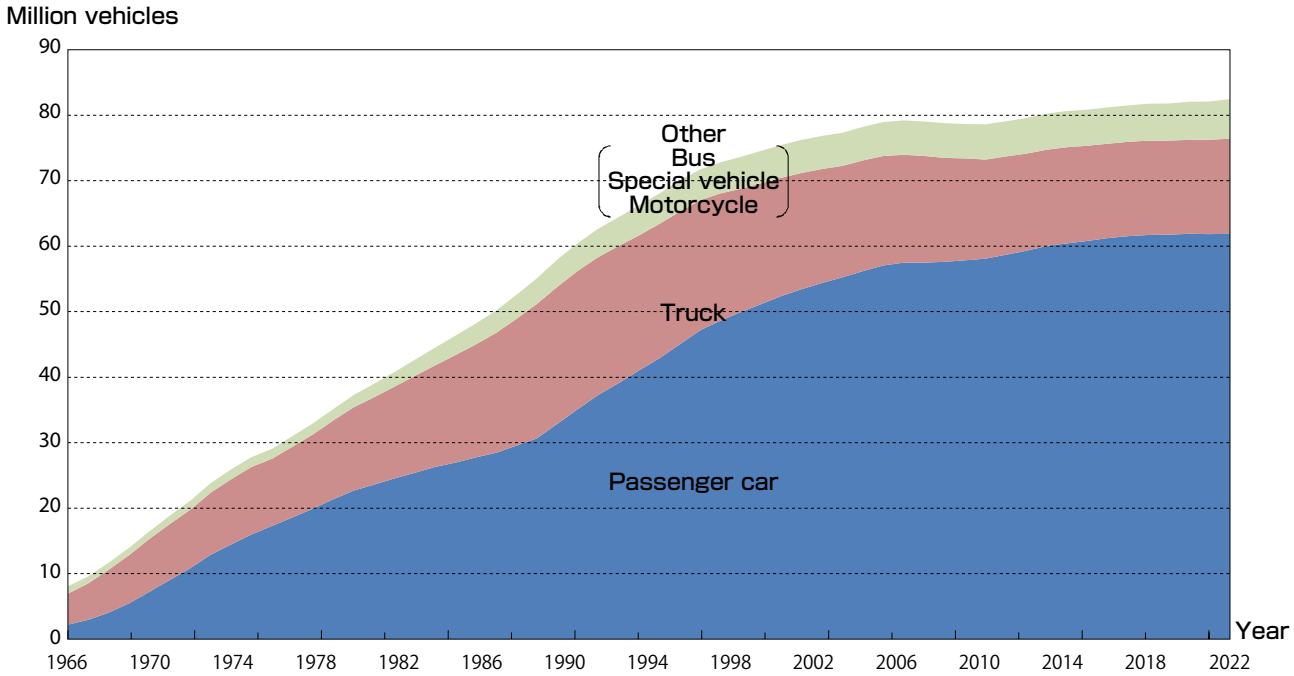
Source: MLIT (Tentative translation by Eco-Mo Foundation)

②Energy consumption by the transport sector

Over the past few years automobile fuel efficiency improvements and increased shift from in-house or private operation to commercial truck operation have brought about a reduction in carbon dioxide emissions by the transport sector. Emissions in FY2021 were 185 million tons.

Efforts must continue to be made to achieve further reductions in the amount of energy consumed by automobiles.

●Automobile ownership trends



1: Passenger vehicles includes light vehicles.
2: Number of vehicles as of the end of March of each year.

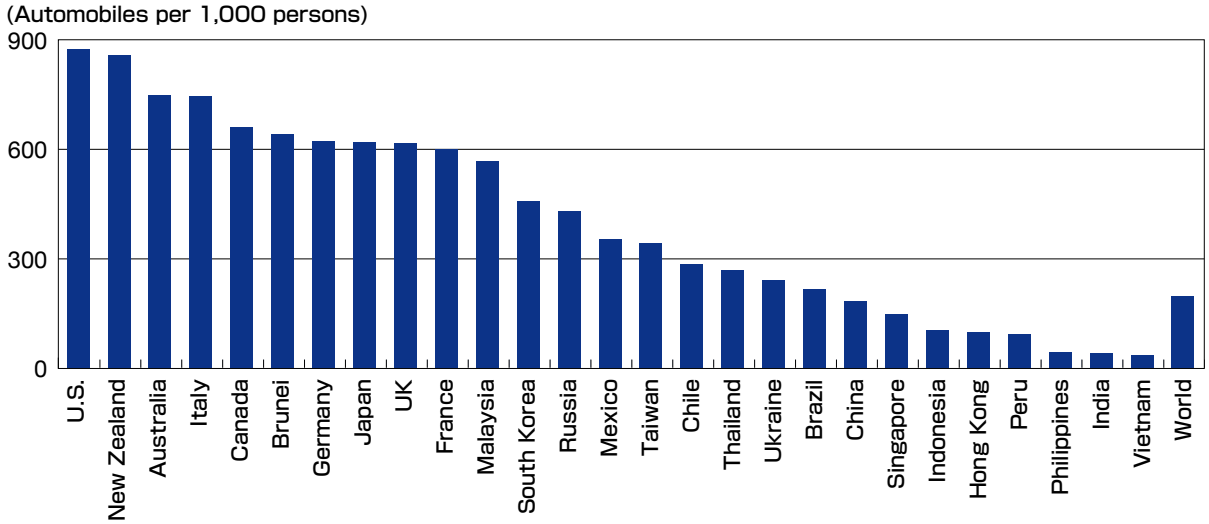
Source: Automobile Inspection & Registration Information Association website (Tentative translation by Eco-Mo Foundation)

Column

Automobile ownership rates around the World

In terms of automobile ownership per thousand people, U.S. has the world's highest automobile ownership rate, at 874 automobiles per thousand people. Automobile ownership rates are low for developing countries. In recent years developing countries such as China and India have experienced dramatic upswells in automobile ownership led by their rapid economic growth. The number of cars owned per thousand people grew by 3.1% globally in 2019, but in China it grew by 9.7%. Automobile ownership in countries with enormous populations is predicted to have some impact on global warming, and is an area where attention is being increasingly focused.

●Automobile ownership rates in individual countries 2019



Source: EDMC "Handbook of Energy & Economic Statistics in Japan 2023"

2 Current status of automobile gas emissions

Road traffic related environmental problems involving the transport sector include atmospheric pollution produced by suspended particulate matter (SPM) and nitrogen oxides (NOx) such as nitrogen dioxide (NO_2) emitted from automobiles. NOx is not only a cause of acid rain and photochemical smog, but also has negative health effects (on respiratory organs). SPM is also said to harm respiratory organs by adhering to the lungs and bronchi.

In recent years all air pollution monitoring stations*1 have met FY2021 air quality standards achievement rates for NO_2, with 100% achievement rates for sixteen consecutive years since FY2006. In the automobile exhaust gas monitoring stations*2, 100% of all effective monitoring stations achieved the environmental standard.

For SPMs, nationwide FY2021 air quality standards achievement rate was 100% for air pollution monitoring stations and 100% for automobile exhaust gas monitoring stations. These have stayed roughly level for both types of stations in comparison to 2020 (air pollution monitoring stations: 99.9%, automobile exhaust gas monitoring stations: 100%).

＊1 Air pollution monitoring station:
Monitoring stations performing regular monitoring of general atmospheric pollution conditions. (Nationwide: 1,413 stations)

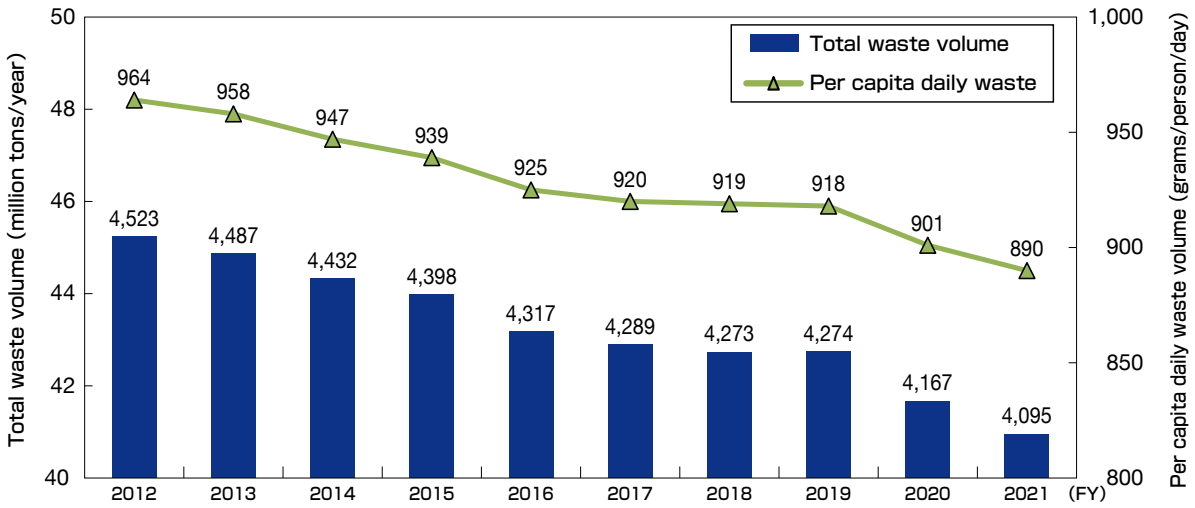
＊2 Automobile exhaust gas monitoring station:
Monitoring stations performing regular monitoring of atmospheric pollution conditions near intersections, roads, and road edges in which emissions from automobiles are believed to be sources of air pollution. (Nationwide: 383 stations)

3 Current status of waste and recycling

①Trends in general waste volume

Total waste volume and per capita daily waste volume fell slightly after the second oil crisis in FY1979, but began rising rapidly from roughly FY1985. From FY1990 they leveled off or increased slightly, but began falling from FY2001. In FY2021 the total amount of waste was 40.95 million tons. The total amount of recycled waste in FY2021 was 8.16 million tons. The ratio of total waste which was recycled has grown tremendously, from 5.3% in FY1990 to 19.9% in FY2020.

●Total waste volume and per capita daily waste volume

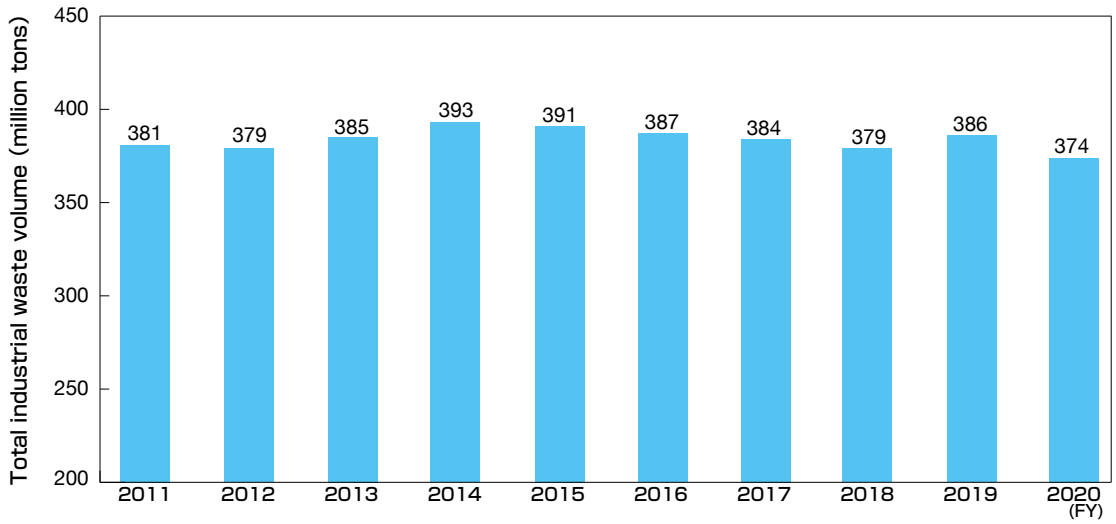


Source: MOE website (Tentative translation by Eco-Mo Foundation)

②Trends in industrial waste volume

The amount of industrial waste produced has stayed roughly at the same level since the FY1990s at approximately 400 million tons.

●Industrial waste volume



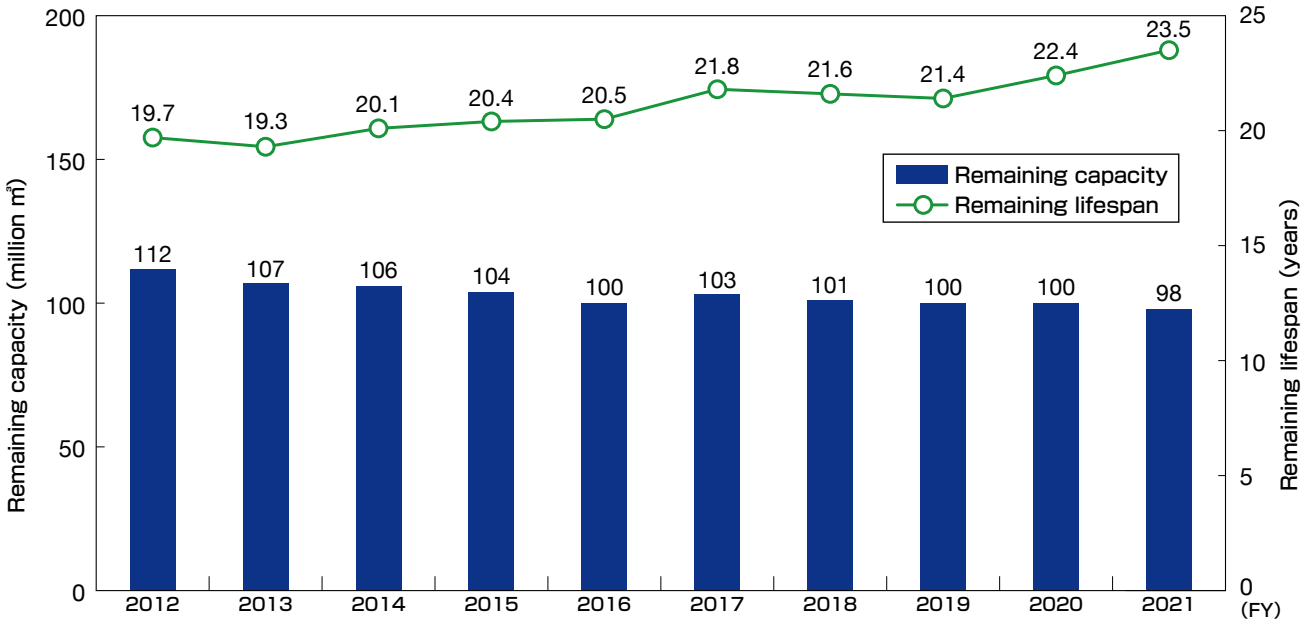
Source: MOE website (Tentative translation by Eco-Mo Foundation)

③Remaining lifespans and remaining capacities of general and industrial waste final disposal sites

As of the end of FY2021, there were 1,572 final disposal facilities for general waste, with a remaining capacity of 98.45 million m^3 and a remaining lifespan of 23.5 years on national average. The remaining capacity remains at roughly the same level as the remaining lifespan.

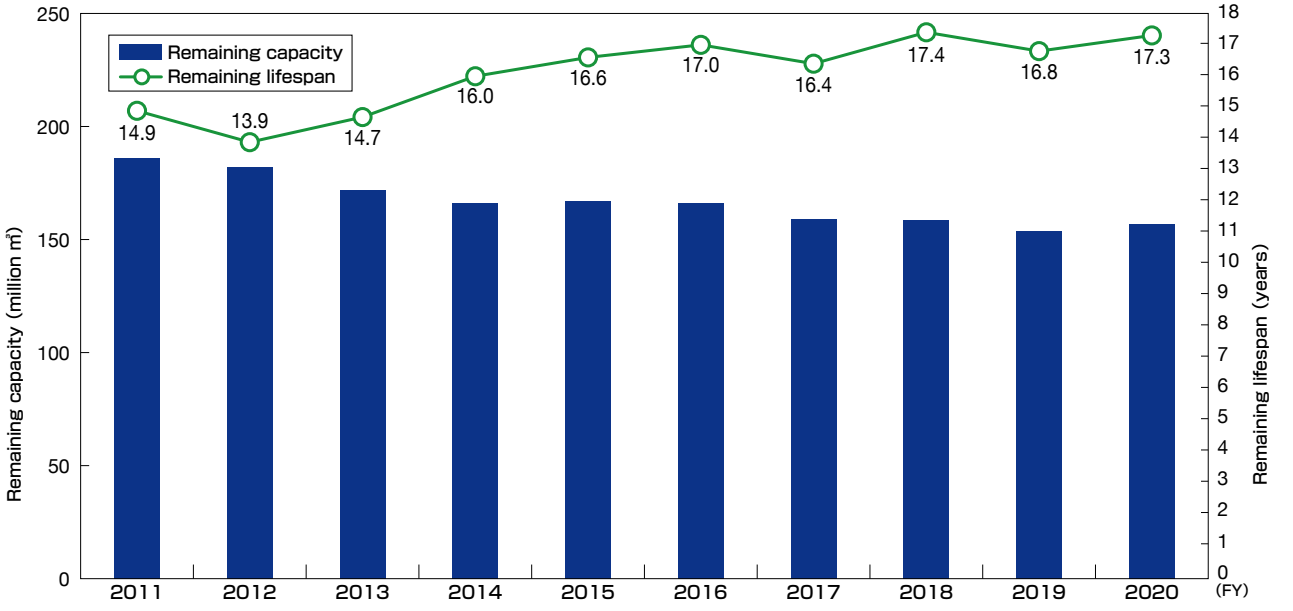
The remaining capacity of industrial waste final disposal sites as of the end of FY2020 was 157.07 million m^3 –approximately 3.1 million m^3 more than the previous year. In addition, the remaining life was 17.3 years on national average, and improvements are being made gradually.

●Remaining lifespans and remaining capacities of final disposal sites (general waste)



Source: MOE website (Tentative translation by Eco-Mo Foundation)

●Remaining lifespans and remaining capacities of final disposal sites (industrial waste)

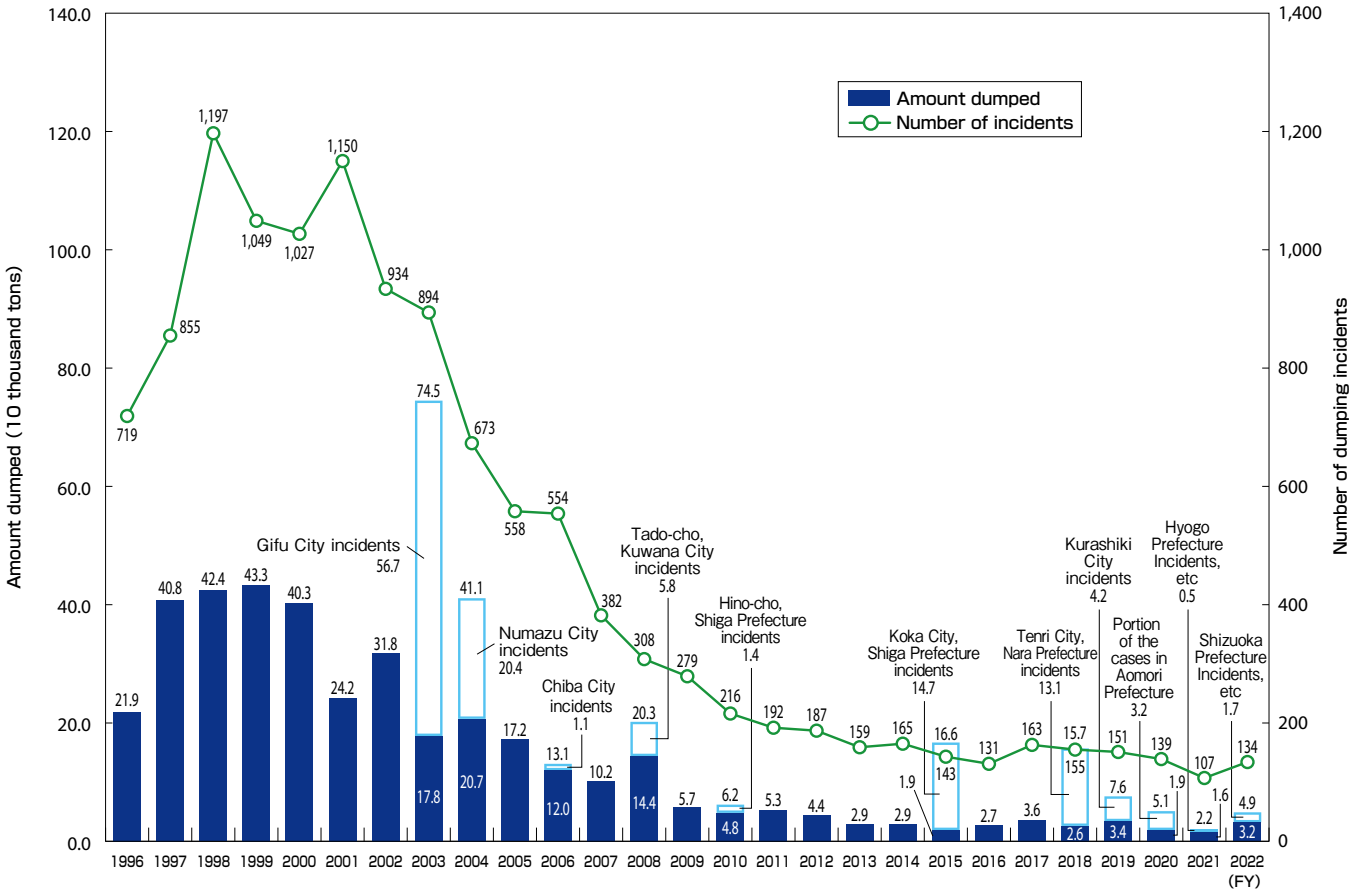


Source: MOE website (Tentative translation by Eco-Mo Foundation)

④Trends in number of incidents of illegal dumping, etc., and amount dumped

134 incidents of illegal dumping of industrial waste, a total of 49,000 tons of waste, were discovered in FY2022, along with 107 incidents of improper disposal (26,000 tons). Newly discovered cases of illegal dumping decreased considerably and steady results are being observed. Although the number of cases of improper disposal has decreased, it has not yet been eliminated as new cases were still being discovered in FY2022.

●Number of incidents of illegal dumping of industrial waste and amount dumped



Note)
1. The number of incidents of illegal dumping and the amount of illegally dumped waste were calculated based on incidents of illegal dumping of 10t or more of industrial waste per incident identified by the governments of prefectures and designated cities (as well as all incidents of illegal dumping of special controlled industrial waste).
2. The white areas of the bar graph correspond to the following incidents.
   · FY2003, Gifu City – Large scale incidents were reported in FY2003
   · FY2004, Numazu City–Large scale incidents were reported in FY2004
   · FY2006, Chiba City–Incidents were discovered in FY1998, but reported in FY2006
   · FY2008, Tado-machi, Kuwana City–Incidents were discovered in FY2006,but reported in FY2008
   · FY2010, Hino-machi, Shiga Prefecture–Incidents were discovered in FY2009,but reported in FY2010
   · FY2015, Koka City, Shiga Prefecture, Ube City, Yamaguchi Prefecture and Kuji City, Iwate Prefecture –Incidents were reported in FY2015
   · FY2018, Tenri City –Incidents were reported. Also, Incidents discovered in FY2016 by Yokosuka City and incidents discovered in FY2017 by Shibayama-machi, Chiba Prefecture are included.
   · FY2019, Kurashiki City –Incidents discovered in FY2014 by Yamaguchi City, Yamaguchi Prefecture and incidents discovered in FY2016 by Kurashiki City are included
   · FY2020, Cases in Goshogawara City, Aomori Prefecture; Kanuma City, Tochigi Prefecture; Yawata City, Kyoto Prefecture; and Mito City reported as large-scale cases
   · FY2021, Kakogawa City, Hyogo prefecture – Large scale incidents were reported in FY2021
   · FY2022, Cases in Kakegawa City, Shizuoka Prefecture; Kasai City, Hyogo Prefecture; Kamigori Town, Hyogo Prefecture reported as large-scale cases
3. Sulfuric acid pitch was excluded from this study.
4. Ferosilt dumping incidents were not included in this study. 720,000 tons of Ferosilt were sold and used as backfilling material since August 2001, but it was later discovered that the manufacturer and seller of Ferosilt had mixed in toxic waste liquid,making this an illegal industrial waste dumping incident. Illegal dumping was confirmed in 45 locations in 4 prefectures, and Ferosilt removal has been completed in all of these locations.

* Amounts are rounded, so totals may not match.

Source: MOE website (Tentative translation by Eco-Mo Foundation)

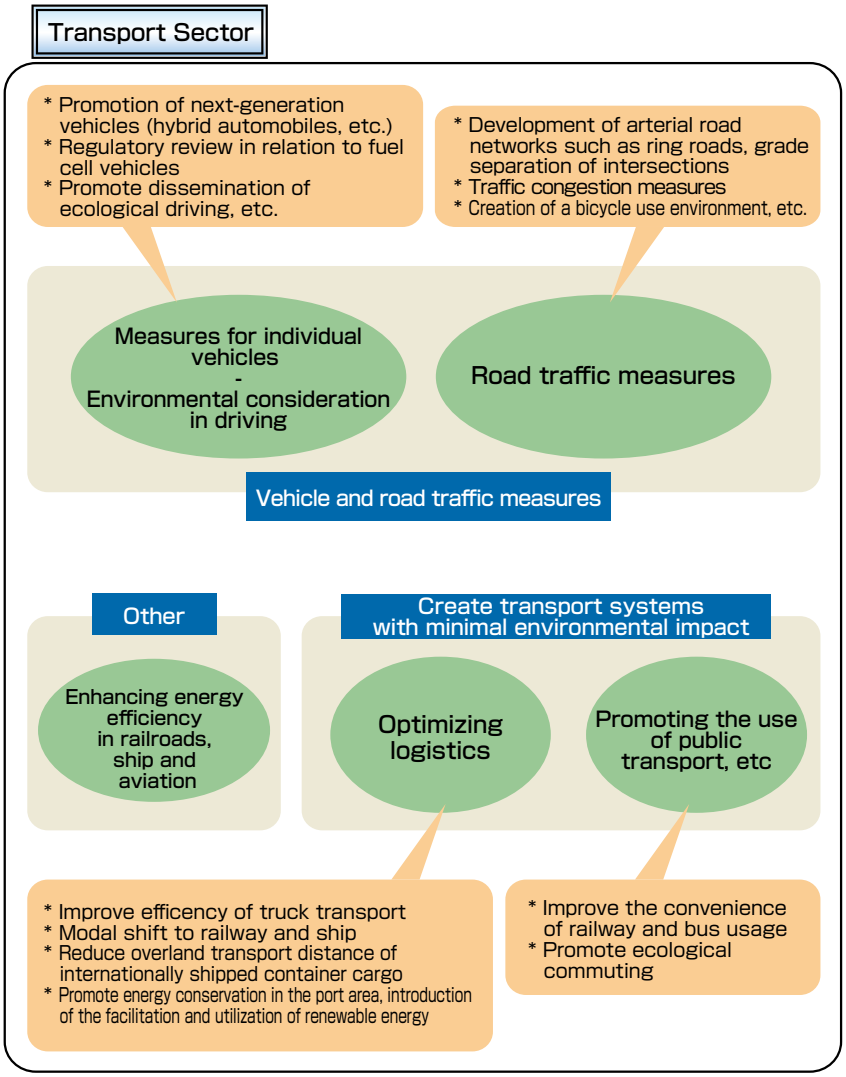
Ⅲ. Measures in Response to Major Environmental Problems of the Transport Sector

1 Promotion of global warming countermeasures

(1) Transport sector countermeasures

The amount of carbon dioxide emitted by the transport sector in FY2021 was 17.3% lower than the amount emitted in FY2013, and emissions volume has been decreasing since 2001. In order to ensure that this decrease continues steadily, the MLIT is promoting comprehensive measures such as automobile and road traffic measures, logistics efficiency improvements, and promoting the use of public transport.

●Global warming countermeasures of MLIT



Source: MLIT (Tentative translation by Eco-Mo Foundation)

①Promotion of individual automobile measures

The automobile sector accounts for a large share of the energy consumed by the transport sector, so individual automobile measures have been implemented, including further improving fuel efficiency through the world's leading fuel efficiency technologies and measures to promote the use of automobiles with superior fuel efficiency and the use of clean energy vehicles.

■Fuel efficiency improvements through Top Runner Standards

○The Energy Saving Act and fuel efficiency standards (Top Runner Standards)

Improving the fuel and electric efficiency of automobiles is one of the crucial measures to reduce automobile CO_2 emissions and promote climate change mitigation. To promote the improvement of fuel and electric efficiency in automobiles, fuel efficiency standards (Top Runner Standards*) have been established based on the Act on Rationalization of Energy Use and Shift to Non-fossil Energy (Energy Saving Act).

As a result, automobile manufacturing industry members (automobile manufacturers and importers) are required to improve fuel and electric efficiency performance such that the average fuel and electric efficiency of vehicles sold (determined by taking the weighted harmonic average of automobile fuel efficiency values) does not fall below the standards set for each company based on their vehicle sales composition. Furthermore, it requires that they post fuel and electric efficiency related information so that automobile users can select automobiles with superior fuel and electric efficiency, and the fuel and electric efficiency values are listed in the product catalogs of individual automobiles.

* Top Runner Standards: Standards based on the currently commercially available automobiles with the highest fuel efficiencies, taking into consideration future technological advances

○Fuel efficiency standards

In March 1999 fuel efficiency standards for FY2010 were formulated for passenger cars and small trucks, based on the Top Runner Standards concept.

In March 2006 the world's first heavy duty vehicle (truck, bus, etc.) fuel efficiency standards were formulated, with a target year of FY2015.

In July 2007 new fuel efficiency standards were formulated for passenger cars. These new standards aimed for a 23.5% improvement in fuel efficiency (versus FY2004) for passenger cars by FY2015.

In March 2013 new fuel efficiency standards were created for passenger cars, aimed at FY2020, requiring fuel efficiency to be improved by 24.1% versus actual FY2009 figures, assuming a shipped vehicle composition equivalent to that of FY2009. Furthermore, in July 2015 fuel efficiency standards for FY2022 were formulated for small trucks, based on the assumption of equivalent shipment volume as in FY2012, requiring them to be 26.1% more fuel efficient than vehicles sold in FY2012 (based on actual FY2012 vehicle fuel efficiency).

In March 2019, fuel efficiency standards for FY2025 were formulated for heavy duty vehicles (trucks, buses, etc.), based on the assumption of equivalent shipment volume ratio as in FY2014, requiring them to be 13.5% more fuel efficient than FY2015 standards.

In March 2020, assuming that the ratio of vehicles shipped remains the same as that of FY2016, FY2030 was designated as the target year with new fuel efficiency standards, which also includes electric vehicles in its scope, formulated to improve fuel efficiency in passenger cars by 44.3% compared to the standard value for FY2020.

○Fuel and Electric Efficiency Testing Methods

With the establishment of new fuel efficiency standards, the method for testing fuel and electric efficiency was revised to more closely approximate actual driving conditions.

For passenger vehicles and small commercial vehicles, fuel efficiency tests were initially conducted using the 10–15 mode test cycle. However, with the establishment of the 2015 fuel efficiency standards, testing shifted to the JC08 mode, which involves driving with finer speed variations similar to actual driving conditions and starting the test from both warm and cold engine states.

Furthermore, the Worldwide harmonized Light duty driving Test Procedure (WLTP), an internationally unified testing method to properly evaluate the fuel and electric efficiency performance of vehicles, was adopted by the United Nations World Forum for Harmonization of Vehicle Regulations (WP29) in March 2014. In response, Japan introduced the WLTC mode in October 2016, based on the driving data from various countries including Japan and Europe, as an international harmonized cycle.

●Passenger vehicles

[Fixed-route buses (passenger vehicles with capacities of 10 or more and with a total vehicle weight in excess of 3.5 tons)] Target year: FY2025 Measurement methods: JH25 mode

Category (Total vehicle weight (t))	3.5～8	8～10	10～12	12～14	14～
Fuel efficiency standard (km/L)	7.15	6.30	5.80	5.27	4.52

[General buses (passenger vehicles with capacities of 10 or more and with a total vehicle weight in excess of 3.5 tons)] Target year: FY2025 Measurement methods: JH25 mode

Category (Total vehicle weight (t))	3.5～6	6～8	8～10	10～12	12～14	14～16	16～
Fuel efficiency standard (km/L)	9.54	7.73	6.37	6.06	5.29	5.28	5.14

[Gasoline passenger vehicles, diesel passenger vehicles, LP gas passenger vehicles, plug-in hybrid passenger vehicles and electric passenger vehicles (with occupancies of 9 people or less people or total vehicle weight of 3.5 tons or less)] Target year: 2030 Measurement method: WLTC mode

Fuel efficiency standard (FE) (km/L) in response to vehicle weight (M) (kg) is as follows.

M: less than 2,759kg

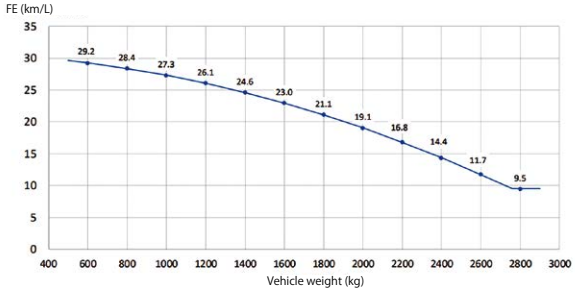
$$FE = -2.47 \times 10^{-6} \times M^2 - 8.52 \times 10^{-4} \times M + 30.65$$

M: more than 2,759kg

$$FE = 9.5$$

*FE is rounded up to two decimal points.

The relational expression of FE is shown in the graph below.



Source: MLIT (Tentative translation by Eco-Mo Foundation)

●Trucks/Freight vehicles

[Gasoline freight vehicles and diesel freight vehicles (total vehicle weight of 3.5t or less)] Target year: FY2022 Measurement method: JC08 mode or WLTC mode

Category (Total vehicle weight (kg))		～740	741 ～855	856 ～970	971 ～1080	1081 ～1195	1196 ～1310	1311 ～1420	1421 ～1530	1531 ～1650	1651 ～1760	1761 ～1870	1871 ～1990	1991 ～2100	2101～
Structure A Fuel efficiency standard (km/L)		28.1	25.0	22.7	20.8	18.5	16.9								
Structure B Fuel efficiency standard (km/L)	MT	21.0	20.4	19.9	19.4	16.7	15.1	13.9	12.9	12.1	11.5	11			
	AT	20.4	19.8	19.2	18.7	16.3	14.7	13.5	12.5	11.7	11.1	10.6	10.2		
Diesel structure B Fuel efficiency standard (km/L)	MT										16.8	15.9	15.2	14.6	
	AT										14	13.7	13.5	13.3	13

(Note)

Structure A: Vehicles with structures matching ① , ② , or ③ below.

① Maximum carrying capacity divided by total vehicle weight is 0.3 or less.

② The same cab contains both passenger boarding and article loading appurtenances, and the cab is separated from the outside of the vehicle by a fixed roof, window glass, or other partition.

③ There is an engine in front of the driving cabin.

Structure B: Vehicles to which none of the above apply.

[Trucks, etc. (freight vehicles with total vehicle weights exceeding 3.5t)] Target year: FY2025 Measurement method: Heavy duty vehicle mode

Category (total vehicle weight (t))	3.5～7.5				7.5～8	8～10	10～12	12～14	14～16	16～20	20～
(Maximum carrying capacity (t))	～1.5	1.5～2	2～3	3～							
Fuel efficiency standard (km/L)	10.83	10.35	9.51	8.12	7.24	6.52	6.00	5.69	4.97	4.15	4.04

[Tractors (freight vehicles with a total vehicle weight in excess of 3.5 tons)] Target year: FY2025 Measurement method: JH25 mode

Category (total vehicle weight (t))	～20	20～
Fuel efficiency standard (km/L)	3.11	2.32

Source: MLIT (Tentative translation by Eco-Mo Foundation)

■Measures for developing and promoting next-generation vehicles

Because Japan's overall CO_2 emissions, the transport sector occupies around 20% and around 90% of that is emissions from automobiles, the raising of fuel efficiency and emission performance in automobiles is extremely important. In addition, The "Green Growth Strategy Through Achieving Carbon Neutrality by 2050," formulated in June 2021, calls for comprehensive measures to be taken to achieve a goal in which *electrified vehicle (including hybrid EV and Plug-in hybrid EV) sales will account for 100% of new car sales by 2035 as well as for setting a new goal for commercial vehicles.

In order to promote environmental conservation, including CO_2 emission reduction, the Japanese government has positioned electric vehicles, fuel cell vehicles, plug-in hybrid vehicles, hybrid vehicles, clean diesel vehicles, and natural gas vehicles as "next-generation vehicles", and is promoting their widespread use.

Due to this, along with raising fuel efficiency through the establishment of standards and harmonizing international technical standards, measures are being carried out to encourage the promotion of the next-generation vehicles, beginning with tax benefits and support systems.

Specifically, by establishing fuel efficiency standards based on the Energy Saving Act and requiring automobile manufacturers to meet such standards, the promotion of highly fuel efficient automobiles, including the next-generation vehicles, is being encouraged. Also, Japan is taking the lead in establishing international standards for the next-generation vehicles, and this is expected to help expand such electrifying technologies as electric cars and fuel cell vehicles, improve Japan's automobile safety and environmental performance and strengthen the ability of international competition.

Furthermore, a tax benefits system for automobiles with excellent environmental performance, including the next-generation vehicles, is being established and eco-car tax reductions for greater environmental performance that exempt motor vehicle tonnage tax are being enforced in order to encourage promotion.

*Electrified vehicles: electric vehicles, fuel cell vehicles, plug-in hybrid vehicles, hybrid vehicles

Revision of automobile-related taxes (extension and revision of eco car tax reductions, etc.)

○Revisions such as raising fuel economy standards will be implemented in stages over a three-year period in consideration of technological developments other than electric vehicles, while maintaining the current tax breaks, such as tax reduction for eco cars, until the end of 2023, with a firm adherence to "business-private gap" for trucks, buses, and taxies.

Heavy-duty vehicles (trucks, buses)

Tax reduction for eco cars (Vehicle tonnage tax)

Applied period*1	FY2015 fuel economy standards 105%	110%	115%	Electric vehicles*2
①	▲50%	▲75%	Tax exemption	Tax exemption*3
②	▲25%	▲50%		

Applied period*1	FY2025 fuel economy standards 95%	100%	Electric vehicles*2
③	▲50%	Tax exemption	Tax exemption*3

Special provision on geener vehicles (Vehicle tax, Light vehicle tax)

Applied period*1	Electric vehicles*2
①②③	▲75%

Environmental performance discount (Vehicle tax, Light vehicle tax)

Applied period*1		FY2015 fuel economy standards Not met	100%	105%	110%	115%	Electric vehicles*2
①	Private	3%	2%	1%	Tax reduction		
	Business	2%	1%	0.5%			
②	Private	3%		2%	1%	Tax reduction	
	Business	2%		1%	0.5%		

Applied period*1		FY2025 fuel economy standards <95%>	95%	100%	105%	Electric vehicles*2
③	Private	3%	2%	1%	Tax reduction	
	Business	2%	1%	0.5%		

*1	①Deferral period	②After the end of deferral - 2nd year	③Third year
Vehicle tonnage tax	May-December 2023	January 2024 - April 2025	May 2025 - April 2026
Vehicle tax, Light vehicle tax	April - December 2023	January 2024 - March 2025	April 2025 - March 2026

Regarding (1), the treatment of clean diesel passenger cars in the fiscal year 2022 will remain unchanged until the end of 2023.
(Tax reduction for eco-cars (tax exemption for vehicles meeting the fiscal year 2020 fuel efficiency standards),
(Environmental performance discount (Achievement of the fiscal year 2020 fuel efficiency standards and 60% of the fiscal year 2030 fuel efficiency standards: tax-exempt))
*2 Electric vehicles, fuel cell vehicles, plug-in hybrid vehicles, natural gas vehicles
*3 Exemption from taxation for initial continuing inspections.

Passenger vehicles (private cars, taxies)

Tax reduction for eco cars (Vehicle tonnage tax)

Applied period*1	FY2030 fuel economy standards 60%	70%	75%	80%	90%	100%	120%	125%	Electric vehicles*2
①	▲25%		▲50%		Tax exemption		Tax exemption*3		
②	NA		▲25%	▲50%					
③	NA		Regular rate	▲25%	▲50%	Tax exemption		Tax exemption*3	

Special provision on geener vehicles (Vehicle tax, Light vehicle tax)

Vehicle tax Applied period*1		FY2030 fuel economy standards 70%	80%	90%	Electric vehicles*2
①②	Private	NA			▲75%
	Business	▲50%※4		▲75%※4	
③	Private	NA			
	Business	NA		▲75%※4	

*4 For light vehicle tax, read 50% to 25% and 75% to 50%.

Environmental performance discount (Vehicle tax, Light vehicle tax)

Vehicle tax Applied period*1		FY2030 fuel economy standards 60%	65%	70%	75%	80%	85%	90%	95%	Electric vehicles*2
①	Private	2%			1%	Tax exemption				
	Business	1%	0.5%		Tax exemption					
②	Private	3%		2%		1%	Tax exemption			
	Business	1%		0.5%		Tax exemption				
③	Private	3%			2%		1%	Tax exemption		
	Business	2%		1%		0.5%		Tax exemption		

Light vehicle tax Applied period*1		FY2030 fuel economy standards 55%	60%	70%	75%	80%	85%	Electric vehicles*2
①	Private	2%	1%		Tax exemption			
	Business	1%	0.5%					
②	Private	2%		1%	Tax exemption			
	Business	2%	1%	0.5%				
③	Private	2%			1%	Tax exemption		
	Business	2%		1%	0.5%			

Source: MLIT (Tentative translation by Eco-Mo Foundation)

In addition, for the next-generation vehicles, such as electrified vehicles and plug-in hybrid vehicles that are used for commercial purposes, including buses, taxis and trucks, partial support for vehicle prices when they are introduced is being carried out.

In particular, ultra-small electrified mobility vehicles that are compact, agile, exceptionally environmentally performative, are an easy means for moving around local areas, and are for around one to two passengers. Procedures were streamlined and the revising of the certification system was carried out in January 2018. For ultra-compact mobility vehicles with a maximum speed of less than 60 km/h intended for mass production, the standard was revised in September 2020 to promote vehicles that can travel freely on public roads without any restrictions on users or driving areas.

In addition, in light of the fact that Road Traffic Act was revised in April 2022 to define "specified small motorized bicycles" as a new vehicle category for electric kickboards, etc., the safety standards for "specified small motorized bicycles" were established in December 2022.

②Promotion of environmentally friendly automobile usage

"Eco-driving" has been positioned as an environmentally friendly automobile usage promotion measure. The Eco-Drive Promotion Liaison Committee (National Police Agency (NPA), METI, MLIT, and MOE) formulated the "Eco-Driving Dissemination and Promotion Action Plan", and the Committee and related organizations are actively promoting these efforts.

In 2006 the committee proposed the "10 Tips for Eco-driving", which outlined specific eco-driving efforts. These recommendations were revised in January 2020.

●10 Tips for Eco-driving

10 Tips for Eco-driving

Eco-driving consists of driving techniques and mentalities that conserve fuel, reduce CO_2 emissions, and help prevent global warming. Eco-driving also helps reduce traffic accidents. Fuel-efficient driving is not only gentle on the wallet, but is also safer, putting passengers at ease. Calm driving at ease, with plenty of time to spare, is also a form of eco-driving. Eco-driving is something that anyone can start doing right away. Little changes to your driving mentality and habits can improve your driving and create a better society. Let's start eco-driving, beginning with the basics you can immediately put into action.

1 Understand your own fuel efficiency.

Make it a habit to have an understanding of the fuel efficiency of your own vehicle. If you have a grasp of your normal fuel efficiency, you will have a real understanding of the effects of your own eco-driving. It is useful to use tools that support eco-driving such as the fuel efficiency monitoring equipment fitted in your vehicle, eco-driving navigation or fuel efficiency management on the internet.

2 Accelerate gently eStart.

When setting off, be gentle on the accelerator. (You should aim to reach around 20km/h in 5 seconds.) Just by doing this on a daily basis, you can improve your fuel efficiency by around 10%. Unrushed, gentle acceleration also contributes to safe driving.

3 Maintain a steady speed and keep your distance.

Try to maintain a steady speed when you are driving. If you are too close to the vehicle in front of you, you are more likely to speed up or reduce speed unnecessarily and this reduces fuel efficiency by around 2% in urban areas and 6% in the suburbs. Try to drive with as few speed changes as possible depending on the traffic.

4 Slow down by releasing the accelerator.

If you know you are going to stop, for example, at traffic lights, take your foot off the accelerator early. This is called engine braking and improves fuel efficiency by 2%. Try using engine braking when you are slowing down or going down hills.

5 Make appropriate use of your air conditioner.

Air conditioners (A/C) in cars cool and dehumidify the interior of the car. If you only need the heater, turn the A/C switch to OFF. For example, even if the car temperature is set to 25℃, the same as the external temperature, if you leave the A/C switch to ON, fuel efficiency reduced by around 12%. In addition, even when you do need the air conditioner, make sure that the car interior isn't too cool.

※1 Please be careful when switching off your engine at intersections as it can cause the following safety issues. (There are no issues for cars that do this automatically.)
- If you press the brake pedal a number of times while you are stopped, it can affect the effectiveness of the brakes.
- If you are not used to doing this, you may make a mistake or be late in moving again. There may also be cases in which the engine does not start up again due to decreased lifespan of parts such as the battery.
- As safety devices such as airbags and direction indicators do not activate, it is better not to switch off your engine if you are near the front of the queue or on a hill.

※2 It is perfectly OK to warm up your car as you drive unless under special circumstances such as cold regions with a temperature of -20℃.
※3 Tire pressure decreases by around 5% in a month.
※4 If the value is 50kPa (0.5kg/cm²) less than the recommended value.

6 Don't warm up or idle your engine.

When the car is stopped when you are waiting for someone or you are loading or unloading something, do not let the engine idle *1. Ten minutes of idling (with the A/C set to OFF) consumes around 130cc of fuel. In addition, modern vehicles do not normally need to have their engines warmed up *2. You should start moving as soon as you have started the engine.

7 Leave in plenty of time and avoid congestion.

Before you leave, use traffic information about traffic jams and regulations, etc. as well as maps and your satnav to check your destination and route. For example, if you get lost on a one-hour drive and drive for an extra 10 minutes, the amount of fuel consumed increases by 17%. You can save both time and fuel by checking traffic information while you are driving to avoid traffic jams.

8 Check and maintain your car regularly, starting with tire pressure.

Make it a habit to check your tire pressure *3. If tire pressure is less than the recommended value, fuel efficiency decreases by around 2% in urban areas and 4% in the suburbs *4. You can also improve fuel efficiency if you regularly change the oil, the oil filter, the air cleaner element and so on.

9 Reduce your load.

Unload anything unnecessary from your vehicle. Fuel efficiency is greatly affected by the weight of what is in your car. For example, if you load an object weighing 100kg and then drive, fuel efficiency decreases by around 3%. It is also sensitive to air resistance. Remove external equipment such as ski carriers, etc. when you are not using them.

10 Do not obstruct the flow of traffic when you are parking.

Do not cause obstructions when you park. Parking in this way near intersections, for example, causes traffic jams. Not only does it reduce fuel efficiency for other vehicles, it also causes accidents. When there are no obstructions to the flow of traffic, average speed is improved and reductions in fuel efficiency are prevented.

The Eco-Drive Promotion Liaison Committee

(Metropolitan Police Department, METI, MLIT, Ministry of the Environment)

The Eco-Drive Promotion Liaison Committee website →

Source: The Eco-Drive Promotion Liaison Commitee (Tentative translation by Eco-Mo Foundation)

Column

Definition of the levels and the status of initiatives regarding autonomous driving

In recent years, owing to technological innovation, initiatives toward autonomous driving are making headway and attention is being focused on the trends.

In "Public Private ITS Initiative/Roadmaps 2017," the Japanese government adopted the definition of SAE International's J3016 (September, 2016) as the definition for the levels of autonomous driving.

●Summary of the definition of autonomous driving (J3016)

Level	Summary	Main respondent to surveillance for safe driving
Driver carries out all or part of the driving tasks		
SAE Level 0 No automatic driving	· The driver carries out all of the driving tasks	Driver
SAE Level 1 Driver assistance	· The system carries out the driving subtask of either front/back or left/right vehicle control	Driver
SAE Level 2 Partial automatic driving	· The system carries out the driving subtask of both front/back and left/right vehicle control	Driver
Autonomous driving system carries out all of the driving tasks		
SAE Level 3 Conditional automatic driving	· The system carries out all driving tasks (within designated domain) · If continuous operation is difficult, the driver is expected to respond appropriately to the system's requests for intervention	System (Driver, when continuous operation is difficult)
SAE Level 4 Advanced automatic driving	· The system carries out all driving tasks (within the designated domain) · If continuous operation is difficult, the user is not expected to respond.	System
SAE Level 5 Complete automatic driving	· The system carries out all driving tasks (not limited to the designated domain) · If continuous operation is difficult, the user is not expected to respond.	System

Source: Home page of Prime Minister of Japan and the Cabinet
(Tentative translation by Eco-Mo Foundation)

MLIT has started an autonomous driving service at semi-mountainous areas with Roadside-station (michi-no-eki) as the base. In semi-mountainous areas with a super-aging population, a goal has been set of introducing autonomous driving services focusing on local hubs such as Roadside-station, and an experiment has been carried out to verify the feasibility of securing the flow of both people and goods.

●Example of a vehicle

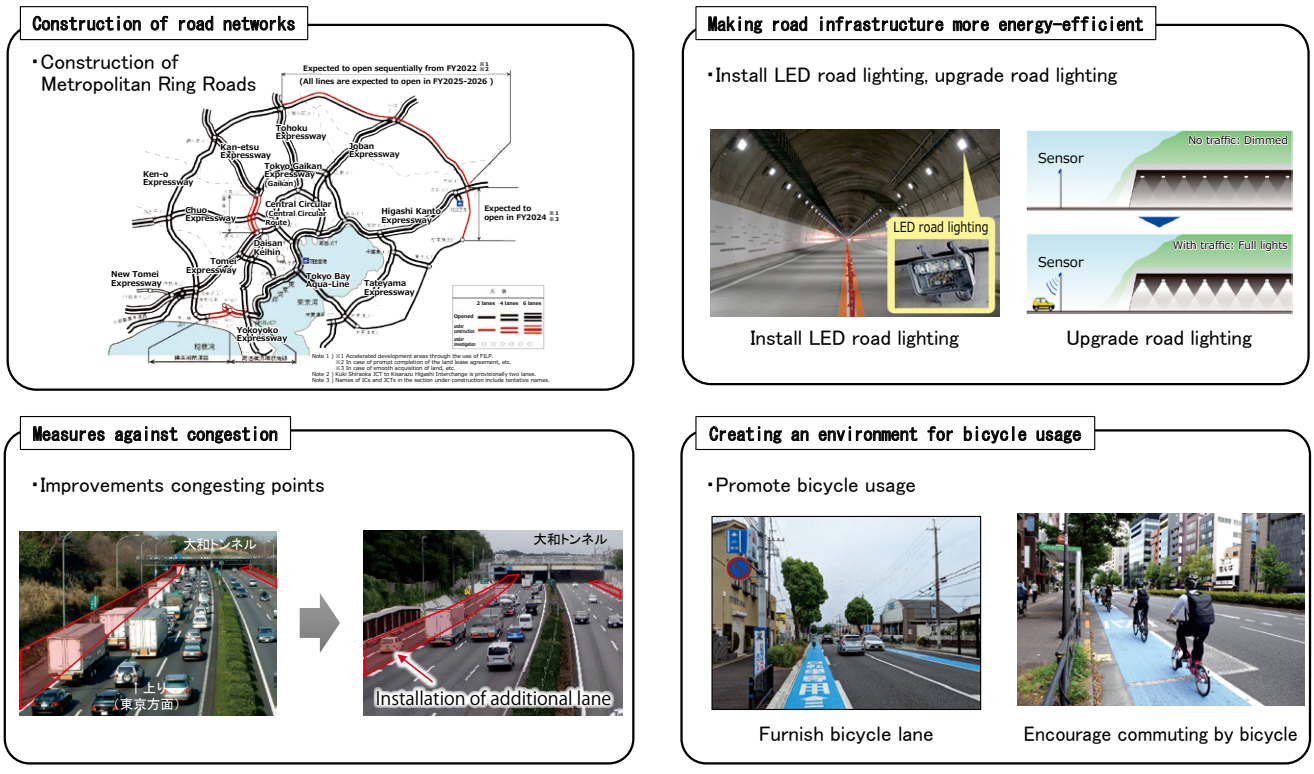
This experiment includes motor-driven carts running on a designated route by sensing the magnetic force from the underground electromagnetic induction line, and motor-driven carts identifying the vehicle position based on GPS and running on a designated route.

Based on the experimental results, as of April 2023, full-scale implementation is being carried out in four locations nationwide, namely: "Michi no Eki Kamikoani" (Akita Prefecture), "Michi no Eki Okueigenji Keiryu no Sato" (Shiga Prefecture), "Miyama City Hall Yamakawa Branch Office" (Fukuoka Prefecture), and "Michi no Eki Akagi Kogen" (Shimane Prefecture).

③Promotion of Decarbonization Initiatives on Roads

The Ministry of Land, Infrastructure, Transport and Tourism (MLIT) is promoting various decarbonization initiatives on roads, such as improving fuel efficiency through the smooth flow of traffic to enhance driving speeds and reducing carbon dioxide emissions from automobiles.

Specifically, MLIT is promoting efforts to strengthen arterial road networks, including ring roads, which contribute to the reduction of carbon dioxide emissions, as roads are developed. These include taking targeted measures to traffic congestion bottleneck points based on scientific analysis of big data utilizing ETC2.0 and consideration of introduction of planar congestion control measures including toll policies for traffic demand adjustment utilizing ICT, AI, etc. MLIT is also promoting efforts to make road infrastructure more energy-efficient by switching road lighting to LED or by upgrading it, and to realize energy-creating road infrastructure by promoting the introduction of renewable energy from solar power generation using road space for electricity needed for road management. In addition, MLIT is promoting efforts to create an environment for bicycle use, including support for the formulation of bicycle use promotion plans by local governments, development of bicycle traffic space networks, improvement of bicycle parking facilities, and promotion of shared bicycle use, in coordination with safety assurance measures to promote bicycle usage.



Source: MLIT (Tentative translation by Eco-Mo Foundation)

④Improvement of freight distribution efficiency

■Creation of sustainable logistics systems through collaboration between freight owners and logistics operators

○Green Logistics Partnership Conference

Promoting the creation of a greener overall logistics system requires greater collaboration between freight owners and logistics operators, and the expansion of sustainable logistics systems for global warming countermeasures improving productivity, etc.

The "Green Logistics Partnership Conference", launched in 2004 and composed of companies and organizations united by this goal, strives to promote mutual understanding of the importance of the Green Logistics and improve coordination between freight owners and logistics operators, in order to carry out modal shifts and improve truck transport efficiency.

As part of this activities, "Joint Guidelines on the Method for Calculating CO_2 Emissions by the Logistics Sector" (METI and MLIT) were formulated. These guidelines establish a unified method of calculating carbon dioxide emissions by the logistics sector, and can be used by both freight owners and logistics operators for smoother collaboration, and to enable objective evaluation of the effectiveness of each initiative. Particularly successful good practice example projects involving logistics operators and freight owners engaging in partnerships to reduce CO_2 emissions, to create sustainable logistics systems for improving productivity, etc. are recognized by MLIT Minister awards and METI Minister awards.

Source: MLIT (Tentative translation by Eco-Mo Foundation)

■Promotion of modal shift and increased efficiency of freight distribution

○Enhanced coastal shipping competitiveness and modal shift to sea transport

The MLIT is engaged in efforts aimed at strengthening the competitiveness of the coastal shipping industry and promoting a modal shift to sea transport.

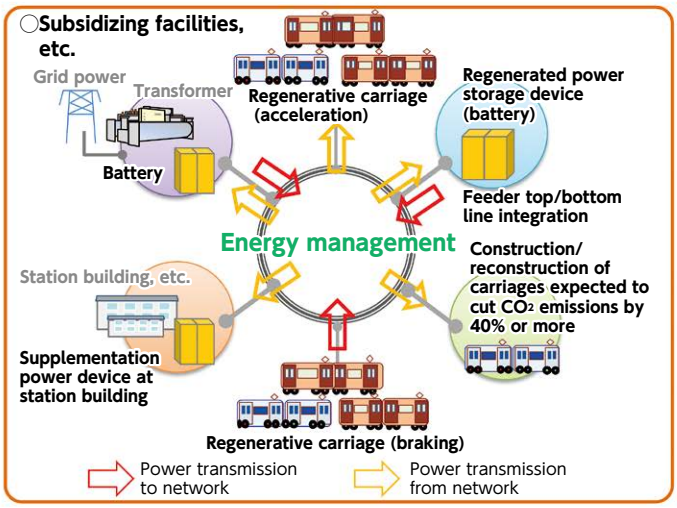
As part of these efforts it is implementing the "Eco-Ship Modal Shift Project", which promotes modal shift by selecting companies which contribute to modal shift by using some degree of sea transport, and permitting those companies to use the Eco-Ship Mark. As part of this project, the Eco-Ship Modal Shift Project Executive Committee has implemented an Eco-Ship Mark certification system (the Eco-Ship Mark indicates that a company is contributing to environmental efforts by using sea transport). As of May 2023, 189 freight owners and 213 logistics operators have received Eco-Ship Mark certification. Eco-Ship Mark certified companies that have made particularly large contributions are also selected to receive Director-General, Maritime Bureau, Ministry of Land, Infrastructure, Transport and Tourism awards.

(Poster of invitation for Eco-Ship Mark certification)
Source: Committee for Implementation of Eco-Ship Modal Shift Operations

○Project to promote network low carbonization in railroad businesses, etc.

Railroads are essential means of transport in the daily lives and economic activities of the people of Japan. One of their notable features is that they have a smaller environmental impact than other modes of transport. In order to further promote reductions in CO_2 emissions by railroads and develop circular and ecological economies, MLIT and MOE are working together to support deployment of state-of-the-art energy-saving facilities and devices that use energy efficiently through a project to promote network low carbonization in railroad businesses, etc.

●Project to promote network low carbonization in railroad businesses, etc.



Source: MOE (Tentative translation by Eco-Mo Foundation)

○ "Eco Rail Mark" system promotion and expansion

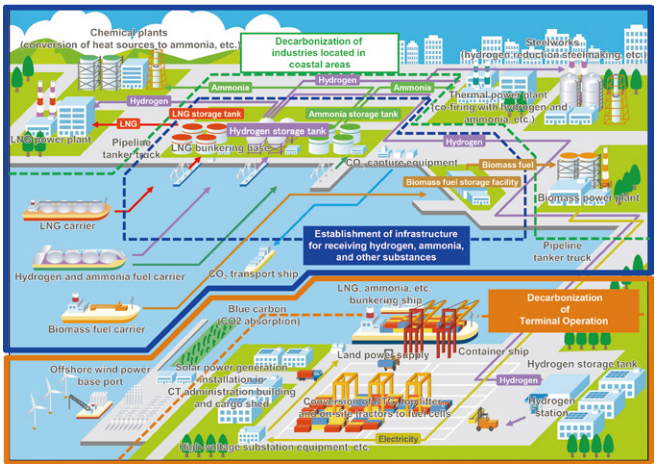
The "Eco Rail Mark" was established in FY2005 to certify companies and products which are proactively working to achieve low environmental impact rail freight transport. By supporting companies and products certified with the "Eco Rail Mark", awareness of environmental impact reduction efforts increases, among freight owner companies such as manufacturers, as well as consumers, with the goal of promoting a corresponding modal shift to rail freight transport. MLIT and the Railway Freight Association (RFA) are striving to further promote and expand the "Eco Rail Mark". As of November 10, 2023 there are 163 "Eco Rail Mark" product certifications for 187 products, 100 certified companies, and 51 certified supporting companies.

Source: RFA

○Promotion of Carbon Neutral Port

MLIT is promoting Carbon Neutral Port (CNP) initiative to contribute to strengthening the competitiveness of our country's ports and industries and the realization of a decarbonized society. This includes the decarbonization of terminal operation and the development of an environment for receiving hydrogen, ammonia etc. MLIT has provided support for the development of Port Decarbonization Promotion Plans prepared by port management bodies based on the Port and Harbour Act, including assistance and advice for plan development.

●An image of specific efforts to establish Carbon Neutral Ports (CNP)



Source: MLIT

Additionally, the project promoted the development of LNG bunkering bases, the introduction of onshore power supply facilities for vessels at berth, the introduction of offshore wind power generation, the introduction of low-carbon cargo handling equipment,

consideration of the introduction of cargo handling equipment powered by hydrogen, and the used of blue carbon, among others.

○Approval of Distribution Integration Efficiency Plans based on the Act on Advancement of Integration and Streamlining of Freight Distribution Business (Distribution Integration Efficiency Act).

In order to increase distribution efficiency and reduce environmental impact, plans have been approved for a project aimed at integrating and improving the efficiency of advanced freight distribution facilities with a specified minimum scale (specified freight distribution operation facilities) and other facilities. Roughly 300 projects have been approved since the establishment of "Distribution Integration Efficiency Act" on October 1, 2005.

On October 1, 2016, a revision to the Act was enacted, requiring two or more parties to collaborate during the implementation of projects. This revision was enacted in response to labor shortages in the distribution field, with the aim of expanding modal shifts among support recipients and measures which do not require joint delivery, etc., specified distribution operation facilities.

Based on this, as of the end of December, 2023, 405 diverse projects, including modal shifts, joint delivery, and special freight distribution operation facility wait time reduction, have been approved, and measures have been implemented to achieve freight distribution labor savings, improve freight distribution efficiency, and reduce environmental impact. On July 27, 2020, approval was given for the first time in Japan for a plan to simultaneously convert two modes of transport, marine and rail, at the same time.

Distribution Integration Efficiency Act and labor savings

Overview of the Distribution Integration Efficiency Act

Revision enacted October 1, 2016

Objectives

- Secure labor required for freight distribution operations
- Reduce environmental impact,etc

Overview of system

The system approves projects in which two or more parties collaborate to integrate distribution operations (integrating transport, storage, freight handling, and distribution processing) and make them more efficient (transport rationalization), contributing to environmental impact reductions and labor savings (distribution operation integration efficiency projects), and provides support to approved parties.

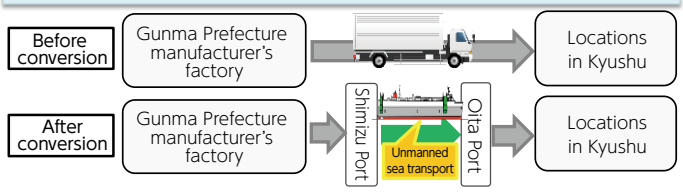
Main support measures

① Project startup/implementation support
- Plan formulation expense and operation expense subsidies, etc.

② Support for necessary facilities and equipments, etc.
- Special taxation structures for transport-linked warehouses (warehouses with truck arrival time reservation systems, etc.)
  →Corporate tax: 8% additional depreciation deduction (5 years)
  →Fixed property tax: 1/2 taxation base (5 years), etc.
- Consideration of facility location restrictions, etc.
  →Consideration for permission to perform development in urbanization control areas

Example of Freight Distribution Integration Efficiency Act approval

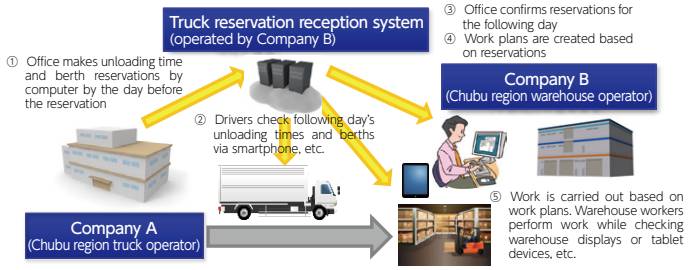
<Example 1> Sea transport used for portion of trunk transport



○ Reduction of driver operating hours 2,976 hrs/yr (67% reduction)
- Drive time reductions contribute to reductions in drives involving overnight stays.

○ CO_2 reduction ratio: 78%

<Example 2> Introduction of truck reservation reception system into warehouse, dramatically reducing truck wait time and improving efficiency of work within the warehouse



○ The introduction of the truck reservation reception system improved freight receiving work efficiency, cutting wait times by 80%

○ CO_2 reduction ratio: 22.9%

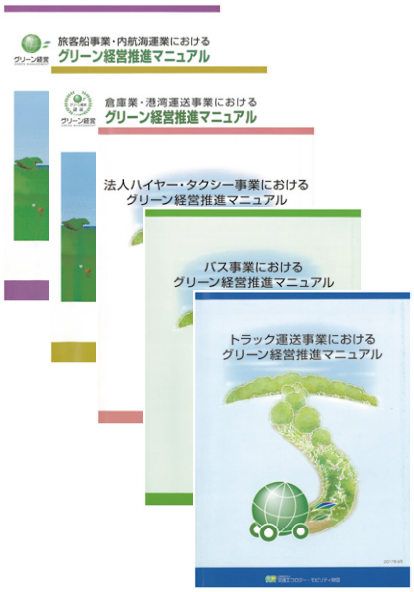
Source: MLIT (Tentative translation by Eco-Mo Foundation)

Promotion of the Green Management Certification System

In recent years there has been an increasing focus on environmental problems such as global warming and air pollution. Satisfying both environmental and economic concerns and creating a sustainable economic society has become an urgent challenge. The Eco-Mo Foundation has created and distributed green management promotion manuals containing checklists for self-assessment in order to promote environmental conservation activities by transport related companies. This manual, based on the concepts of ISO14031 (an international environmental performance evaluation standard), contains checklist items for environmental conservation items to be addressed, and descriptions of specific corresponding environmental efforts. This makes it easy to set and evaluate environmental targets, thereby achieving greener management.

(Poster of Green Management Certification System)

Green management consists of companies assessing their own environmental conservation efforts, using promotion manuals as references in considering improvement measures based on the results of these environmental conservation efforts, creating action plans which include these improvement measures, and implementing them in order to achieve the improvements. This cycle makes it possible to implement proactive, ongoing environmental conservation activities.



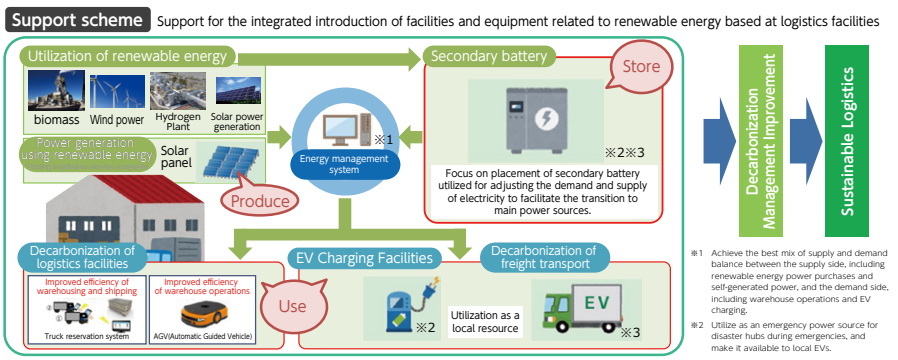
(Green Management Promotion Manuals)

The MLIT is striving to promote this green management as a countermeasure against environmental problems.

In order to promote green management, the Green Management Certification System was established in 2003. The Eco-Mo Foundation acts as the certification body under this system, objectively certifying and publicizing environmental improvement efforts by companies, based on the green management promotion manuals. This produces greater understanding and motivation of the green management certified businesses by other companies and users, with the ultimate objective of reducing the environmental impact of the transport industry.

Promoting Decarbonization in Distribution Operations

Facilitation of the decarbonization of distribution operations by supporting initiatives that provide integrated and efficient energy supply to logistics facilities such as warehouses and truck terminals, as well as EV trucks, through initiatives such as the installation of renewable energy facilities utilizing roofs and premises of logistics facilities.



Source: MLIT (Tentative translation by Eco-Mo Foundation)

⑤Promotion of usage of public transport

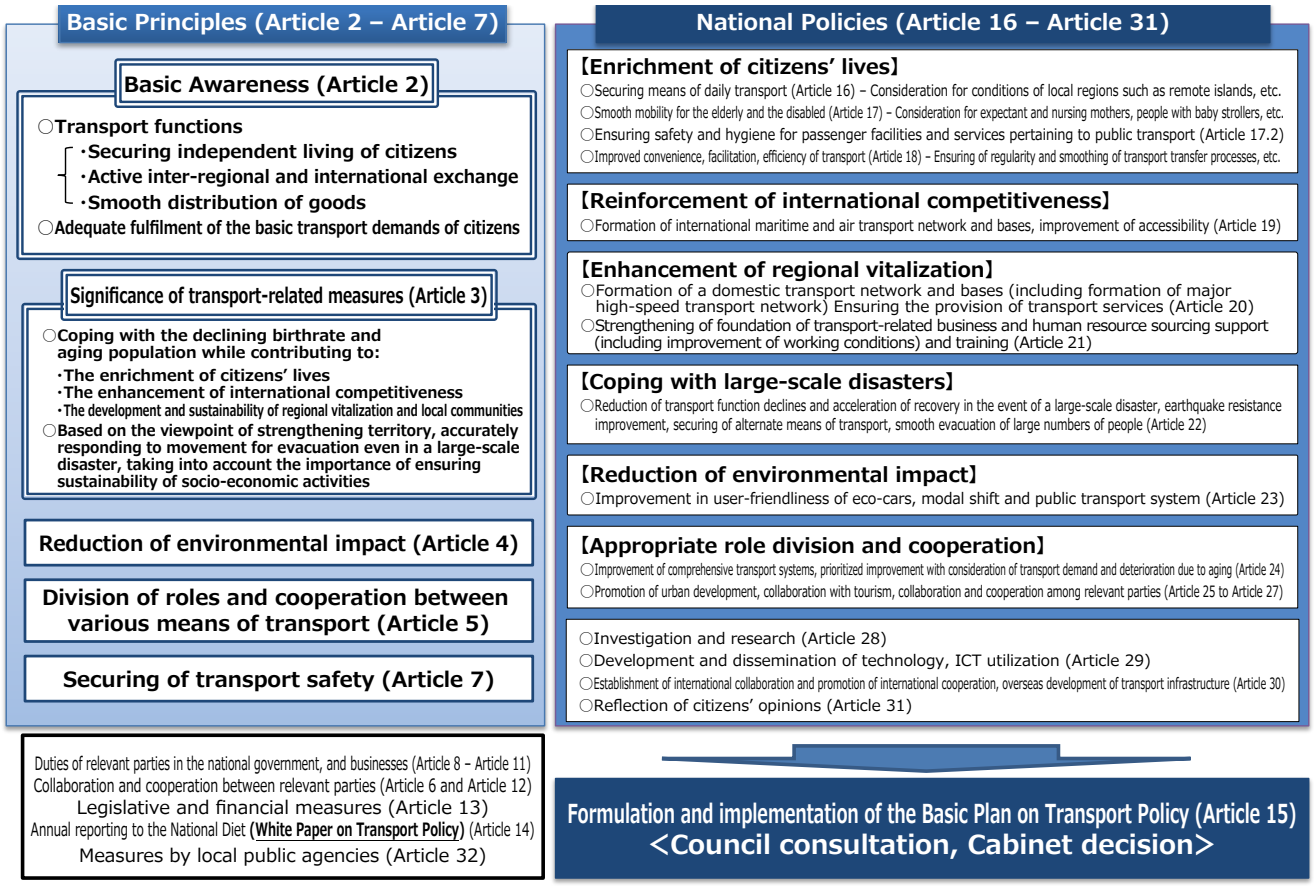
Creating new railroad lines and new transport systems, and making rail and bus transport more convenient, contribute a shift in passenger transport from private cars to public transport, which has less of an environmental impact. This leads to reductions in automobile CO_2 emissions, so various measures are being implemented in order to achieve this shift.

■Establishment of the Basic Act on Transport Policy

The Basic Act on Transport Policy defines the basic philosophy underpinning transport related measures in order to promote measures necessary for the national government to coordinate closely with local governments and transport companies in implementing comprehensive and systematic measures from the perspectives of increasing international competitiveness and regional vitality, and ensuring preparedness for large-scale disasters. This act applies to the international transport, national transport, and regional transport which acts as the infrastructure supporting Japan's economic and social activities. The Second Basic Plan on Transport Policy, endorsed by the Cabinet on May 28, 2021, covers the period from FY2021 to 2025, and based on this plan, transportation-related measures have been promoted in a comprehensive and systematic manner.

The Basic Act on Transport Policy requires that a white paper on the transport policy be approved by the Cabinet and reported to the Diet every year. The 2023 edition of the white paper was approved by the Cabinet and reported to the Diet in June 2023.

●Summary of the Basic Transport Policy Plan



Source: MLIT (Tentative translation by Eco-Mo Foundation)

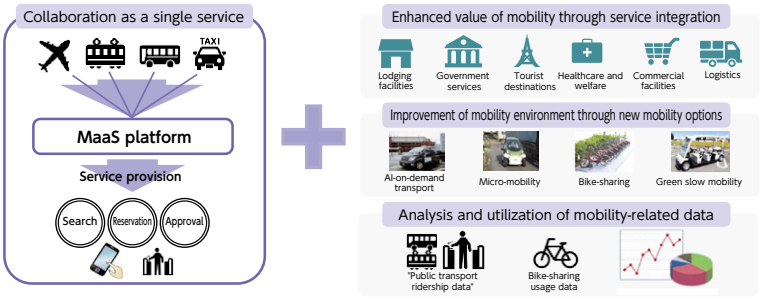
■Promotion and support for Japanese MaaS

Support is being provided for the creation of the infrastructure needed for the new mobility service, Mobility as a Service (MaaS), as well as for the construction of MaaS and its widespread use, which will help solving local issues. The objective of these efforts is to achieve nationwide use of MaaS, secure and enrich transport in rural areas and tourist destinations, and maintain and invigorate public transport.

Co-creation MaaS Project

○We are implementing support for initiatives related to **"co-creation" (collaboration and cooperation) utilizing digital technology such as MaaS** among various stakeholders in the region.

- **Japanese MaaS promotion and support project**
  - Support initiatives for wide-area collaboration and cross-sector collaboration using MaaS, promoting "co-creation" among transport operators and operators from other sectors.
- **Support for the introduction of new mobility options (such as AI-on-demand transport, green slow mobility, bike-sharing, electric scooters, etc.)**
- **Support for the introduction of transport services utilizing My Number cards**
- **Support for the development of new mobility service business plans**



Traffic Digital Transformation (Infrastructure development for implementing MaaS)

- **Support for the introduction of cashless payments (IC cards, QR code and touch payments, facial recognition, etc.)**
  - By realizing seamless mobility through cashless transactions, it becomes possible to enhance services through the accumulation of payment data and address challenges such as labor shortages in the transport sector (priority support for the introduction of cloud-based cashless payment systems).
- **Support for data digitization (standardization of bus information using GTFS, congestion information provision system)**
  - To achieve data collaboration within regions and across wide areas, we aim to enhance and uplift small- and medium-sized businesses that have not yet undergone digital transformation. This involves improving the efficiency and sophistication of management and services through DX (Digital Transformation).

Gate machines with QR code reading functionality

Standardization of bus information

Source: MLIT (Tentative translation by Eco-Mo Foundation)

■Green Slow Mobility

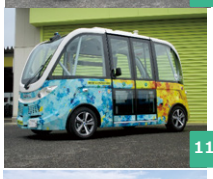
Based on the Paris Agreement that was concluded in 2015, the aim is to reduce greenhouse gas emissions to essentially zero by the latter-half of the 21st century within a global framework. In Japan, the aim is to achieve a carbon neutral, decarbonized society with greenhouse gas emissions at zero overall by 2050.

At the MLIT, Green Slow Mobility aims to solve various transport problems in local areas, such as the securing of transport services where societal aging is advancing and the development of new sightseeing mobility for tourist attractions. Simultaneously it also aims to spread low carbon mobility in local areas.

Green Slow Mobility is a small mobility service that utilizes electrified vehicles that can travel on public roads at speeds of less than 20 kilometers per hour. A decarbonized transport system can be realized through not only introducing green slow mobility but also utilizing electricity generated from renewable energy sources such as solar power and wind power.

Green Slow Mobility : A small mobility service that utilizes electrified vehicles that can travel on public roads at speeds of less than 20 kilometers per hour.

【Features of GSM】
①**Green**･･･Eco-friendly transport service utilizing electrified vehicles
②**Slow**･･･Enjoy the scenery, suitable for residential roads, reduce the number of serious accidents occurred
③**Other**･･･Smaller, more open, and easier to get on and off compared to vehicles with the same capacity

Light vehicles	Small vehicles	Standard-sized vehicle
 4-person	 5-person	 10-person
 4-person	 6-person	 11-person
 4-person	 7-person	 18-person

* A midsize vehicle driving license is required to operate vehicles bearing 11 people

Green Slow Mobility, which is specialized for short-distance travel at low speed, is expected to provide new transport services that complement existing transport systems to introduce the "one last/first mile" for local residents and new mobility for tourists, as well as to encourage local activities.

①Transporting rural residents
1）Areas without bus service
2）Areas with a high proportion of elderly residents
3）Improving welfare for the elderly
4）Conversion from existing buses

② Mobility for tourists
1）Sightseeing tours by guides
2）Short-term regular tourist buses
3）Park-and-ride
4）Events

③Short rides
From parking spaces to facilities, or between facilities

④Local branding
As the "face" of the area

Source: MLIT (Tentative translation by Eco-Mo Foundation)

■Measures for promoting rail use

The Ministry of Land, Infrastructure, Transport and Tourism (MLIT) promotes the use of railway by supporting for constructions of connecting lines between routes, mutual direct connections, subway constructions, and comprehensive renovation at railway stations.

It is also collaborating with rail operators

●Examples of Service and Convenience Improvement Measures

◆Urban Railway Convenience Enhancement Project
・Eastern Kanagawa Railway Link Project (Sotetsu/Tokyu Link Line)

◆Urban Railway Construction Project (Subway Construction Project)
・Naniwasuji Line, Tokyo Metro Yurakucho Line extension, Tokyo Metro Namboku Line extension

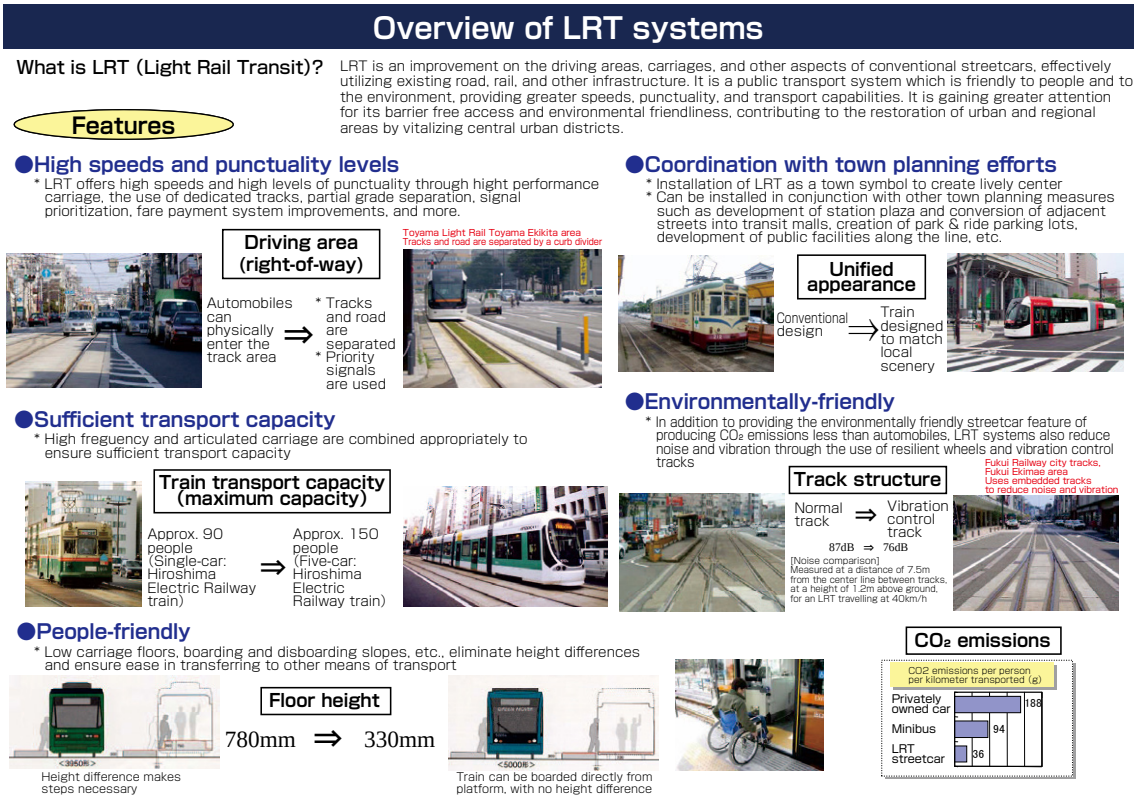
◆Railway Station Comprehensive Improvement Project
Keihin Kyuko Railway Shinagawa Station, Sagami Railway Ebina Station, Odakyu Railway Chuo-Rinkan Station, Odakyu Railway Tsurukawa Station, JR Tokai Kariya Station, JR West Shimogion Station

in the "Eco Rail Campaign", promoting the use of rail transport as an handy environmental action.

Support for the establishment of next generation streetcar systems (LRTs*), which are increasingly in the spotlight, is being provided as part of the Ministry's project of "Initiative to promote the improvement of reception environments with a focus on post-COVID-19 measures."

* LRT: Short for "Light Rail Transit". These next generation streetcar transport systems use low-floor trams (LRVs), improve their track and stop to provide easy boarding and unboarding, punctuality, travel speed, comfort, and other features.

●Overview of LRT systems



Source: MLIT (Tentative translation by Eco-Mo Foundation)

■Regional Transport Law (Act on Vitalization and Rehabilitation of Local Public Transport Systems)

The situation surrounding regional public transport has become increasingly challenging due to long-term declines in demand resulting from population decrease, as well as decreases in supply due to shortages of drivers and other personnel.

Meanwhile, the number of elderly people giving up their driver's licenses remains high, and it is becoming increasingly important to ensure that there is a means of transport that supports them.

Efforts have been made by local governments to ensure mobility for residents, with 905 regional public transport plans being created by January 2024, based on the Regional Transport Law, to facilitate sustainable regional passenger transport services.

Moreover, recognizing the ongoing challenges, efforts have been made to promote coordination and collaboration among stakeholders at the local level as a national responsibility. These efforts include the full enforcement of the revised Regional Transport Law in October 2023, which incorporates mechanisms for the reconstruction of local railways, the establishment of area-wide comprehensive agreement operation projects, and the expansion of the Road Transport Advanced Project, among others. Additionally, necessary budgets have been allocated to support initiatives such as demonstration operations facilitated by cooperation and collaboration

(co-creation) among various stakeholders in the region, business improvement support through DX (Digital Transformation) and GX (Green Transformation) by transport operators, and the development of railway and bus facilities through the Social Capital Development Comprehensive Subsidies. These measures aim to reconstruct regional public transport effectively.

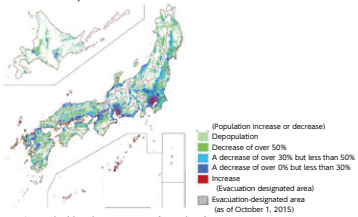
Furthermore, considering the discussions at the Regional Public Transport Re-Design Implementation Conference (Chair: Minister of Land, Infrastructure, Transport and Tourism), established under the Digital Smart City National Concept, MLIT will collaborate with relevant government agencies to accelerate the "re-design" of regional public transport to enhance convenience, productivity, and sustainability. MLIT will continue to maximize the use of all policy tools available.

●The environment surrounding regional public transport

- ○ It is predicted that the population of Japan will decrease by more than 50% in over half of the residential areas nationwide by 2050.
- ○ The decrease in local small- and medium-sized shops, the consolidation or relocation of hospitals, and the consolidation of schools have exacerbated the issue of "mobility" in daily life, such as shopping, medical visits, and commuting to school.
- ○ With an increasing proportion of dual-income households, including those with part-time employment, the burden of transport for elderly individuals' medical visits and children's commute to school or extracurricular activities has also increased.
- ○ There is growing concern about traffic accidents involving elderly drivers, leading to voluntary surrender of driving licenses. However, there are also voices expressing concerns about alternative means of transport after surrendering licenses, as well as hesitation regarding voluntary surrender.
- ○ There is a need for new approaches to transport within urban areas and between regions, considering the rapid recovery of inbound tourism and lifestyle changes (such as diverse working styles and a focus on quality of life).

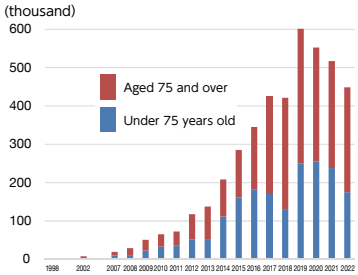
Population projections for the future

By 2050, the population is projected to decrease by over 50% in approximately half of the populated mesh areas nationwide compared to 2015.



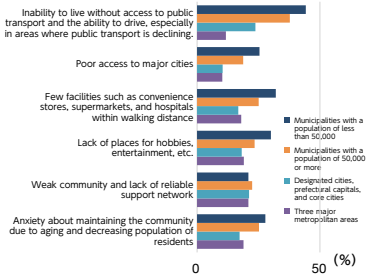
Source: Compiled by the Ministry of Land, Infrastructure, Transport and Tourism based on the "2015 National Census" by the Ministry of Internal Affairs and Communications and the "Regional Future Population Estimates for Japan (Estimates for 2018)" by the National Institute of Population and Social Security Research.

The trend in the number of license returns



Source: Compiled by the Ministry of Land, Infrastructure, Transport and Tourism from publicly available data from the National Police Agency

Issues regarding residential areas (by region)



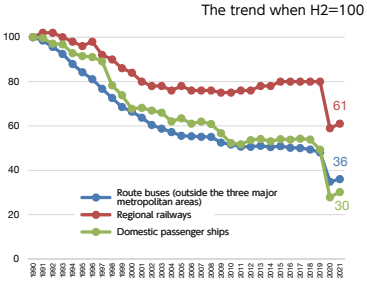
Source: Ministry of Land, Infrastructure, Transport and Tourism, "National Survey of Public Awareness, FY2017"

Source: MLIT (Tentative translation by Eco-Mo Foundation)

●The current situation of public transport operators

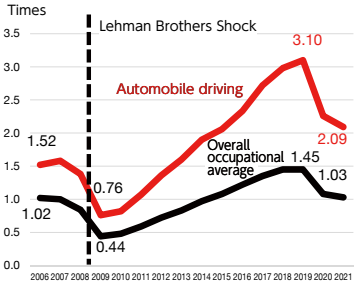
- ○ The management environment of public transport operators has deteriorated due to long-term decreases in users and sharp declines caused by the COVID-19 pandemic. Even after the pandemic, the number of users has not fully recovered to pre-pandemic levels.
- ○ Many operators of route buses and regional railways are in deficit, and the prospects for recovery are bleak. This poses challenges for the stable provision of public transport services in the future.
- ○ The wage levels for drivers of automobiles (buses and taxis) are low, and the shortage of personnel is worsening (the effective job openings-to-applicants ratio is about twice the average for all occupations). There is a risk of an expanding trend of route bus closures or suspensions due to the shortage of personnel.
- ○ In the transport sector, many operators are lagging behind in efforts to implement digital transformation (DX) in areas such as cashless payment compatibility, operation management, vehicle and facility management, and labor management.

The number of users of route buses, regional railways, and domestic passenger ships



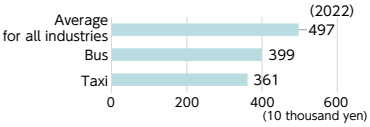
Source: Compiled by the Ministry of Land, Infrastructure, Transport and Tourism based on the "Automobile Transport Statistics Yearbook," "Railway Statistics Yearbook," and surveys conducted by the Maritime Bureau of the Ministry of Land, Infrastructure, Transport and Tourism based on the Ordinance concerning regular report submissions by ship operators, etc.

Shortage of personnel in the automotive driving industry



Source: Compiled by the Ministry of Land, Infrastructure, Transport and Tourism based on the "General Occupational Introduction Status" from the Ministry of Health, Labour and Welfare

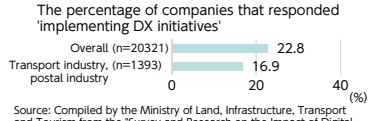
Wage levels for automobile drivers



Source: Estimated by the Ministry of Land, Infrastructure, Transport and Tourism based on the "Basic Survey on Wage Structure" by the Ministry of Health, Labour and Welfare

The status of DX initiatives by industry

The percentage of companies that responded 'implementing DX initiatives'



Source: Compiled by the Ministry of Land, Infrastructure, Transport and Tourism from the "Survey and Research on the Impact of Digital Transformation on the Economy" by the Ministry of Internal Affairs and Communications, 2021

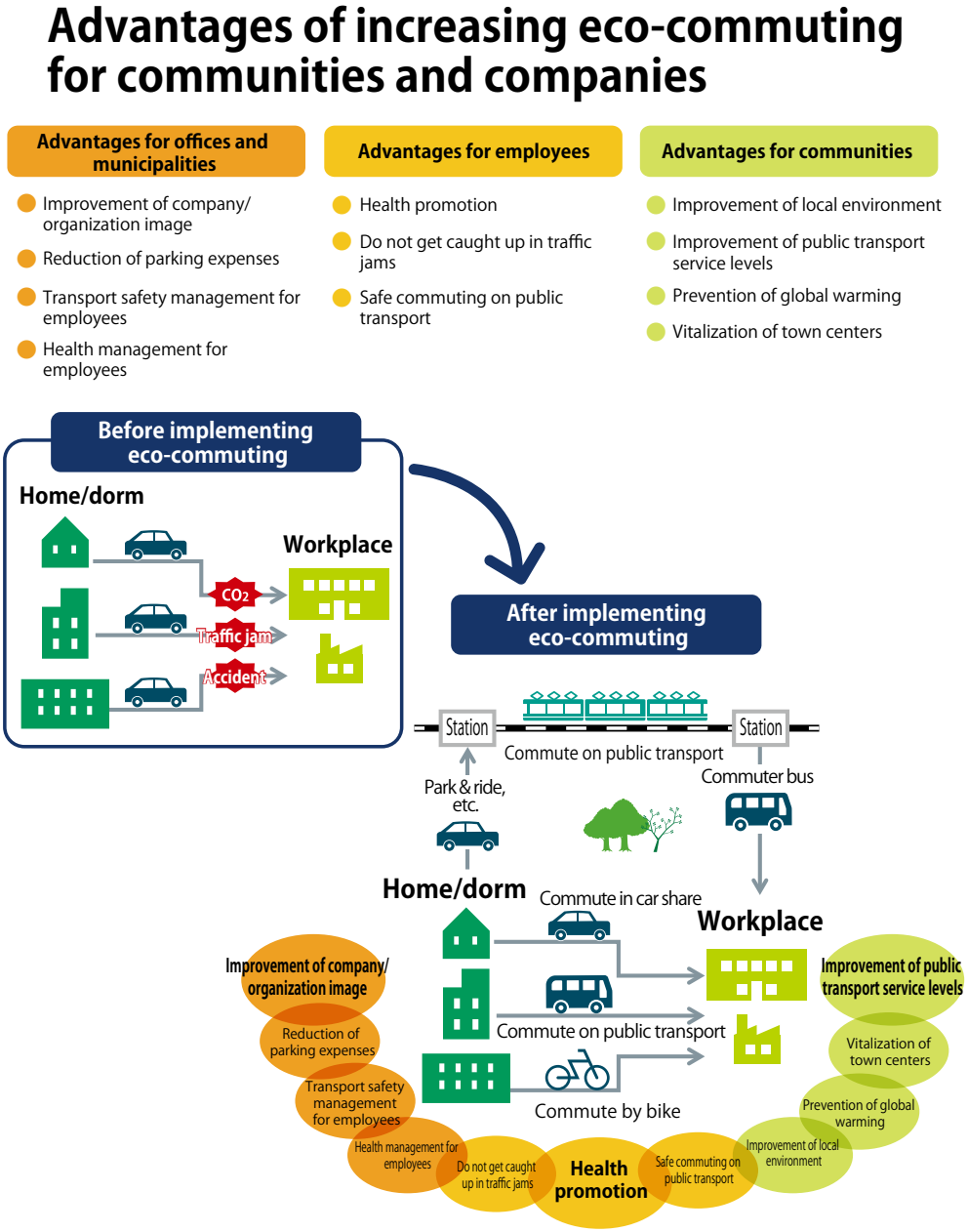
Source: MLIT (Tentative translation by Eco-Mo Foundation)

Promotion of eco-commuting

There is a growing demand for a shift in means of transport, from the use of private cars to low carbon dioxide emission measure, by promoting the use of public transport. In order to promote highly effective measures which match both user side efforts and transport operator side efforts, a Conference on Promotion of Public Transport was held in March 2005, involving transport operators, members of the business sector, and members of the government.

In November 2007 the "Eco-commuting Promotion Action Program through the Mobility Management Project" was adopted to promote conversion from the use of private cars to public transport, bicycles and on foot for commuting.

Furthermore, from June 2009, thereby promoting eco-commuting, the "Excellent Eco-Commuting Business Site Certification System" was launched to certify businesses which voluntarily and actively promoted eco-commuting. As of the end of December 2023, 839 business sites have been registered.

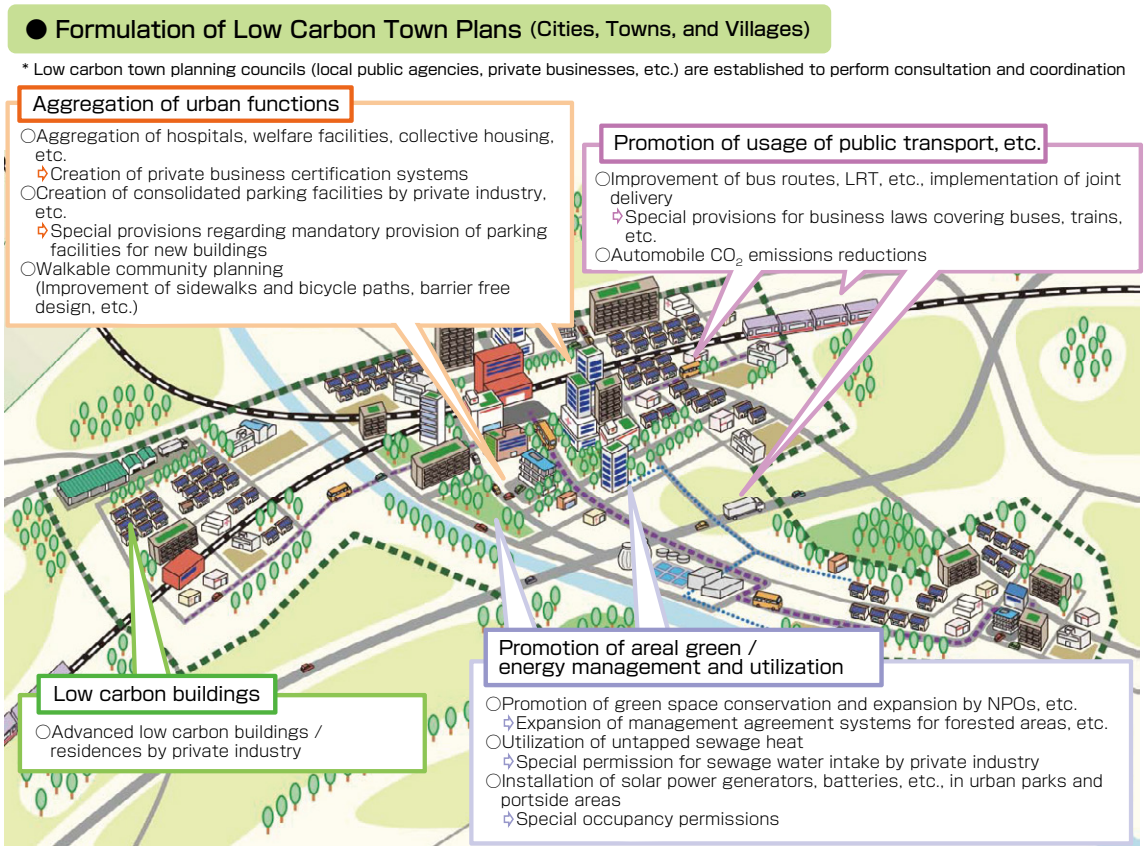


Source: MLIT (Tentative translation by Eco-Mo Foundation)

■Low Carbon City Promotion Act

It is important to build up a collection of success cases of rationalization of energy usage and urban and transport carbon emissions reduction, to promote the greater adoption and to vitalize the housing market and local economies, by encouraging private investment in urbanization areas, etc. based on changes in energy supply and demand triggered by the Great East Japan Earthquake and increasing energy and global warming awareness among citizens.

The Low Carbon City Promotion Act was passed by the Diet in September 2012 and enacted in 2012 December of the same year. As of December 2023, 26 cities have created low carbon town plans. These plans are listed on the MLIT website.



Source: MLIT (Tentative translation by Eco-Mo Foundation)

⑥Promotion of Environmentally Sustainable Transport (EST)

In order to reduce carbon dioxide emissions by the passenger transport sector, it is important to implement measures to reduce the excessive dependence on private vehicles, which account for the majority of the sector's emissions, and promote the use of public transport, etc. It is essential, when doing so, to employ measures which reflect the local area's features, and for measures to be driven by the community with the collaboration of related parties.

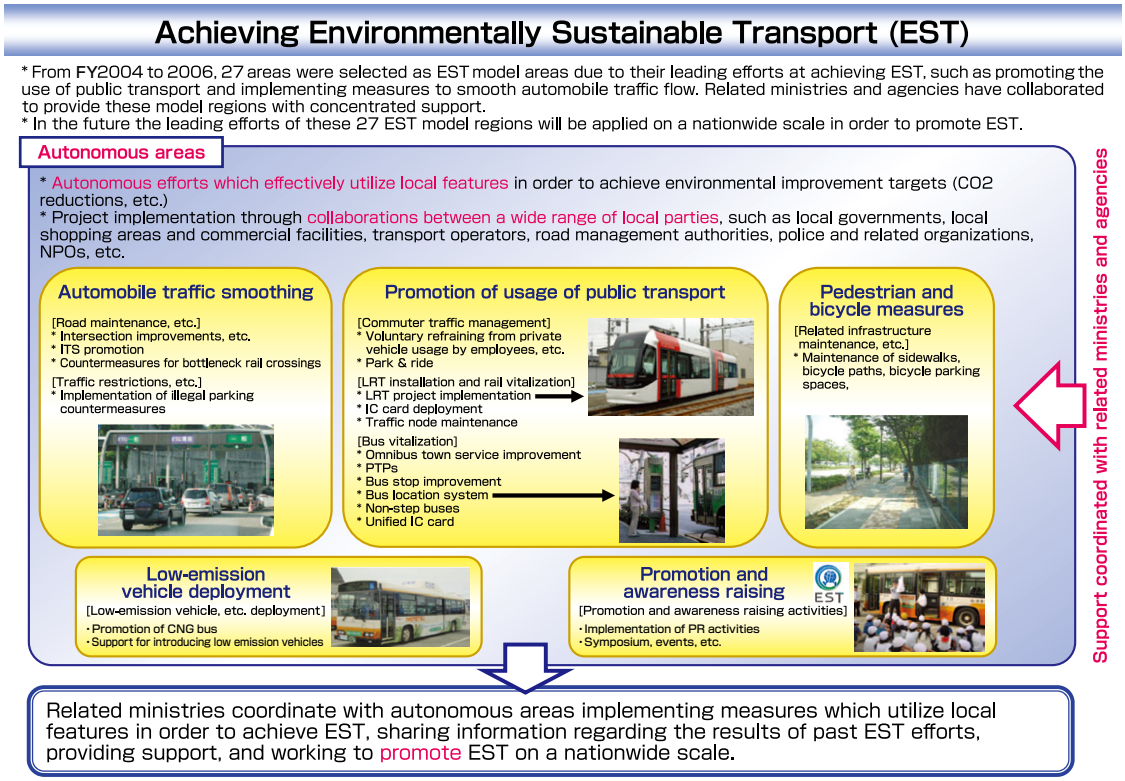
In order to achieve this, the MLIT has implemented an "EST Model Project", selecting areas which are implementing leading efforts at achieving "Environmentally Sustainable Transport (EST)", and related ministries and agencies collaborate to provide support in the areas such as promoting the use of public transport, implementing measures to smooth automobile traffic flow, promoting the use of low-emission vehicles, and promoting awareness raising.

Over the three year period projects. Related from FY2004 to 2006, 27 areas were selected as EST Model Project areas, and each area has implemented three year model projects related ministries and agencies are coordinating with each other, providing support and making information regarding the results of these projects available in order to expand EST to a nationwide scale. As part of these efforts, the MLIT website provides an EST Database with the results of these model projects, sharing information about how to effectively implement EST activities.

●MLIT website "EST Database"

Source: MLIT website

●Promotion of Environmentally Sustainable Transport (EST)



Source: MLIT "White Paper on Land, Infrastructure, Transport and Tourism in Japan" (Tentative translation by Eco-Mo Foundation)

Regional EST Forum in Asia

The motorization that has accompanied economic development and urbanization in Asia has produced severe social issues such as air pollution. The "Regional EST Forum in Asia" has been held by the United Nations Centre for Regional Development (UNCRD) and the MOEJ with the aim of achieving Environmentally Sustainable Transport (EST) in the Asian region. Currently, there are roughly 300 members, both from Japan and other Asian countries, including high level government officials in charge of environmental and transport agencies, local governments, environmental and transport experts, and Asian and European international support organizations, ADB and NGOs, etc.

The first Forum was held in August 2005 in Nagoya and attended by a total of 13 Asian countries. Its objective was to promote EST, then being advanced by the OECD, throughout Asia. To achieve this, it adopted the "Aichi Declaration," which set out the fundamental philosophy of EST in Asia, the importance of transport for solving the problems faced by socially vulnerably people and the poor, based on the MDGs that served as the basis of SDGs, and formulated a strategic plan and action plan for each country, led by the UNCRD.

The Forum has been held continuously in Asian countries roughly once a year since then, and the number of participating countries and attendees has grown. In 2010, the Bangkok Declaration for 2020, which laid out the targets for the years leading up to 2020, was adopted, promoting EST-related measures in each country.

On the global level, in 2015, the United Nations Headquarters adopted the "2030 Agenda for Sustainable Development," which set forth 17 international targets, called SDGs. In the same year, the Paris Agreement on climate change was adopted with the consent of all countries. It aims to create sustainable, rich societies in which no one is left behind, while at the same time demanding major changes in societies, which until now have been predicated on the use of fossil fuels. Against this backdrop, at the 10th Forum held in Vientiane, Laos, in 2017, the member states adopted the "Vientiane Declaration" which applied the SDG approach to EST.

With regard to the recent EST Forum, the 13th Forum was held with the main theme of “Changing the course of Asia’s transport sector through transformational change” and discussed situations after the “Bangkok Declaration 2020”. Due to the impact of COVID-19, the Forum was held online for the first time with approximately 300 participants as in the past years. In October 2021, the 14th Forum was held online at “Aichi Sky Expo (Aichi International Exhibition Center)”. In this Forum, “Aichi 2030 Declaration” was adopted, setting out EST goals by 2030 in line with international trends including the SDGs and the Paris Agreement to accelerate the decarbonization movement in Asia. In October 2023, the 15th Forum was held in Kuala Lumpur, Malaysia, and under the theme of “Investing in Sustainable Transport: Catalyzing Economic and Social Development in the SDGs Era,” the Forum shared policies in each country and exchanged a wide spectrum of opinions on EST, as well as following up on the progress made in each country towards the accomplishment of goals set forth in the Aichi 2030 Declaration.

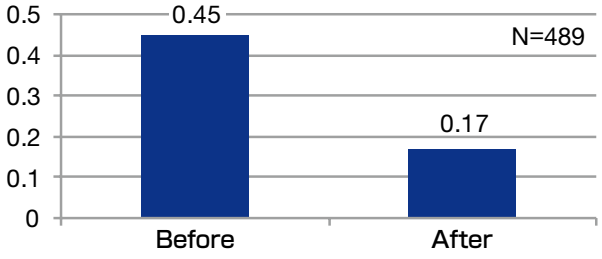
Column

Effectiveness of car sharing in reducing environmental impact

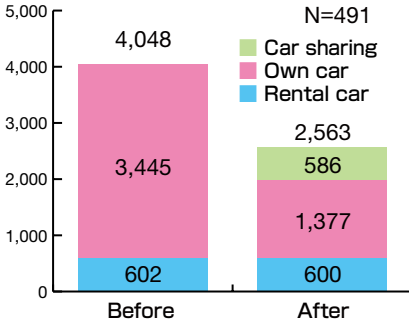
Car sharing, which allows people to use cars only when needed without owning them, has been popular worldwide, and in Japan, the number of car-sharing users exceeds 3 million (according to an Eco-Mo Foundation survey conducted in March 2023).

In FY2012 the Eco-Mo Foundation performed an evaluation of the effectiveness of car sharing at reducing environmental impact. A survey of car sharers was carried out with the cooperation of five major car sharing operators. The survey found a decrease of over 60% in the number of cars owned per household after joining a car sharing scheme, a decrease of just under 40% in average annual miles driven, and an average annual reduction in automobile CO_2 emissions of 0.34t (45%). A report containing detailed survey results and measures for popularizing car sharing in the future can be found on the Eco-Mo Foundation website.

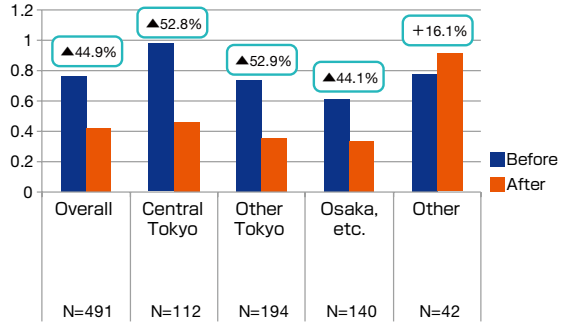
●Change in average number of automobiles owned per household



●Changes in annual total distance driven (km/year/household)



●Change in annual CO_2 emissions from automobile use (t-CO_2/year/household)



Note 1) Central Tokyo: Chiyoda-ku, Minato-ku, Chuo-ku, Shibuya-ku, Shinjuku-ku, Bunkyo-ku, Toshima-ku

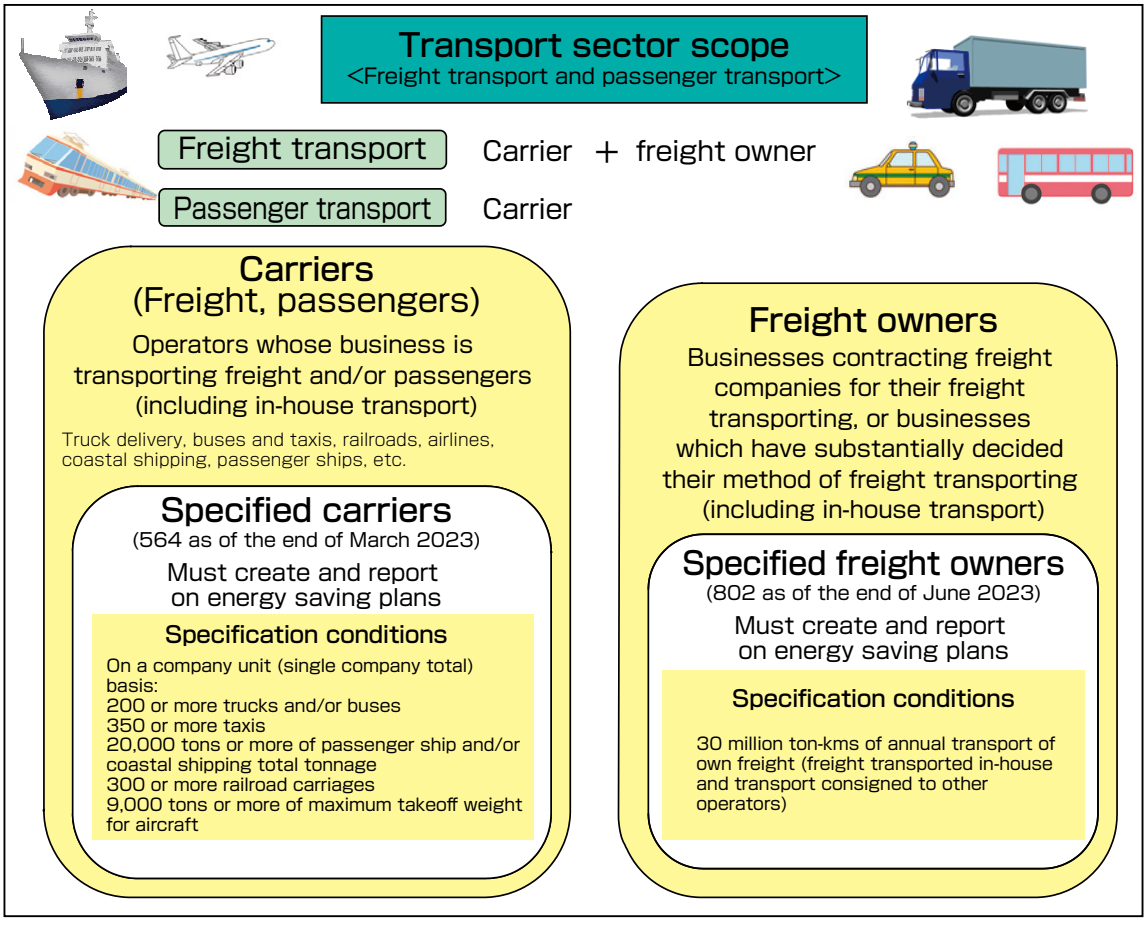
Note 2) Osaka, etc: Osaka Prefecture, Hyogo Prefecture, Kyoto Prefecture, Aichi Prefecture, Kanagawa Prefecture

(2) Energy Saving Act-based measures

The steady implementation of energy saving measures is an important challenge in tackling global warming.

The Energy Saving Act requires businesses to rationalize energy use based on the criteria set by the government. In particular, businesses whose energy consumption exceeds a certain amount are required to report their actual energy consumption (periodic report), prepare a medium- to long-term (3–5 years) plan for rationalization of energy consumption (medium- to long-term plan) and submit it to the government every fiscal year.

In addition to these efforts, the revised Energy Saving Act, which was passed in May 2022, requires businesses to switch to non-fossil energy sources to achieve carbon neutrality by 2050 in response to the growing environmental awareness in recent years. The name of the law was revised to "Act on Rationalization of Energy Use and Shift to Non-fossil Energy" from "Act on Rationalizing Energy Use" in line with the content. Under the revised Energy Saving Act, businesses are required to set targets for the conversion to non-fossil energy and take respective measures based on the criteria for businesses converting to non-fossil energy newly established by the government, while continuing to rationalize overall energy use as before. Specific carriers and shippers are also required to submit reports on their medium- to long-term plans for transitioning to non-fossil energy sources, as well as regular reports on overall energy usage, including non-fossil energy, along with a medium- to long-term plan for rationalization of energy use.



Specified carriers designation status (total of 564 companies as of the end of March 2023)

	Freight				Passengers				Aviation	Total
	Railway	Commercial trucks	Private trucks	Shipping	Railway	Buses	Taxis	Shipping		
No. of carriers	1	301	76	35	26	90	20	13	2	564

[Overview of determination criteria for carriers with respect to energy usage rationalization, etc.]

The following items are specified.

(1) From a medium- and long-term perspective, each carrier should set as a target an annual average reduction of 1% or more in energy consumption rates or electricity demand equalization evaluation rates.

(2) Carriers should formulate policies indicating their energy saving efforts, and appoint energy saving measure administrators and establish promotion systems for energy saving measures.

(3) Carriers should strive to perform the following.

	Items to be addressed (energy conservation criteria)
Common	· Enhance collaboration with freight owners and other carriers
Rail	· Introduce energy saving trains · Expand the size of universal containers and introduce freight trains capable of carrying large containers · Secure a transport capacity which accurately matches transport demand by adjusting the number of trains operated, etc. · Perform appropriate train inspections and maintenance
Automobiles	· Introduce low-emission vehicles and high fuel efficiency tires · Promote eco-driving through driver education and the use of digital drive records and eco-driving management systems · Promote increases in truck and trailer sizes in accordance with freight volume · Perform cooperative delivery and improve loading rates through securing return cargo, etc.
Ships	· Introduce high fuel efficiency ships and low friction ship-bottom paint · Use on-land power supply systems · Promote increases in ship sizes in accordance with freight volume · Perform joint delivery to improve loading rates
Airplanes	· Introduce airplanes with superior energy usage efficiency · Rationalize ground operation energy usage · Promote appropriate equipment selection in accordance with freight volume · Coordinate aircraft operation, such as by reducing ferry flight distances

【Freight owner's decision criteria】

From a medium- and long-term perspective, freight owners will aim for an annual average reduction of 1% in energy consumption rates or electricity demand equalization evaluation rates by implementing measures such as those below:

- Appointing energy saving measure officers
- Providing in-house training
- Selecting environmentally-friendly cargo carriers (carriers who have obtained ISO14001 or green management certifications)
- Promoting modal shifts
- Shifting from the use of private trucks to commercial trucks
- Performing joint delivery with other companies
- Reducing redeliveries

etc.

●Criteria for transport operators for non-fossil energy conversion

Targets related to the conversion to non-fossil energy for transport

Transport Business	Approximate Quantitative Targets	Guideline for Qualitative Targets
Small truck (8 tons or less)	Replace 5% of the fleet with non-fossil energy vehicles by FY2030	Increase in the share of non-fossil energy in the use of electricity for vehicles
Large truck (Over 8 tons)	None (Considering setting quantitative guidelines by FY2030)	Introduce non-fossil energy vehicles by FY2030 (including the establishment of an operational structure)
Bus	Replace 5% of fleet with non-fossil energy vehicles by FY2030	Increase in the share of non-fossil energy in the use of electricity for vehicles
Cab	Replace 8% of the fleet with non-fossil energy vehicles by FY2030	Increase in the share of non-fossil energy in the use of electricity for vehicles
Railroad	Convert 59% of electricity consumption to non-fossil energy in FY2030 (for electric vehicles)	Introduction of electric, FC, or non-fossil energy vehicles (including establishment of an operation system) by FY2030 (for internal combustion vehicles)
Ship	None (Considering setting quantitative guidelines by FY2030)	Introduction of hydrogen FC, battery, and LNG carriers from the late 2020s onward (including establishment of operational systems, etc.)
Aircraft	The percentage of SAF use in fuel use in FY2030 shall be 10%*. * Total of international and domestic flights	Proactive introduction of aircraft equipped with new aircraft environmental technology

Measures to be taken to achieve the goal of non-fossil energy conversion

Transport Business	Measures to be taken
Automobile (trucks, buses, cabs)	(1) Introduction of non-fossil energy vehicles (EVs, FCVs, PHEVs, non-fossil fuel vehicles) (2) Use of non-fossil fuels instead of fossil fuels (3) Introduction of charging and other infrastructure integrated with (1) (4) Cooperation, investigation and study with related parties (government agencies, manufacturers, shippers, etc.) toward (1) or (2). (5) Select a high non-fossil energy rate for electricity used in EVs and PHEVs.
Railroad	(1) Conversion of externally procured electricity to non-fossil fuel, acquisition of non-fossil fuel certificates, etc. (2) Installation of photovoltaic power generation equipment, etc. (3) Introduction of electric or fuel cell vehicles (4) Use of non-fossil fuels in place of fossil fuels (5) Cooperation, investigation and study with related parties (government agencies, manufacturers, etc.) toward (3) or (4).
Ship	(1) Introduction of ships that use non-fossil energy such as hydrogen FC ships (2) Introduction of LNG carriers for future use of synthetic fuels, etc. (3) Use of non-fossil fuels (4) Cooperation with related parties (government agencies, manufacturers, shippers, etc.), surveys and studies for (1) to (3) (5) Utilization of onshore power supply system at anchor
Aviation	(1) Proactive use and expansion of SAF (2) Introduction of equipment equipped with new environmental technology (3) Cooperation with related parties (government agencies, manufacturers, shippers, etc.) toward (1) or (2) (4) GPU (ground power unit) is given priority
Common to all modes	(1) Efforts to switch to non-fossil energy in cooperation and collaboration with shippers, users, or other businesses

【Shipper's Criteria】

Transport Machinery and Equipment	Approximate Quantitative Targets	Guideline for Qualitative Targets and Measures to be Taken
Small truck (8 tons or less)	5% of vehicles used for transport both for private use and dedicated use by shippers will be replaced with non-fossil energy vehicles in FY2030.	○Conducting technical development and demonstration tests of vehicles and other equipment that use non-fossil fuels in cooperation with transport companies and manufacturers of vehicles and other equipment. ○Conducting technical development and demonstration experiments of non-fossil fuels in cooperation with manufacturers and others related to non-fossil fuels ○Establishment of operational rules for the introduction plan and delivery plan for vehicles, etc. that use non-fossil energy and for refueling and recharging infrastructure in cooperation with other shippers, quasi-shippers, freight forwarders, etc. ○Conversion to non-fossil energy through the development and supply of non-fossil energy production facilities in cooperation with energy suppliers, etc.
Large truck (Over 8 tons)		
Railroad		
Ship		
Aircraft		

(3) International maritime and air transport sector countermeasures

■Introduction of international maritime transport CO_2 regulations

The International Maritime Organization (IMO) is discussing uniform worldwide measures for reducing carbon dioxide (CO_2) emissions from international maritime transport, which are not included in the scope of individual countries' activities based on the Kyoto Protocol or the Paris Agreement. In April 2018, the IMO adopted the "IMO GHG Reduction Strategy", the first commitment in the world to zero greenhouse gas (GHG) emissions in a single sector as soon as possible during this century, and discussions are currently underway to develop an international framework for GHG reduction.

At the IMO meeting in June 2021, they decided to adopt a treaty on a new CO_2 emission regulation for the world's large ocean-going vessels, the "Energy Efficiency Existing Ship Index (EEXI) and Carbon Intensity Indicator (CII) Rating System," based on a joint proposal led by Japan to encourage existing ships not subject to CO_2 emission regulations to improve fuel efficiency and operations. This regulation will come into effect in 2023.

The "GHG Reduction Strategy" is to be revised in the spring of 2023, and discussions are underway internationally for the revision. At the IMO meeting in November 2021, Japan, along with other countries including the United States and the United Kingdom, jointly proposed a new goal of "Net Zero GHG emissions by 2050 (carbon neutrality by 2050)" for the revision of this strategy.

In order to achieve the global GHG reduction targets, Japan, which has excellent energy-saving technology, will take the lead in formulating an international framework in order to reduce GHG in the IMO to improve international competition in the international maritime industry.

■International air transport sector greenhouse gas emissions reduction measures

In 2022, the 41st General Conference of the International Civil Aviation Organization (ICAO) adopted carbon neutrality by 2050 as a global long-term reduction target for greenhouse gas emissions in the international aviation sector. Moreover, "Carbon Offsetting and Reduction Scheme for International Aviation" (CORSIA), which offsets CO_2 emissions in excess of the baseline through a market mechanism by utilizing sustainable aviation fuels (SAF), improving operational methods, and introducing new aircraft technologies, was also reviewed in the General Conference. It is anticipated that after this review, the emission reduction obligations for international aviation beyond 2024 will increase.

Achieving these long-term goals and emission reduction obligations requires improvements in operational methods, the introduction of new aircraft environmental technologies, and the promotion of SAF utilization. Therefore, in November 2023, the International Civil Aviation Organization (ICAO) held the "Third Meeting on Aviation and Alternative Fuels (CAAF/3)." During this meeting, they agreed on a global framework, including targets to reduce greenhouse gas emissions by 5% compared to jet fuel usage by 2030 through SAF utilization, as well as policy tools to promote SAF manufacturing and utilization, and support for developing countries.

●Decarbonization Initiatives at the International Civil Aviation Organization (ICAO)

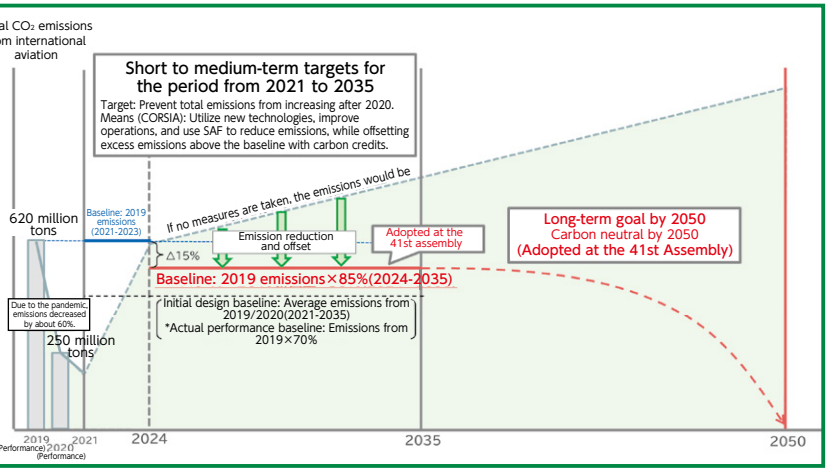
Global Reduction Target (LTAG)

- ○ Ensure that total emissions do not increase after 2020 (below the total emissions of 2019).
- ○ Improve fuel efficiency by 2% annually.
- ○ Achieve carbon neutrality by 2050 as a long-term goal.

CORSIA
(Carbon Offsetting and Reduction Scheme for International Aviation)

✓Each airline operating international flights must offset the increase in CO_2 emissions from the baseline using the following measures:
① Introducing new environmental aircraft technologies
② Improving operational methods
③ Utilizing sustainable aviation fuels (SAF).
Additionally, any remaining emissions exceeding the baseline must be offset through market mechanisms (carbon credits). The baseline is set at the emissions level of 2019 until 2023 and 85% of the emissions level of 2019 from 2024 onwards*.

*Adopted at the 41st ICAO Assembly.



Global Framework for Clean Energy, including SAF

At the "Third Meeting on Aviation and Alternative Fuels (CAAF/3)" held in November 2023, discussions were held regarding the promotion of SAF (Sustainable Aviation Fuel) utilization, reaching an agreement on a global framework, including quantitative interim targets.

CAAF/3

The main points of agreement are as follows:.

①Policy and Planning	✓ Compared to using existing jet fuel 100% by 2030, a 5% reduction in CO_2 emissions. ✓ Regularly review progress towards achieving goals, and convene CAAF/4 no later than 2028.
②Regulatory Framework	✓ Increase the number of SCS (Sustainability Certification Scheme) certifications to expedite the authentication process for CORSIA-eligible fuels. ✓ Requirements for SAF (Sustainable Aviation Fuel) accounting systems to monitor the usage of SAF.
③Implementation Support	✓ Proposal of a Policy Toolkit to support policy formulation. ✓ Promotion of effective technology transfer to developing countries.
④Financing	✓ Establishment of the "ICAO Finvest-Hub" to match private financial institutions with funding needs in developing countries. ✓ Consideration by ICAO of establishing a new fund for reporting at the next ICAO Assembly (2025).


The Deputy Director of the Civil Aviation Bureau, Mr. Onuma, who will read our country's statement.

Source: MLIT (Tentative translation by Eco-Mo Foundation)

2 Promotion of emissions gas measures for trucks and busses (diesel vehicles), etc.

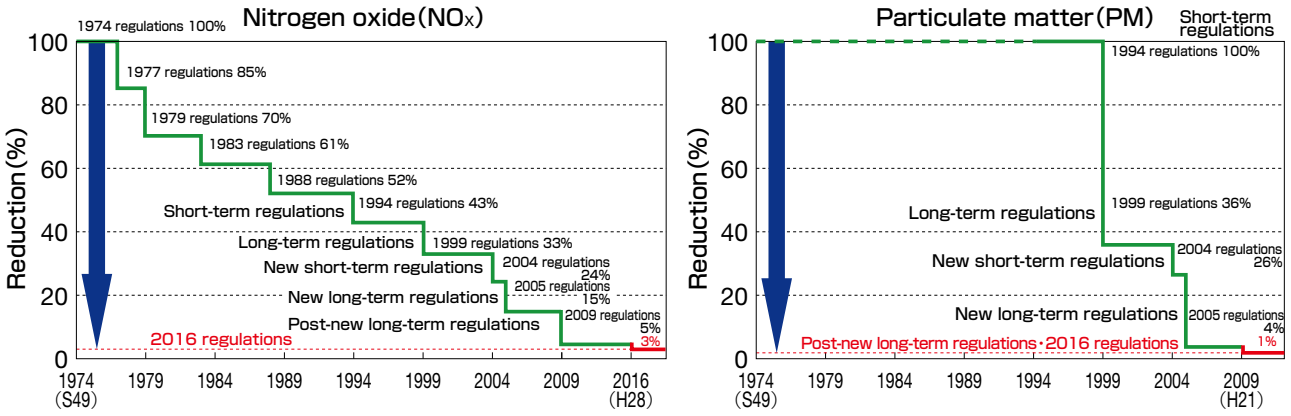
The problem of vehicle exhaust gas became a serious social problem with the rapid urbanization which began in the mid-1960s and the increase in vehicle traffic. For emissions gas measures for diesel vehicles it is especially important to reduce the amount of emissions of nitrogen oxide (NOx), which is a cause of respiratory disorders and causes photochemical smog and acid rain, and particulate matter (PM), which is a carcinogen. In order to do this, the government strengthened exhaust gas regulations by enacting vehicle composition regulations and repeatedly revising road vehicle safety standards. Furthermore, in 1992 the Automobile NOx Reduction Law (now the Automobile NOx/PM Law) was enacted to reduce NOx and PM emissions.

(1) Promotion of emissions gas measures for diesel vehicles

①Restrictions on manufacturers

In 2016 with the introduction of measures such as cold engine exhaust gas testing, the scope of exhaust gas regulations came to include vehicles with actual NOx emissions of about 1/3 of those included in previous regulations. As a result of the regulations, the vehicles will successively be replaced by clean diesel vehicles with dramatically improved exhaust gas performance.

●Vehicle exhaust gas restrictions (diesel-powered heavy vehicles)



Source: MLIT (Tentative translation by Eco-Mo Foundation)

②Restrictions on users

In urban areas where Automobile NOx/PM air quality standards had not met, nitrogen oxide countermeasure areas and particulate matter countermeasure areas were defined and restrictions were placed on vehicle users with the aim of achieving air quality standards in the areas by roughly 2010. Specifically, for areas specified in the regulations, users are prohibited from registering vehicles which do not meet specific exhaust standards (model prohibition) and mandate the submission of exhaust gas regulation plans by specified operators. Tokyo Metropolis, Saitama Prefecture, Chiba Prefecture, Kanagawa Prefecture, Hyogo Prefecture, and Osaka Prefecture have also defined ordinances restricting the inflow of non-compliance vehicles from other regions, for futher reducing nitrogen oxide and particulate matter emissions.

In order to differentiate between vehicles which do and do not meet these standards, complied vehicles are issued with stickers, preventing the inflow of illegal vehicles. Despite the implementation of restrictions affecting users in areas implementing these measures, non-compliance vehicles from other areas pass through intersections with heavy traffic, resulting in areas not meeting air quality standards. In response to this situation, the Automobile NOx/PM Law was partially revised in 2008 to apply to users outside regulation-specified areas as well.

Furthermore, in March 2011 the Automobile NOx/PM Law enforcement and ministerial orders were revised and regulations for users with the aim of achieving air quality standards targets in urban areas by 2020 were set out.

Subsequently, based on the "Future Comprehensive Measures for Automobile Exhaust Emissions" issued in April 2022, the enforcement order of the Automobile NOx and PM Act was amended in November 2022, and the target year for achieving air quality standards in urban areas was changed to FY2026.

	Automobile NOx/PM Law	Tokyo, Saitama, Chiba, and Kanagawa Prefecture Ordinances	Hyogo Prefecture Ordinance	Osaka Prefecture Ordinance
Category	National law	Ordinance	Ordinance	Ordinance
Regulated material	Nitrogen oxide (NOx), particulate matter (PM)	Particulate matter (PM)	Nitrogen oxide (NOx), particulate matter (PM)	Nitrogen oxide (NOx), particulate matter (PM)
Contents of regulation	Prohibits registration of vehicles which do not conform with exhaust standards (vehicles do not pass ongoing vehicle inspections)	Prohibits driving of vehicles which do not conform with exhaust standards	Prohibits driving of vehicles which do not conform with exhaust standards	Prohibits driving of vehicles which do not conform with exhaust standards
Vehicles affected	Vehicles whose use is based in specified measure implementation areas	Diesel vehicles driving in the area covered by the ordinance	Diesel vehicles driving in the area covered by the ordinance	Vehicles which arrive at or depart from the restricted area (does not apply to vehicles passing through the area)
Vehicle models affected	Diesel passenger vehicles, trucks, buses, special purpose vehicles (not including light motor, special vehicles, and passenger vehicles which use gasoline or LPG as fuel)	Diesel vehicles with license plate numbers 1-, 2-, 4-, 6-, or 8- (except for passenger vehicles with 8- license plate numbers)	Vehicles with total weights of 8ton or more which cannot be registered due to their use being based in non-regulated areas specified by the Automobile NOx/PM Law (for buses, buses with capacities of 30 people or more)	All trucks, buses, and special vehicles other than passenger vehicles covered by the Automobile NOx/PM Law

(2) Appropriately maintained vehicle usage and appropriate fuel usage guidance

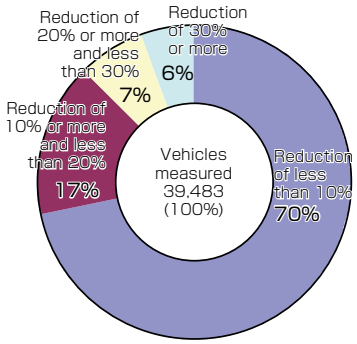
①Appropriately maintained vehicle usage

In order to reduce the environmental impact of vehicles, it is essential that they should be properly maintained and that they consistently maintain exhaust gas performance during operation. Insufficiently maintained vehicles emit greater amounts of NOx and PM than properly maintained vehicles, creating major environmental problems.

A study of reductions in emissions of black smoke after maintenance on diesel vehicles brought in for maintenance found that 30% of all the vehicles examind are found reduced the black smoke concentration 10% or more. This confirmed that inspection and maintenance significantly reduces diesel black smoke emissions.

●Reduction in black smoke emissions as the result of inspection and maintenance / Number of vehicles brought in for maintenance in October 2014
(According to a study by the Japan Automobile Service Promotion Association)

	Vehicles Measured	Percentage
Reduction of less than 10%	27,745	70%
Reduction of 10% or more and less than 20%	6,973	17%
Reduction of 20% or more and less than 30%	2,575	7%
Reduction of 30% or more	2,190	6%
Total	39,483	100%



(Breakdown of reductions in black smoke emissions as the result of inspection and maintenance)

②Appropriate fuel usage guidance

Since FY2005 the MLIT has conducted street inspections to check fuel sulfur content. When incidents of use of illegal diesel fuel with high sulfur content are discovered, warnings or orders to switch to proper fuel are issued, with the goal of eliminating the use of illegal diesel fuel.

<Illegal diesel fuel>

Illegal diesel fuel refers to diesel fuel mixed with kerosene or fuel oil, and to manufactured diesel fuel which has been produced by adding sulfuric acid, etc. to fuel oil. Industrial waste such as sulfate pitch, which is discharged during the production of illegal diesel oil, is mostly disposed of by illegal dumping, creating environmental problems nationwide. Using illegal diesel fuel in diesel vehicles also increases the amount of air pollutants PM and NOx in their exhaust.

●Illegally dumped sulfate pitch which has leaked out of its containers

An illegal diesel fuel which mixes diesel oil and A-type fuel oil equally increases diesel vehicle exhaust gas PM levels by 14 to 17% and NOx levels by 7 to 8% in their exhaust gas.

3 Creation of a recycling-oriented society

(1) Creation of recyclable resource distribution systems

①Formation of a recyclable resource distribution system using sea transport

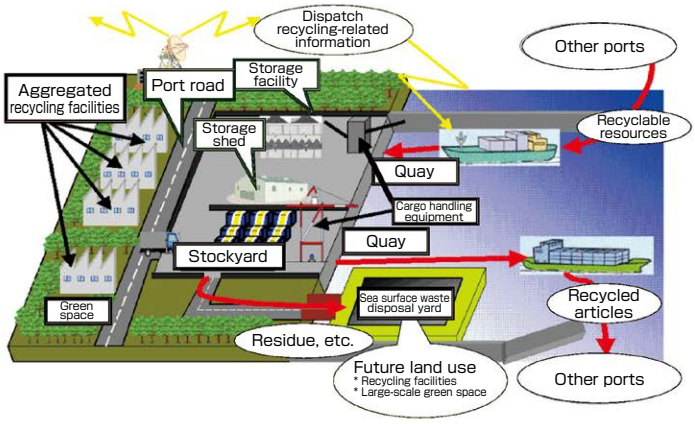
In order to create a recyclable resource cycle as part of the creation of a recycling-oriented society, 22 ports nationwide have been designated as Recycle Ports (integrated venous logistics ports), centers of wide-area circulation of recyclable resources. The MLIT provides the support necessary to improve port facilities such as shipment transfer, storage facilities, and other recyclable resource handling support facilities.

●Outline of the Recycle Port Policy

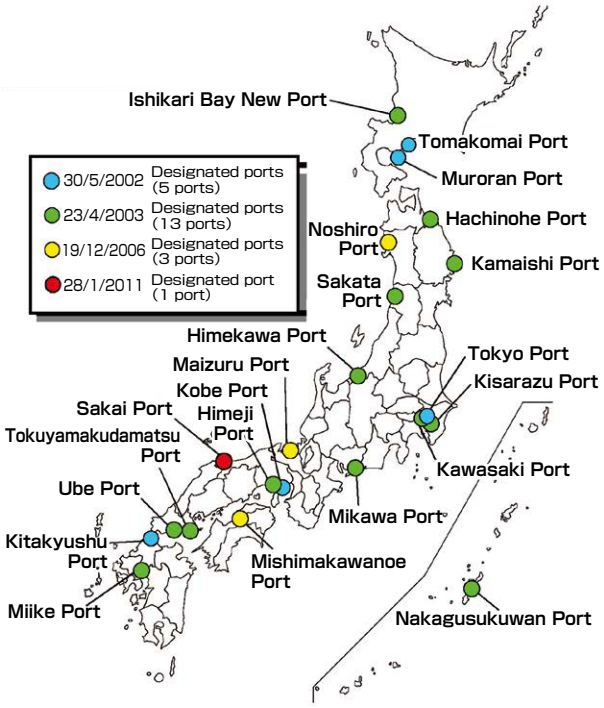
Recycle Port Policy

- Securing port facilities such as quays
- Providing support for the maintenance of shipment transfer and storage facilities, etc. (subsidized with subsidy rate of 1/3)
- Improvement of operations related to recyclable resource handling
- Promotion of coordination between the government and private sector (use of the Recycle Ports Promotion Council, etc.)

Recycle Port Image



Designated Recycle Ports (22 ports)



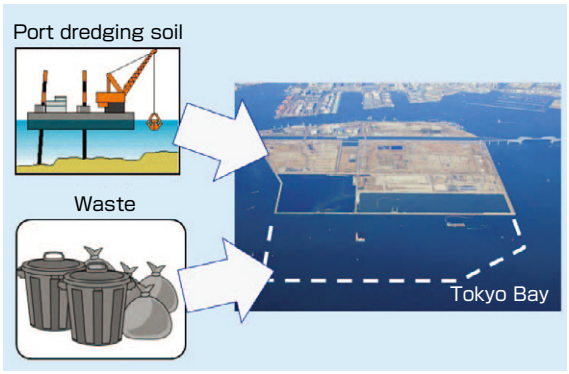
[Expected benefits] Support for the creation of a recycling-oriented society, reduction of environmental impacts, reduction of recycling costs, and vitalization of coastal area industry

Source: MLIT (Tentative translation by Eco-Mo Foundation)

②Systematic securing of sea surface waste disposal yards

In order to dispose of dredge soil from port improvement works and waste which is difficult to handle at the inland final disposal site, a systematic development of sea surface disposal yards is underway. In particular, at Osaka Bay, a wide-area disposal yards based on the Osaka Bay Phoenix Plan is being developed which enables the disposal of waste generated from the Osaka Bay area. In addition, construction-generated soil from the Tokyo Metropolitan Area is transported by sea based on the Super Phoenix Plan and is used on a wide scale as landfill material in ports and harbors nationwide.

●Promotion of planned improvement of sea surface waste disposal yards



Source: MLIT (Tentative translation by Eco-Mo Foundation)

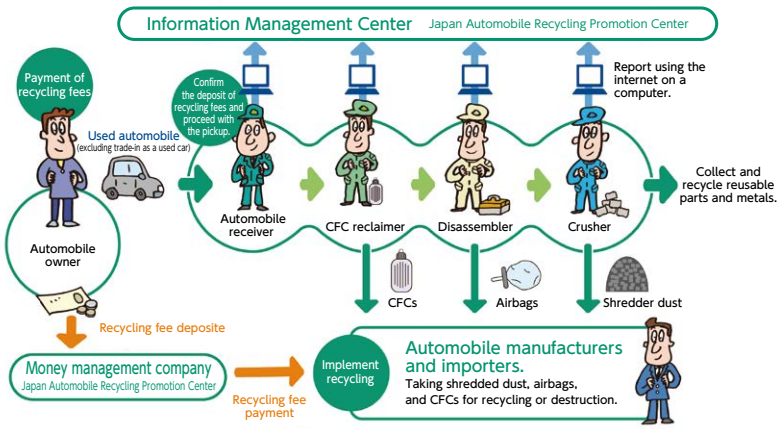
(2) Creation of vehicle recycling system

Every year between 4 and 5 million used vehicles are disposed of. Landfill space is running out, making it urgent to further increase the recycling rate, which is current roughly 80%. As of 2004, over 195,000 automobiles were improperly stored on roads, etc. each year. And over 20,000 automobiles were illegally dumped. These have a negative impact on living environments and the disposal involves tremendous social costs, making it urgent to implement countermeasures.

In response to this situation, the "Act on Recycling, etc. of End-of-Life Vehicles" was enacted in January 2005. This law mandated appropriate divisions of duties between the parties involved in end-of-life vehicle disposal, focusing on automobile manufacturers. At the same time revisions were made to the Road Transport Vehicles Act mandating that vehicle registration be deleted only after confirming that vehicles were disassembled as specified in the Act on Recycling, etc. of End-of-Life Vehicles, and a motor vehicle tonnage tax reimbursement system was instituted for end-of-life vehicles. The aims of these efforts were the promotion of appropriate processing of end-of-life vehicles and the prevention of illegal dumping.

As a result, a significant reduction has been achieved nationwide by the end of FY2022 in the numbers of improperly stored vehicles (4,021 vehicles; 97.9% decrease compared FY2004) and illegally abandoned vehicles (756 vehicles; 96.6% decrease compared to FY2004).

●Act on Recycling of End-of-Life Automobiles



Source: MLIT (Tentative translation by Eco-Mo Foundation)

(3) Ship recycling

Ship dismantling (ship recycling)*1 is carried out primarily in developing countries such as India and Bangladesh, and the problems of occupational accidents and environmental pollution in this work are beginning to be acknowledged. In order to solve these problems on an international level, Japan, as a leading country of maritime trade and shipbuilding capabilities, led work on discussing within the International Maritime Organization (IMO) and drafting a treaty, and the "Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009" (also known as the "Ship Recycling Convention") has been adopted.

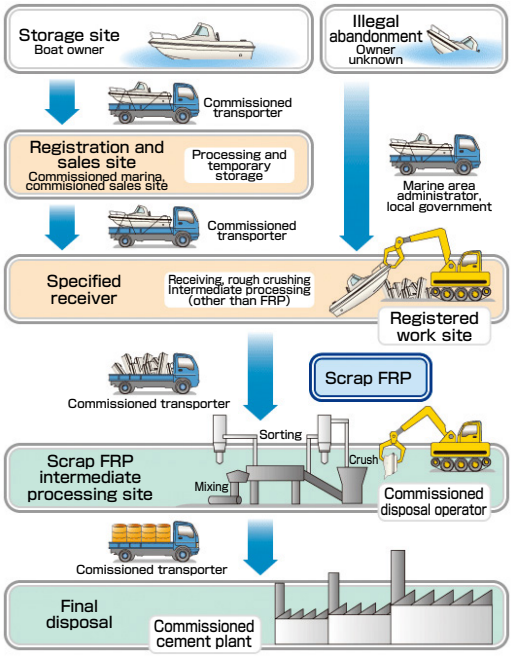
Early enactment of the Ship Recycling Convention not only ensures the safety of ship recycling facility workers and protects the environment but it is also important for the continuous development of the global maritime industry through smooth removal of old vessels from the market.

In March 2019, Japan ratified the Ship Recycling Convention and has been urging other countries to ratify it for its early entry into force. In April 2023, during a summit with Bangladesh, one of the largest ship dismantling countries, the need for early ratification of the convention was confirmed, and a memorandum of cooperation at the vice-ministerial level was signed between the MLIT of Japan and the Ministry of Industry of Bangladesh. Subsequently, with Bangladesh and Liberia ratifying the convention in June 2023, the requirements for its entry into force were met, and as a result, the Ship Recycling Convention will come into effect on June 26, 2025. In response, we are promoting international cooperation to facilitate the smooth implementation of the convention, and domestically, we are advancing preparations for the enforcement of the Act Concerning the Proper Implementation of Recycling and Dismantling of Ships (Ship Recycling Act), which serves as the domestic law for the Ship Recycling Convention.

Meanwhile, as pleasure boat hulls are made of FRP (Fiber Reinforced Plastic), to ensure proper recycling of used FRP vessels, awareness of the "FRP Ship Recycling System" used by the Japan Marine Industry Association (JMIA) has been promoted through information and opinion exchange meetings at the District Transport Bureau, the Regional Development Bureau, and prefectural governments, which are held in each regional block.

*1 Ships which have reached the end of their lifespans are disassembled and the majority of the ships' materials are used for steel.

●FRP boat recycling system



Source: Japan Marine Industry Association FRP Boat Recycling Center
(Tentative translation by Eco-MoFoundation)

4 Measures by local governments, companies, citizens' organizations, etc.

(1) Measures by local governments

Local governments are working on global warming countermeasures in the transport and traffic sectors according to their regional characteristics. Here we introduce the efforts of Utsunomiya City(510,000 inhabitants), Oyama City (170,000 inhabitants), and Shikaoi Town (5,000 inhabitants).

■Utsunomiya City - Building a Compact City Centered Around Public Transport -

In Utsunomiya City, we are working toward realizing a town called "Super Smart City," where everyone can live comfortably, conveniently, and securely and where dreams and hopes can come true. To achieve this, we are advancing the creation of a "Networked Compact City," where a compact city serving as the "foundation" of the town is connected by public transport. Our goal is to transition from a society overly dependent on automobiles to one where public transport and automobiles coexist harmoniously, creating a transport environment centered around public transport that supports various activities in the city, ensures smooth coordination among the various centers, and enables everyone to actively engage in going out and interactions.

● Station East Plaza and the Light Line

● Light Line

To this end, Utsunomiya City has been promoting the introduction of bus routes connecting various locations and intra-regional transportation systems that cover the entire area for daily transportation in order to build a hierarchical public transportation network, and has opened the Haga-Utsunomiya LRT "Light Line" in August 2023, which serves as a next-generation tram, forming a crucial part of the public transport network along with the north–south railway. Moreover, the Light Line operates as "Zero Carbon Transport," running entirely on locally sourced renewable energy obtained from household waste incineration and solar power generation. Alongside initiatives such as introducing electric buses and electrifying local transport, Utsunomiya City is promoting the "decarbonization of public transport," not only enhancing convenience but also prioritizing environmental friendliness.

● Utsunomiya Light & Power Co., Inc.

● "Let's Ride! Navi" search screen

Furthermore, we have established the route search system "Let's Ride! Navi," which not only provides route information but also displays CO_2 emissions and calorie consumption when using public transport, thereby visualizing one's contribution to a decarbonized society and the health benefits that public transport offers to encourage the use of public transport. We are also conducting promotional activities to showcase the attractiveness of public transport.

■Oyama City
-A project on promoting the use of community buses-

The number of bus users in Oyama City, which used to be 13.33 million/year (FY1970) at its peak, dropped to 152,000/year (FY2007), and private bus companies withdrew from the business. Since then, Oyama City has been operating the city's only community bus service, the "O-Bus".

The city launched a project on promoting the use of "O-bus" in FY2018, and since then, it has undertaken a variety of initiatives to promote the use of this service. Below are three distinctive initiatives in this project.

The first was publication of "Bloom!", a lifestyle tabloid that proposes a life with buses. It was distributed three times to a total of 53,000 households in the city. They also included information on places that can be accessed by bus and articles describing how to live more comfortably by using buses for men and women of all ages. As a consequence, the impression of people that "it is lame to take bases" changed, and the number of opportunities for them to use buses increased.

The second, a new paper pass for commuters, "O-Bus noroca," was launched in October 2009. This commuter pass features a user-friendly name ("noro" means both "let's take a bus" and "running slow") and design in addition to a discount of 70% off the original price with unlimited-area ride by making it available for all lines.

In October 2020, a mobile pass for commuters "Smartphone de noroca" was launched, allowing customers to purchase and ride "O-Bus noroca" via a smartphone application LINE. Most recently, in February 2021, they started a LINE coupon service. Furthermore, they have conducted an experimental study on taxi vouchers that the clients can use by presenting "O-Bus noroca" and provided a service that the clients can receive discounts at commercial centers.

Third, they have put efforts into developing new routes, using larger buses, and increasing the number of services; Watarase line was newly introduced in March 2019, and in April 2020, Harvest Walk line was added and the number of services increased for the New Shimin Hospital line. In addition, a larger bus started running for Hanegawa line. In October, 2021, the number of services for Takadake line increased.

As a consequence of the above efforts, the system currently operates buses on 14 routes, covering 5 suburban-demand bus areas. The number of users increased from 367,000, approximately, in 2008 to 737,000 in FY2020, and it is expected to exceed 800,000 in FY2021.

The lifestyle tabloid "Bloom!" distributed to a total of 53,000 households in the city.

70% off the original price with unlimited-area ride
A commuter pass for buses "O-Bus noroca"

From the minimum service to the convenient service
Proactive introduction of new routes and increased operations

Shikaoi Town - EST Project Centered on Hydrogen Derived from Livestock Excreta

Shikaoi Town has been operating a centralized biogas plant since 2007 to address odor control in agriculture and ensure proper treatment of livestock excrement and urine, food waste, and sewage sludge. The plant produces digestate during the treatment process, which is then returned to the fields as environmentally friendly organic fertilizer, realizing a "local resource circulation-oriented agriculture." Additionally, the town has been pioneering efforts in improving transport environment by not only effectively utilizing biogas generated from methane fermentation in power generation and heat but also by operating "biogas vehicles" that utilize biogas methane obtained during the purification process.

Furthermore, since 2015, Shikaoi Town has been establishing a mechanism for stable "production, transport, and usage" of hydrogen by operating FCEVs and FC forklifts, supplying hydrogen to pure hydrogen-type fuel cells, and other measures as an Ministry of the Environment demonstration project. Starting in 2022, the town and private companies have been cooperating to commercialize the hydrogen supply business. Presently, with the cooperation and support of local private businesses (JA, financial institutions, construction, transport, tourism, etc.) and residents, Shikaoi Town has introduced 22 FCEVs, including 10 municipal vehicles, into the municipality. Additionally, in October 2022, the town established the "Carbon-Free Vehicle Introduction and Promotion Subsidy System" targeting used FCEVs and is advancing efforts to address challenges in collaboration with automobile manufacturers to introduce FC buses and FC trucks.

Moreover, by utilizing unused idle land for the "Self-employed Line Microgrid Project," Shikaoi Town operates CEMS to supply surplus solar power to EVs and PHEVs physically. Furthermore, it promotes the use of public bicycles, recommends walking and cycling to work, implements an eco-driving promotion project targeting all households, and conducts detailed environmental education. By taking advanced and comprehensive measures to address transport environment, Shikaoi Town pursues sustainability as the "Japan Geopark - Decarbonization Pioneer Region (selected in the first round)."

● Hokkaido's Only Fixed Hydrogen Station "Shikaoi Hydrogen Farm"

● Microgrid for Private Lines "Shikaoi Private Line Network"

(2) Measures by companies in the transport sector

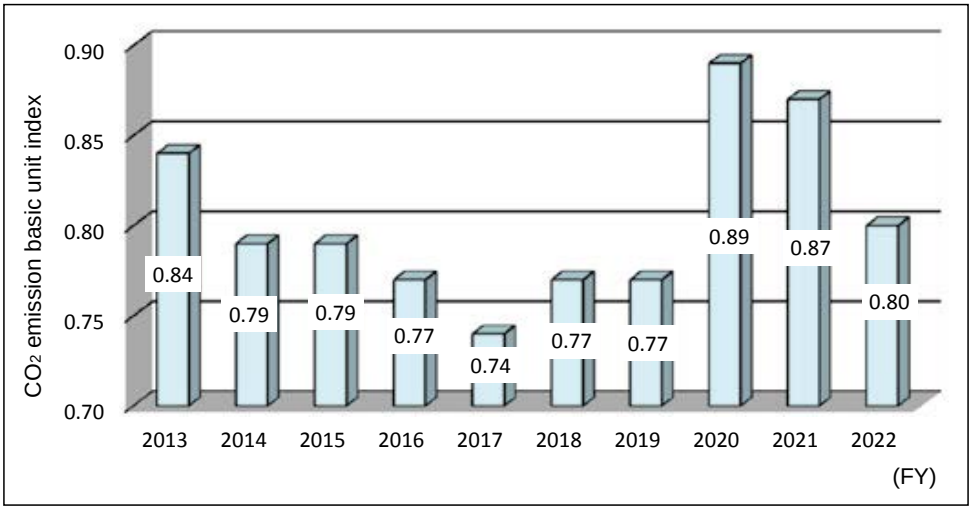
①Aviation companies

The Scheduled Airlines Association of Japan, a Japanese association of air transport operators, has implemented environmental measures. Major measures are the following.

○Global warming prevention targets:

Goal: By FY2030, achieve a CO_2 emission unit of 0.8054 kg-CO_2/RTK (Revenue Ton-Kilometer), representing a reduction of ▲22.2% compared to FY2013 and ▲15.4% compared to FY2019.

Actual Performance: In FY2022, the CO_2 emission unit was 0.9923 kg-CO_2/RTK(Revenue Ton-Kilometer), representing a ▲4.1% reduction compared to FY2013 and a +4.2% increase compared to FY2019.



Contents of major measures:

- Promoting the introduction (and renewal) of fuel-efficient equipment with better fuel efficiency.
- Improving aircraft operation methods through precise navigation and other means.
- Promoting the adoption of SAF and strengthening response to market mechanisms.
- Reducing weight onboard (lightening aircraft components, optimizing fuel load, etc.).
- Reducing the use of auxiliary power units while parked, improving performance through engine cleaning, and enhancing fuel efficiency.

○Support for the creation of a recycling-oriented society

Goal: Achieve a final disposal rate for industrial waste of 2.4% or less by the FY2025.

Actual performance: The final disposal rate for industrial waste in the FY2022 was 10.4%.

Contents of major measures:

- Promotion of sorting and collection for recycling, as well as encouraging reuse and repurposing.
- Reduction of plastic products and transition to environmentally friendly materials.

○Environmental awareness raising activities

- Strengthening the publication and dissemination of initiatives related to decarbonization and sustainability by member companies on the Association's dedicated sustainability website.
- Introduction of efforts toward climate change mitigation and achieving SDGs goals at the "Environmental Plaza Hokkaido 2023" (commemorative event for the G7 Sapporo Ministerial Meeting on Climate, Energy, and Environment) and similar initiatives.

②Railway companies

The Japan Private Railway Association, which is a group of railway operators has been involved in the "Carbon Neutral Action Plan" formulated by the Japan Business Federation to realize a carbon neutral society in the future, and the following efforts are being made mainly to achieve FY2030 target.

Target: 46% reduction in CO_2 emissions related to operational electricity for all major businesses in FY2030 compared to FY2013

Contents of major measures:

○Introduction of energy saving railcars

Energy-saving railcars are being introduced by equipping them with VVVF inverter control and regenerative brakes for more efficient use of electric power and by reducing the weight of the car body.

●Rates of introduction of energy saving railcars by 16 major private rail companies (as of March 31, 2023)

	Control method	Number of cars owned	
			Number of reduced weight cars
Cars with regenerative brakes	VVVF control	13,152 cars*	11,950 cars
	Chopper control	1,421 cars*	649 cars
	Resistance control, other	640 cars*	185 cars
Cars without regenerative brakes	Resistance control, other	1,884 cars	200 cars*
Total number of cars owned		17,097 cars (A)	12,984 cars
Number of energy saving railcars (cars with regenerative brakes or reduced weight cars)		15,413 cars (B) (total of *)	
Share of energy saving railcars		90.2% (B/A)	

Note 1: As a general rule only commercially used cars are included (funicular lines and new transport lines are not included)

Note 2: Reduced weight cars are cars made with stainless steel or aluminum.

Source: The Japan Private Railway Association (Tentative translation by Eco-Mo Foundation)

○Effective use of renewable energy

Operation of trains with less CO_2 emission by using electricity from renewable energies that utilize Non-Fossil Fuel Certificate, etc., as well as regenerative electric power generated as an excess when the brake is used.

○Optimization of vehicle operations

Measures are being taken to optimize train schedules and train operations through energy-saving operations by reducing train acceleration times, and by decentralizing demand.

③Truck, bus, and taxi companies

Each industry associations have formulated voluntary action plans as environmental measures, striving to popularize green management certification and promote eco-driving, etc.

■Japan Trucking Association

The Japan Trucking Association participates in the Japan Business Federation's "Carbon Neutral Action Plan (formerly the Low Carbon Society Action Plan)". They have set a goal of reducing commercial trucks' CO_2 emissions per ton-kilometer transport in FY2030 by 31% compared to FY2005 in terms of CO_2 emissions per unit of transport, and the entire industry is working on various measures to achieve this goal.

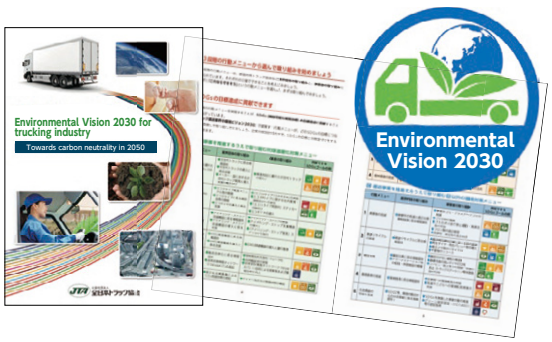
【Contents of major measures】

◆Developing a new action plan for the trucking industry as a whole

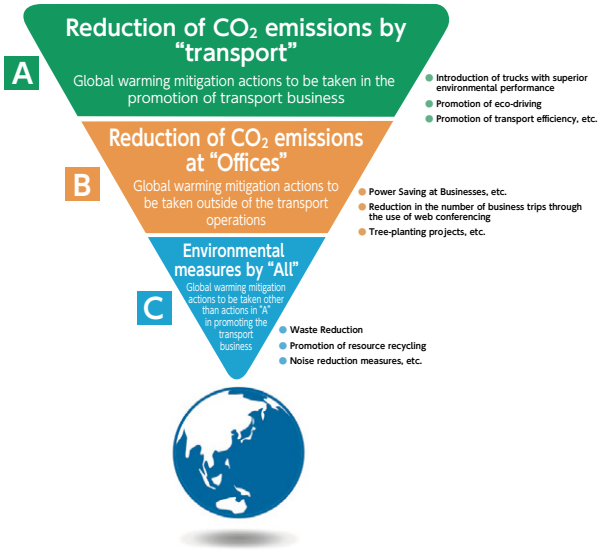
・The importance and urgency of measures to combat global warming are increasing due to the frequent occurrence of disasters around the world that are believed to be caused by climate change, and the trucking industry is required to be more proactive in its efforts to combat global warming. Thus, the "Environmental Vision 2030 for the Trucking Industry - Toward Carbon Neutrality in 2050" was formulated in March 2022 as an action plan to be undertaken by the Japan Trucking Association, prefectural trucking associations, and businesses as a whole. Efforts are progressing.

Environmental Vision 2030 for the Trucking Industry" formulated in March 2022.

Brochure and Symbols



A "three-step actions" to be undertaken by carriers



Main goal and three sub-goals

Main Target

Reduce CO_2 emission intensity of the trucking industry as a whole by 31% in 2030 compared to FY2005 levels

Sub-targets

(1) For vehicles with a gross vehicle weight of 8 tons or less, the number of electric vehicles in the fleet in 2030 shall be 10%.
(2) Aim for each business to understand the total CO_2 emissions or CO_2 emissions intensity of its own fleet
(3) Establish an "Action Month" to be shared by all Japan Trucking Associations and all Prefectural Trucking Associations.

◆Spread of trucks with great environmental performance and equipment that greatly improves fuel efficiency

・To further promote the spread of environmentally friendly vehicles, such as natural gas trucks which are a promising alternative to petroleum in terms of energy security, hybrid trucks with excellent fuel efficiency, and electric trucks that do not emit CO_2 when they run, a portion of the price difference between the regular vehicle and these vehicles is subsidized.

・Provide subsidies for air heaters and truck battery driven coolers which can be used when engines are stopped during truck driver breaks, when waiting for cargo to be loaded, etc.

・Make environment-compatible trucks and energy-saving equipment eligible for modernization fund financing and subsidize high rates of interest compared to ordinary investment.

Eligibility for various subsidies


Electric truck


Large LNG truck


On-board battery-operated cooler

Environmentally-friendly vehicles

Idling-stop support apparatus


Small CNG truck


Small hybrid truck


Large CNG truck


Air heater

◆Support for improvement of awareness about environmental measures and energy-saving

・Distribute manuals to promote eco-driving and provide support for operator and driver initiatives.

・Participate in "the Eco-Drive Activity Contest" held by the Eco-Mo Foundation and promote the acquisition of Green Management certification.

◆Project to create "Truck Woods"

・With the aim of preventing global warming through cultivating trees, the association has been promoting its project to created "Truck Woods" since FY2003. Around one hectare of national forest field has been set aside as " Truck Woods" and the association planted trees in Baratogawa Green Land in Sapporo City in FY2023 in a project to contribute society in which the association is involved in various activities in cooperation with local volunteers to protect the forests.

・In addition, the association is promoting projects to create independent "Truck Woods" in prefectural trucking associations and to spread this initiative nationwide.

〈FY2023 Project to create "Truck Woods" (Baratogawa Green Land, Kita-ku, Sapporo City)〉

■Business Initiatives: Yoko Co.

Environmental Management: A Status Linked to Trust

As a group company of Uchida Yoko Co., Ltd., a leading office product retailer, our company is responsible for delivering and installing office furniture such as desks and lockers in western Japan. With our management philosophy of "contributing to the development of society through safe and trusted logistics services," we strive to enhance customer satisfaction by providing services that prioritize safety and reliability, while also dedicating efforts to environmental and safety initiatives, especially eco-driving.

○Obtaining certification aligned with the importance of environmental management.

Our company was established in 1950 and operates in western Japan, including the Kinki region, Chukyo region, Hokuriku, Kyushu, and Okinawa. In addition to approximately 40 in-house vehicles comprising 2-ton and 4-ton trucks, we collaborate with multiple transport companies to handle the delivery and installation of office furniture and supplies. Our primary tasks also include relocation services and temporary construction work associated with setting up or moving corporate offices.

"The Green Management Certification" has been awarded with perpetual registration recognition.

We have been promoting environmentally conscious management practices, such as collecting cardboard and polystyrene generated during unpacking at delivery destinations to minimize waste production. Recognizing the increasing importance of environmental management for the sustainability of our business, we decided to obtain "Green Management Certification" to make our company's environmental management stance clear. Initially, the Chubu and Fukuoka branches acquired certification in 2008, followed by the Osaka branch in 2013.

To facilitate environmental management activities, we have appointed "Environmental Management Officers," "Environmental Conservation Promotion Officers," and "Eco-Driving Promotion Officers" in each business unit to provide guidance and education to employees. Previously, environmental activities varied between business units, but by aligning efforts, we have developed efficient and effective activities and unified the promotion structure and initiatives across all business units in conjunction with obtaining the "Green Management Certification."

○Promoting eco-driving during monthly safety meetings.

In the practice of environmental management, eco-driving is particularly crucial. Each division holds quarterly "safety meetings" where all drivers are gathered to promote safe driving practices and ensure thorough awareness of eco-driving. Additionally, each division holds departmental policy announcement meetings biannually, including environmental management, to report on and share the progress of activities, and issue detailed instructions, emphasizing the importance of information sharing.

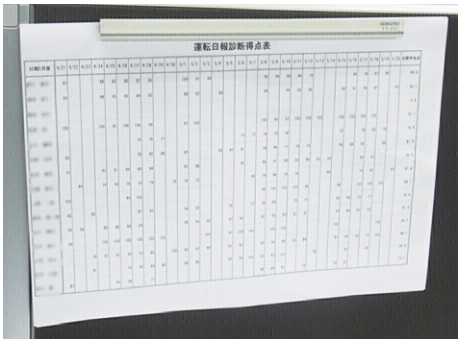

The eco-driving is promoted during the quarterly "Safety Meetings."

Regarding driver education, we invite instructors from dealerships and industry associations every six months to conduct safe driving seminars at each site, including education on eco-driving. Through lectures and practical exercises, drivers experience the effects and methods of eco-driving, raising awareness of the importance of environmentally friendly driving. Although these seminars were postponed due to the pandemic in recent years, we aim to resume them as soon as possible, while taking the current social situation into account.

Preventing driving behaviors that have negative environmental and safety impacts, such as abrupt starts and accelerations, is essential. We also enforce our drives to stop idling. Given that our operations sometimes require extended work at delivery points, we ensure that our drivers minimize their engine usage while parking or moving their vehicles, even during brief moments of downtime, so as to reduce environmental impact.

○Ensuring accident-free operations through safety education and maintenance inspection seminars.

We use digital tachographs for monitoring the progress of eco-driving, having completed the introduction of these devices to all vehicles before obtaining "Green Management Certification." The operation manager regularly checks the scores recorded by the digital tachographs to ensure that eco-driving practices are being properly implemented and also utilizes them to encourage safe driving practices. To help drivers understand the quality of their driving compared to others, we display drivers' scores internally each month, aiming to raise awareness of environmental and safe driving practices.



Driver performance is displayed to reinforce awareness of safe driving practices.

To further strengthen safety measures, we conduct maintenance and inspection seminars for each site during the quarterly "safety meetings." We emphasize repeatedly on the importance of performing proper maintenance and inspections every day, communicating that it contributes to personal safety.

Additionally, the effectiveness of these initiatives is reflected in fuel efficiency, which has improved from 7.0 km/l at the time of obtaining "Green Management Certification" to current 8.5 km/l. Most drivers now maintain high standards, and we can witness the results of continuous education.

Considering how our daily operations contribute to reducing environmental burdens, ensuring driver safety, and ultimately realizing the Sustainable Development Goals (SDGs), we continue to advance education. In raising awareness of safe and environmentally friendly driving, it is crucial to provide practical advice tailored to each driver and offer education with a sense of urgency.

The outcome of such education is evident as we have experienced no driving accidents, including minor incidents, over the past five years. To maintain this accident-free record, we constantly experiment with various educational methods to enhance driver awareness and effectiveness while aiming to establish a high-level educational framework.

○We are focusing on reducing CO_2 emissions through the introduction of environmentally friendly vehicles and solar panels.

In terms of facility investment, we actively adopted low-emission vehicles such as "low-fuel consumption and low-emission certified vehicles (NOx·PM-compliant vehicles)" at all our locations, even before obtaining "Green Management Certification." We also focus on reducing direct CO_2 emissions by using battery-powered forklifts for all warehouse operations.

Low-emission vehicles are used for our trucks.

At our Osaka Logistics Center and Oguchi Logistics Center, we have installed solar panels during the facility construction to promote the production of renewable energy. A portion of the generated electricity is used for our own consumption, thereby promoting energy conservation. Furthermore, we are gradually transitioning office and warehouse lighting to LED, with the entire lighting system at the Osaka Logistics Center scheduled to switch to LED by the end of August. As part of our further energy-saving measures, we plan to install motion sensors for lighting in areas such as office staircases and corridors where employees are not always present, aiming to further limit electricity consumption.

Utilization of solar power generation contributes to energy conservation.

Additionally, we strive to foster environmental awareness by

sharing articles such as "Green Management News" and displaying examples of other companies' initiatives in our facilities for wider information sharing.

○"The Green Management Certification" brings positive impacts to our management.

From left to right: Division Manager Mr. Maruo, Chief and Operations Manager Mr. Miyano.

Obtaining "The Green Management Certification" has led to receiving high praise from customers, with feedback such as "we can trust you with work with peace of mind," and has generated positive outcomes such as an increase in cooperative transport companies. As "how environmentally conscious our management is" becomes a crucial status for the company's "trust," we aim to continue our environmental management and safe driving efforts to further gain trust from our customers.

Regarding the certification renewal, the process has been streamlined and simplified compared to before, with the ability to complete document applications online, which is greatly appreciated as a certified business. Looking ahead, we anticipate that the importance of "The Green Management Certification" will be further recognized, potentially leading to more practical benefits associated with local government support for environmental management.

Company Overview:
Location: 17th floor, Nakanoshima Intes, 6-2-40 Nakanoshima, Kita-ku, Osaka City, Osaka Prefecture
Representative Director: Hiroto Takano
Established: 1950
Capital: 11 million yen
Fleet: 40 vehicles
Employees: 158
Green Management Certification Registration: December 2008 (Chubu Branch, Fukuoka Branch), Osaka Branch, among others

■Nihon Bus Association

- Bus business "Low Carbon Society Implementation Action Plan" -

Target:

○Cut CO_2 emission intensity in FY2030 by 6% in comparison to FY2015.

○Promote shift from use of private cars to buses.

Specific activity contents:

○CO_2 emission rates reduction measures

・Nationwide promotion of eco-driving

Member companies are striving to ensure drivers thoroughly engage in eco-driving, such as by stopping their engines when idle, and avoiding quick acceleration and quick braking. During Eco-Driving Promotion Month, of which the Nihon Bus Association is a leading advocate, the association takes even more intensive measures, such as carrying out checks of eco-driving implementation.

For buses, make efforts to proactively introduce equipment such as idling-stop vehicles and digital operation recorders that are effective in reducing CO_2 emissions.

・Promotion of introduction of high fuel efficiency buses

Toward Carbon Neutral 2050, utilize subsidy programs provided by the national government, local governments, and the Nihon Bus Association to actively promote the introduction of electric vehicles (EV buses, FCV buses, hybrid buses) and fuel-efficient vehicles, etc.

・Enforcement of detailed inspections and maintenance which help maintain fuel efficiency performance

○Measures for promoting shifting from use of private cars to buses

・Bus usage promotion

The association is implementing the following measures in order to improve omnibus convenience and promote bus usage.

◇Popularization of non-step buses and pleasant, comfortable buses

◇Promotion of installation and improvement of shared card systems and IC card systems

◇Popularization of information systems such as bus location systems

◇Active participation in regional measures such as Park & Bus Ride and omnibus town systems

◇Promote introduction of community buses

・Driving environment improvement

◇Issuing of requests to related organizations whenever possible regarding the creation of bus-only lanes and bus-priority lanes, bus-prioritizing traffic signals, the removal of illegally parked vehicles on streets used by buses, etc.

■Japan Federation of Hire-Taxi Association

- Hire-taxi industry's a Low Carbon Society Implementation Action Plan (voluntary action plan) -

Target level:

○FY2020 target (total volume of emissions target)

Reduce CO_2 emissions by 20% in comparison to FY2010.

○FY2030 target (total volume of emissions target)

Reduce CO_2 emissions by 25% in comparison to FY2010.

Basis used to establish targets:

○FY2020 target

30% of taxis will consist of HVs, EVs, or other environmentally friendly vehicles. CO_2 emissions will be reduced by reducing fuel consumption through demand and supply optimization.

○FY2030 target

40% of taxis will consist of HVs, EVs, or other environmentally friendly vehicles. CO_2 emissions will be reduced by reducing fuel consumption through demand and supply optimization.

Specific plans:

○Global warming countermeasures

In order to achieve hire-taxi industry target levels, the following countermeasures will be promoted and the federation will coordinate and collaborate with national and local governments as necessary.

・Switchover to environmentally friendly taxi vehicles

◇By FY2020 30%,by FY2030 40% of taxis will consist of HVs, EVs, or other environmentally friendly vehicles, and the association will encourage automobile manufacturers to speedily launch HV vehicles which use LP gas.

・Optimization of the number of taxi vehicles

◇Based on the “Act on Special Measures Concerning the Rectification and Vitalization of the General Passenger Vehicle Transport Business in Specific Areas”, revised in November 2013, the Association is promoting the elimination and suspension of vehicles in order to eliminate excess supply.

・Taxi usage promotion

◇Promotion of universal driver training and cultivating high quality drivers.

◇Improve of user convenience and promotion of taxi usage by improving taxi stands and promotion of the deployment of advanced technologies such as smartphone-based technologies.

◇Expansion of shared taxi use and reduction of the amount of private car usage.

・Enrichment of and PR for sightseeing taxis

◇Enrichment and engagement of PR for sightseeing taxis in order to reduce the usage of private cars on freeways and at destinations, cut exhaust gas emissions, mitigate traffic congestion and parking space shortages, and reduce the number of traffic accidents.

◇Multilingual audio translation system and foreign language sheets which can be used by pointing at phrases are being prepared and supplied in order to enable taxi drivers to accommodate foreign travellers.

・Improvement of operation efficiency

◇Promotion of the use of GPS-AVM-based taxi assignment systems and advanced technologies such as smartphone-based technologies in order to improve operation efficiency and reduce exhaust gas emissions.

◇Requests to related organizations to establish and improve taxi pools in order to reduce the amount of unoccupied taxi operation.

・Implementation of eco-driving, and etc.

◇Ensuring thorough stopping of engines when vehicles are stopped, prevention of excess vehicle cooling and heating, and prevention of quick acceleration and braking.

◇Engines are to be stopped when drivers are taking rests, naps, and washing vehicles.

◇Green management is being promoted through measures such as expanding the number of operators with green management certification.

◇Promotion of the stopping of engines when vehicles are stopped and the deployment of EMS (digital tachographs) in order to support eco-driving.

・Office and business site measures

◇Air conditioner thermostats in offices and business site are set to 28 degrees or higher during the summer and 20 degrees or lower during the winter.

◇Training regarding environmental measures and fuel efficiency improvements are provided to mechanics and drivers through maintenance managers and driving managers.

・Improvement of environmental issue related implementation systems

◇Environmental measure related policies such as carbon offset policies are considered by committees such as technical and environmental committees.

・PR regarding global warming countermeasures

◇Encouraged use of websites, posters, stickers applied to taxis, and other means to publicize the taxi industry's efforts to reduce CO_2 emissions and increase awareness among the general public regarding the prevention of global warming.

○Creation of a recycling-oriented economic society

Disposable economic society will be reevaluated from the position of effective resource utilization, and hire-taxi operators will do their utmost to achieve the following, in order to systematically reduce waste production, and to recycle resources.

・ELVs (End-of-Life Vehicles) will be processed appropriately in accordance with the Act on Recycling, etc. of End-of-Life Vehicles.

・End-of-life tires, etc. will be appropriately processed as industrial waste.

・Recycling will be promoted through measures such as the proactive purchasing of recycled products.

④Warehouse companies

The Japan Association of Refrigerated Warehouses is continuing its efforts to reduce "CO_2 emissions and energy usage" through measures such as: ① Promote the introduction of energy-saving equipment that does not use CFCs by actively utilizing the project for promoting the de-CFC and decarbonization of refrigeration equipment that supports the cold chain (one-third of the project cost subsidy, etc.) ② Carrying out "Energy usage fact-finding studies" and "Coolant studies" to collect basic data related to CO_2 emissions reductions ③ Hold "Training Course for Experts in Handling Refrigerants and CFCs" to develop human resources with knowledge for proper management of CFCs, and ④ Promoting the acquisition of Green Management certifications (subsidizing part of the cost of acquiring new Green Management certifications).

(3) Measures by citizens' organizations

The expansion of lifestyles which are dependent on the use of private cars has resulted in chronic traffic congestion and the waning of public transport. In order to create a shift from the use of private cars to public transport, Car-free Day are taking place.

Every year cities around the world take part in Mobility Week & Car-free Day (September 16 to September 22), initiatives in which residents refrain from using their own personal vehicles in central city areas and consider the issues of traffic and its effects on the environment, and urban life and how to best use vehicles. This transport policy and event, which started in Europe, have now become a global environmental and transport event with about 3,000 cities around the world, linked by a common objective and working at the same time. In 2023, the event was held in seven locations in Japan (Zushi City*; Kanazawa City; Fukui City*; Toyohashi City; Hino-machi, Shiga; Osaka City*; and Fukuyama City*).

＊Citizen group-sponsored; Those unmarked are local government-sponsored. Secretariat : (GIA) Car Free Day Japan

In addition, the "Kumamoto Prefecture All Citizen Stop Warming Movement Meeting" is a prefectural citizen's movement started in August 2008 for reviewing lifestyles and corporate activities so that each citizen can completely eliminate the waste of energy and the efforts to reduce greenhouse gases can be progressed further. Based on the fact that automobiles are the main means of transport in areas outside the central zone of Kumamoto Prefecture, the concept of eco-driving was put in the spotlight.

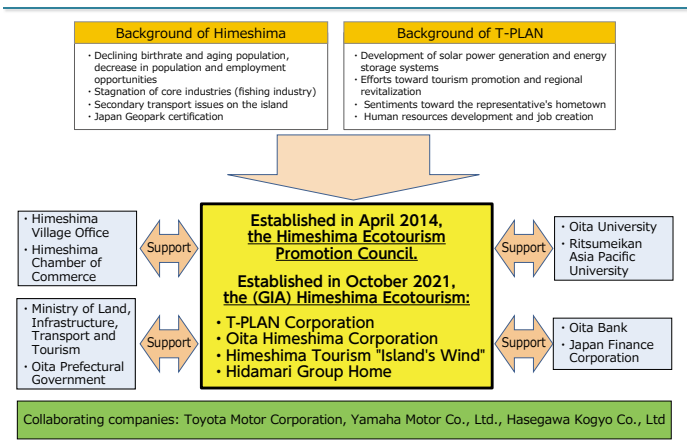
Specifically, eco-driving diagnoses via safe driving eco-driving support systems that use GPS receivers are being actively promoted in collaboration with Kumamoto Prefecture. These are devices for managing drivers, rather than just cars, and diagnoses are possible even if the vehicle driven is different - if it is for example a company car or a private vehicle. Offices purchase the devices and lend them out to participants to conduct eco-driving diagnosis relays with all citizens.

Additionally, (GIA) Himeshima Ecotourism, located in Himeshima Village in Seto Inland Sea, which is in the eastern part of Oita Prefecture, offers rental cars for tourists, including green slow mobility options, as part of decarbonized tourism mobility. Established in April 2014, the Himeshima Ecotourism Promotion Council (the predecessor of the current nonprofit organization) aims to promote regional development through tourism utilizing electric mobility while protecting the abundant natural environment of Himeshima. Their activities began with the provision of secondary transport for tourists on the island to alleviate inconvenience and create new attractions for tourism through the use of electric mobility.

Starting in 2018, they introduced solar power generation and storage system called the "Blue Sky Outlet," initiating efforts to use only renewable energy for the electric power that drives rental cars. This initiative, named the "Himeshima Model," aims to advance as a model for utilizing energy and mobility for the future, with the goal of expanding to remote islands and mountainous areas facing similar challenges.

●"The Blue Sky Outlet" and electric mobility

(GIA) Himeshima Ecotourism



Column

Nationwide Bus Map Summit (Bus map creation initiative by citizens)

The Nationwide Bus Map Summit is held once a year by the Nationwide Bus Map Summit Planning Committee, which is composed of citizens' organizations and other bus map creating organizations. Approximately 100 people from across Japan participate.

In February 2024, the summit was held in Edogawa, Tokyo. Furthermore, in the weekly Zoom meetings, discussions range from publishing bus map guidebooks and opening up traffic information to debating the funding structure supporting urban transport systems.

●List of citizen's organizations in the Nationwide Bus Map Summit Planning Commitee

Region	Name	Bus Map, etc.
Sapporo	Yourun NPO Inc.	Sapporo Super Convenient Bus Map Hakodate Super Cool Bus Map Iwamizawa Super Rice Bus Map
Hirosaki	H・O・T Managers	"Hotto" informational magazine
Sendai	Community Development Policy Forum	100 Yen Pakku Map
Tokyo (Metropolitan Area)	YUKAI 3-chome RACUMobi	Bus Service Map
Niigata	Niigata Environment and Transport Research Society	Niigata City Transport Map
Fukui	ROBA (Fukui Tram and Machizukuri Association NPO Inc.)	Fukui Norinori Map BUS-DENSYA-NET FUKUI
3 Tokai Prefectures (Aichi, Gifu, Mie)	Public Transport Machizukuri Promotion Network	Rosenzu.com Gifu City Bus Map, etc.
Matsue	Project UI NPO Inc.	Docodemo Bus Net Docodemo Bus Book Docodemo Bus Map Sugoroku
Okayama	Rail transport system Amenity Community Design Association (RACDA) NPO Inc.	Bokke Convenient Bus Map Bisan Seto Access Map
Hiroshima	Hiroshima BRT Research Society	Bus Supermap
Okinawa	Bus Map Okinawa	Bus Map Okinawa

Source: The Nationwide Bus Map Summit website (Tentative translation by Eco-Mo Foundation)

●Bus maps example

Docodemo Bus Book

Fukui Norinori Map

Source: NPO Project YUAI, ROBA (NPO Fukui Streetcar and Town Development Association)

(4) Measures by the Eco-Mo Foundation

①Implementation of the transport business Green Management (low environmental impact business management) Certification System

The Green Management Certification System, which objectively certifies the efforts of companies to make environmental improvements, strives to encourage companies to engage in environmental efforts, and contributes to reductions in the environmental impact of industry by fostering understanding and cooperation of certified companies, among society, or users. The system, with the Eco-Mo Foundation as its certifying body, certifies and register transport operators whose environmental activities meet or exceed levels defined in the Green Management Promotion Manual*. The system was launched for the truck industry in October 2003, for the bus and taxi industry in April 2004, and for the passenger ship, coastal shipping, port transport, and warehouse companies in July 2005. By the end of 2023, the number of certified and registered operators reached 3,133 at 6,203 business sites. The Eco-Mo Foundation announces these operators as "environmentally friendly transport operators" on its website, and also makes a monthly press release on the new registrations to newspapers. In addition, the number of vehicles owned by certified and registered operators of trucks, buses and cabs accounts for 10.2% to 14.7% of the total number of vehicles owned by operators nationwide in Japan.

※The Green Management Promotion Manual contains specific measures for individual environmental conservation items, based on the concepts of ISO14031 (an international standard for environmental performance evaluation). They make it easy to establish targets and carry out evaluations, which in turn make it easy to implement environmental management on an ongoing basis.

●Number of vehicles owned

	Certified Companies as of December 31, 2023	Vehicles owned by all companies	Percentage Owned by Certified Companies	Notes
Trucks	135,808	1,326,167 (Note 1)	10.2%	(Note 1): The number of vehicles owned as of the end of March 2022. Source: "The number of vehicles owned based on data from the Ministry of Land, Infrastructure, Transport and Tourism's Motor Vehicle Bureau" (published by the Automobile Inspection and Registration Information Association). Figures include the number of trucks for business use (excluding trailers) and special purpose vehicles for business use, and do not include the number of registered light freight vehicles.
Buses	13,004	107,626 (Note 2)	12.1%	(Note 2): The number of vehicles owned as of the end of March 2022. Source: "The number of vehicles owned based on data from the Ministry of Land, Infrastructure, Transport and Tourism's Motor Vehicle Bureau" (published by the Automobile Inspection and Registration Information Association).
Taxis	25,810	175,425 (Note 3)	14.7%	(Note 3): The number of corporate taxi vehicles as of the end of March 2022, excluding vehicles dedicated to welfare transport. Source: "Taxi Today in Japan 2023" (published by the Japan Federation of Hire-Taxi Associations).

■The effects of obtaining the Green Management Certification (2021 Edition)

To quantitatively evaluate the effectiveness of reducing environmental burdens through the Green Management Certification system, a study was conducted to examine specific effects resulting from certification acquisition. It was found that not only fuel efficiency improvements were observed after certification acquisition but also secondary effects such as reduction in the number of traffic accidents and an improvement in workplace morale were identified.

○Improvement in fuel efficiency and reduction in the number of traffic accidents and vehicle breakdowns among truck, bus, and taxi operators

Two years after obtaining the certification, the average fuel efficiency of truck, bus, and taxi operators showed improvements compared to that at the time of certification. For trucks with a total vehicle weight of over 8 tons, there was a 3.1% improvement, and for those under 8 tons, a 3.2% improvement. Buses showed a 2.4% improvement, whereas taxis showed a 1.6% increase. Furthermore, in the first year after certification, the number of traffic accidents per distance traveled decreased by 25.9% for trucks, 20.4% for buses, and 7.0% for taxis compared to the previous year. Additionally, the number of vehicle breakdowns per distance traveled decreased by 20.9% for trucks, 3.9% for buses, and 15.9% for taxis compared to the previous year.

○Improvement in CO_2 emissions from warehouse, port transport, passenger ships, and inland shipping operators

In warehouse and port transport businesses, the CO_2 emission intensity improved by 3.6% for regular warehouses and 3.4% for refrigerated warehouses after two years of certification. For port transport, there was a 5.9% improvement per ton handled and a 11.0% improvement per container handled.

For passenger ships and inland shipping operators, the CO_2 emission intensity improved by 3.3% for passenger ships, 4.4% for inland shipping, and 1.3% for tugboats after two years of certification.

○Other secondary effects

Furthermore, it was found that certified businesses experienced various benefits such as "improvement in workplace morale and motivation," "enhanced customer feedback," "reduction in traffic accidents," and "development of leadership talent."

■Evaluations of Green Management Certification

The results of various green management efforts have been tested and verified, and this certification system has come to be evaluated highly, even being included as an element in government measures.

○Freight owner considerations required by notices based on the Energy Saving Act

One of the energy saving measures required of freight owners under the Energy Saving Act (enacted in December 2018) is the "selection of environmentally-friendly freight carriers (carriers who have obtained ISO14001 or green management certifications)".

○Addition of transport and delivery, chartered buses, and taxis to the procurement items specified in the Act on Promoting Green Purchasing

The FY2007 basic policy on the Act on Promoting Green Purchasing (Act on Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities) was approved by the Cabinet on February 2, 2007. It added【transport and delivery】※ to the list of specified procurement items. The FY2008 basic policy was approved by the Cabinet on February 5, 2008, and added【chartered buses and taxis】to the list. The decision criteria are the "neutral evaluation by a third party" of measures such as "implementing measures for promoting eco-driving". In general, this corresponds with green management certified companies.

※Transport and delivery operations within green procurement scope: Domestic correspondence, parcel delivery, parcel post, mail express

○Expressly written in the "Guidelines for the Selection and Use of Chartered Buses in Order to Ensure Transport Safety"

【Published: June 29, 2012】

The MLIT has formulated and issued guidelines which clearly explain the key points involved when travel companies, local governments, educational institutions, etc. select and use chartered bus operators.

These guidelines clearly specify "green management certification" as one of the "evaluation items and evaluation elements involved in comprehensive evaluation" indicated in the guidelines' "key points regarding the selection of chartered bus operators" and "key points regarding bidding, etc., for chartered bus procurement".

○Expressly written in the "Community Bus Deployment Guidelines" as specified in the notice regarding the revision of the Road Transport Act

【Notice: MLIT Notice 633, April 10, 2013 "Concerning the Approach of the MLIT to Local Public Transport Councils"】

The notice clearly states that the perspective of "environmentally consciousness" is to be included by cities, towns, or villages, etc. when selecting community bus operators, and specifies "acquisition of Eco-Mo Foundation Green Management Certification or ISO14001 certification" as a means of evaluating this environmental consciousness.

○Relaxation requirements for Superior Hybrid Vehicles and CNG Vehicles deployment subsidy systems

In order to promote the greater use of low-emission vehicles, the MLIT provides systems for partial subsidization of the difference in prices between low-emission vehicles and standard vehicles. Subsidy requirements such as fleet size limitations are relaxed for truck transport operators who have received the Green Management Certification.

○Certification acquisition subsidy systems

Local governments:

8 organizations (Hitachi City, Ibaraki Prefecture; Sumida-ku, Tokyo; Nerima-ku, Tokyo; Katsushika-ku, Tokyo; Yokohama City, Kanagawa Prefecture; Shiojiri City, Nagano Prefecture; Himeji City, Hyogo Prefecture; Saga City, Saga Prefecture)

Industry groups

Japan Association of Refrigerated Warehouses, 35 prefectural Trucking Associations

(Hokkaido, Aomori Prefecture, Iwate Prefecture, Miyagi Prefecture, Fukushima Prefecture, Ibaraki Prefecture, Tochigi Prefecture, Gunma Prefecture, Saitama Prefecture, Chiba Prefecture, Tokyo Metropolis, Kanagawa Prefecture, Niigata Prefecture, Nagano Prefecture, Fukui Prefecture, Gifu Prefecture, Aichi Prefecture, Mie Prefecture, Shiga Prefecture, Osaka Prefecture, Hyogo Prefecture, Nara Prefecture, Wakayama Prefecture, Tottori Prefecture, Okayama Prefecture, Hiroshima Prefecture, Tokushima Prefecture, Kagawa Prefecture, Kochi Prefecture, Fukuoka Prefecture, Nagasaki Prefecture, Kumamoto Prefecture, Oita Prefecture, Miyazaki Prefecture, Kagoshima Prefecture)

②Implementation of the Excellent Eco-Commuting Business Site Certification System

The Excellent Eco-Commuting Business Site Certification System has been implemented since June 2009 to certify business sites which actively promote eco-commuting, widely sharing information on their efforts in order to promote greater adoption of eco-commuting.

The "Conference on Promotion of Public Transport", consisting of various transport operator organizations, economic organizations, related government bureaus, and other organizations, acts as its certification body. MLIT's Policy Bureau Regional Transport Division and the Eco-Mo Foundation jointly operate the certification system as the secretariat. By the end of December 2023, 839 business sites have been certified and registered.

Certified establishments that have made particularly outstanding efforts may be recommended for the Minister of Land, Infrastructure, Transport and Tourism Award.

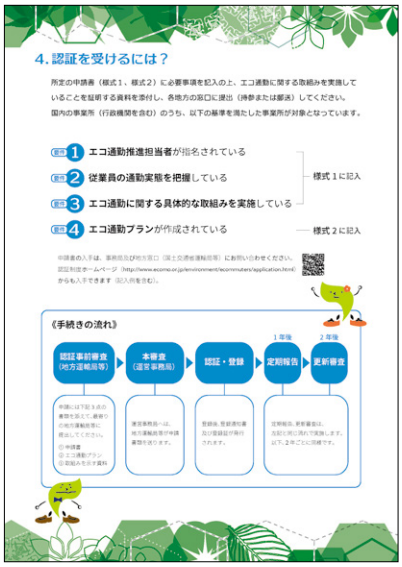
Since FY2017, the Eco-Mo Foundation have been reviewing our promotional strategy, advancing the updating or creation of tools, and in FY2023, the Eco-Mo Foundation revised the format in conjunction with the update of the system explanation pamphlet to make it easier to understand the four certification requirements and others.

●Eco-commuting promotion leaflet (created in 2020) cover for the first contact tool (two types: for municipalities and for companies, businesses and etc.)

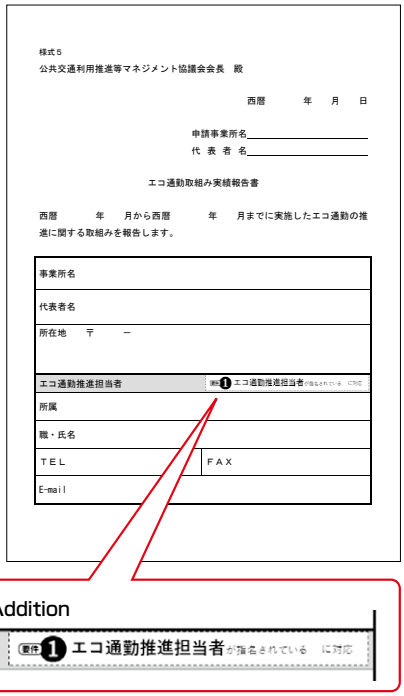
●Video: "Understanding the Excellent Eco-Commuting Business Site Certification System in 90 Seconds"

https://youtu.be/MTuz8quQrHY
(Ministry of Land, Infrastructure, Transport and Tourism's YouTube Channel)

●Part of the updated page of the second contact tool, the System Explanation Pamphlet (created in 2023).



●Example of format revision.


様式5
公共交通利用推進等マネジメント協議会会長　殿

西暦　　年　月　日

申請事業所名＿＿＿＿＿＿＿＿
代表者名＿＿＿＿＿＿＿＿

エコ通勤取組み実績報告書

西暦　　年　月から西暦　　年　月までに実施したエコ通勤の推進に関する取組みを報告します。

事業所名	
代表者名	
所在地　〒　－	
エコ通勤推進担当者	要件1 エコ通勤推進担当者が指名されている　に対応
所属	
職・氏名	
TEL	FAX
E-mail	

Addition

要件1 エコ通勤推進担当者が指名されている　に対応

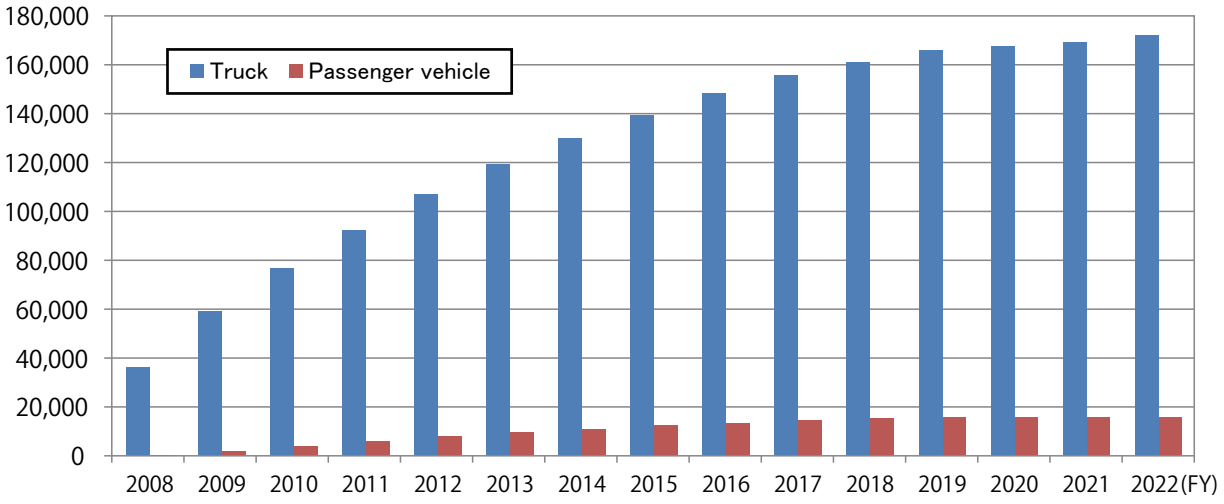
③Promotion of eco-driving

The Eco-Mo Foundation acts as the secretariat of the Eco-Drive Promotion Implementation Council (consisting of 16 transport related organizations) as well as conducting activities in order to promote the spread of diverse eco-driving independently.

Since April 2007 it has offered truck eco-driving training certification, and then passenger vehicle eco-driving training certification from September 2008, and presents attendants who have successfully completed training at certified organizations with completion certificates.

Since FY2011, the "Eco-Driving Activity Contest" has been held under the auspices of the Eco-Drive Promotion Liaison Committee (National Police Agency, Ministry of Economy, Trade and Industry, Ministry of Land, Infrastructure, Transport and Tourism, and Ministry of the Environment) and the Eco-Driving Promotion Council, with the "Minister of Land, Infrastructure, Transport and Tourism Award" (business category) and the "Minister of the Environment Award" (general category) being given since FY2014. The award ceremony for the top winners for FY2023 was held on November 28 during the "Eco-Driving Symposium FY2023".

●Accumulated number of completed certificates issued



●FY2023 Eco-Drive Activity Contest award ceremony

●Contest leaflet

④Promotion of Environmentally Sustainable Transport (EST)

The OECD has proposed Environmentally Sustainable Transport (EST) (see page 41), and organizations such as Japan's MLIT have implemented EST model projects. In order to achieve greater use of EST by local governments and transport operators, since FY2006 the Eco-Mo Foundation has worked with academic experts, related groups, EST related ministries and agencies, and other organizations to promote EST.

The application for the 13th EST Transport Environmental Awards, which commends outstanding efforts in regional transport environmental initiatives, was conducted. T-PLAN Co., Ltd. and the (GIA) Himeshima Ecotourism were awarded the Minister of Land, Infrastructure, Transport and Tourism Award, and Shikaoi Town received the Environment Minister' s Award for FY2023. In July, a symposium (the 13th EST Promotion Forum) was held in Tokyo, which also served as the award ceremony. Additionally, seminars (EST Creation Seminars) targeting municipalities and transport operators were held online and in person in collaboration with regional transport bureaus. These seminars were held in collaboration with Shikaoi Town in Hokkaido and Himeshima Village in Oita Prefecture. Furthermore, a three-day human resources development workshop (the 11th Regional Transport Environmental Measures Promoter Training Seminar) was held in Oda City, Shimane Prefecture, which included study tours and deliberation sessions in addition to the seminars.

In addition, information was provided through the EST portal site (https://www.estfukyu.jp/) and newsletter as well as SNS (https://twitter.com/officeEST).

●Results of the 13th EST Transport Environmental Awards

Awards	Awarded Organization Name	The main initiative names
Grand Prize	【MLIT Award】 ○T-PLAN Co., Ltd. and (GIA) Himeshima Ecotourism (Himeshima Village, Higashikunisaki District, Oita Prefecture)	Initiatives using renewable energy and small electric vehicles (EVs) to address challenges in remote islands
Grand Prize	【MOE Award】 ○Shikaoi Town (Katou District, Shikaoi Town, Hokkaido)	EST Model Project" centered around "Hydrogen from Livestock Excreta"
Excellent Award	○The Consortium for Regional Transport Development with a Focus on GSM in the Oomori District of the Iwami Ginzan Silver Mine, a UNESCO World Heritage Site.(Oda City, Shimane Prefecture)	Operation of "Ginzan Cart," a Green Slow Mobility (GSM) service, in the Iwami Ginzan Silver Mine World Heritage Site, Oomori District.
Encouragement Award	○The Oirase Keiryu River Utilization Rationalization Council, the Oirase Keiryu River Eco-Tourism Project Executive Committee (Towada City, Aomori Prefecture)	The Oirase Keiryu Eco-Tourism Project
Encouragement Award	○Kinosaki Onsen Transport Environment Improvement Council (Kinosaki-cho, Toyooka City, Hyogo Prefecture)	Implementation of the "Sozoro Walking Rules" as a unified effort within the community.
Encouragement Award	○Wakayama Prefecture (Throughout Wakayama Prefecture)	"WAKAYAMA8∞ - Sustainable Tourism Development Through Cycling"

●Green Slow Mobility along Himeshima Coastline (T-PLAN Co., Ltd., (GIA) Himeshima Ecotourism)

●Hydrogen Station and Hydrogen Fuel Cell Vehicles (Shikaoi Town)

⑤Promotion of mobility management education (Transport Environment Education)

In order to promote mobility management education (transport environment learning), this project supports local governments and elementary, junior high, and high schools in creating the basis for continuous implementation, preparing and distributing educational declarations and case studies that serve as guidelines, and distributing an e-mail magazine.

In 2023, the project provided support to the following 19 elementary, junior high, and high schools.

●Supported schools and themes for 2023

School name	Study theme title
Hokko Elementary School, Sapporo City, Hokkaido	Know and Use: Everyone's Transport
Shinko Elementary School, Sapporo City, Hokkaido	"Sapporo-style Transport Environment Learning"
Wakakusa Elementary School, Tomakomai City, Hokkaido	"Let's Learn About the Region's Nature and Culture"
Hirano Elementary School, Adachi-ku, Tokyo	"Traffic and Environmental Studies"
Shimoizumi Elementary School, Yokohama City, Kanagawa	"School's 50th Anniversary Project"
Gakuden Elementary School, Inuyama City, Aichi	"Gakuden Identity Education: Understanding Gakuden through the Komaki Line"
Mishima Elementary School, Ibaraki City, Osaka	"See, Learn, Understand: SDGs in Mishima Town - Our Town's New Station"
Fukui Elementary School, Ibaraki City, Osaka	"The Transport Issues in the Fukui Region and Environmental Problems in the Car Society"
Sashiki Elementary School, Nanjo City, Okinawa	"Exploring Historical Sites in Nanjo City Using the N Bus (Hometown Learning)"
Togashira Junior High School, Toride City, Ibaraki	"Let's Develop and Propose Autonomous Bus Solutions for Toride City"
Nishihatsuishi Junior High School, Nagareyama City,Chiba	"Local Transport: Research Study and Presentation Event"
Daito Junior High School, Kawagoe City, Saitama	"Love for Daito: Tracing the Main Artery and Abandoned Railways"
Horikiri Junior High School, Katsushika-ku, Tokyo	"Aiming to Revitalize the Community and Schools through Collaboration and Utilization of Public Transport"
Rituryo Junior High School, Kyoto City, Kyoto	"Geographical Aspects of Social Studies: 'The Existence of Communities'"
Attached Junior High School of Saikyo High School, Kyoto City, Kyoto	"Comprehensive Learning Time: 'EP Internship'"
Doshisha Junior high, and High School	"Sustainable Station Development Fostering Community Interaction: Eizan Railway, Hachiman-mae Station Project"
Momoyama Junior High School, Kyoto City, Kyoto	"Civic Studies: Considering Local Governance through Public Transport"
Momoyama Junior High School Attached to Kyoto University of Education	"Questioning the Extension of the Hokuriku Shinkansen to Kyoto from an Economic and Environmental Perspective"
Sasebonishi High School, Nagasaki	"Research on Public Transport Fostering Coexistence with Local Communities"

⑥ Exhibit at EcoPro 2023

The EcoPro Exhibition is a comprehensive exhibition on environmental issues that has been held at Tokyo Big Site since 1999 to promote environmentally friendly products and services. This is one of the leading environment-related events in Japan, attracting business people, government officials, and general consumers.

Eco-Mo Foundation participated in the exhibition, presenting the current status of global warming issues and its countermeasures in the transport sector as well as introducing the Foundation's activities through a video and panel display.

(Participants in EcoPro 2023: 442 companies and organizations as presenters; approximately 67,000 visitors; the number of people who visited Eco-Mo Foundation booth: approximately 2,800)

●The Eco-Mo Foundation Booth Photos

⑦Promotion of Green Slow Mobility

The waning of public transport in provincial areas of Japan has produced a greater environmental impact as the result of growing use of personally-owned vehicles and created mobility problems for senior citizens unable to drive.

Green Slow Mobility have little environmental impact and can coexist harmoniously with pedestrians and cars due to their low maximum speed of under 20km/h. Hopes are high for the potential these vehicles have to address environmental impact and reduced senior mobility problems when used for living activities within communities and as a means of transport in tourist destinations, helping achieve an even lower carbon society.

Golf carts have been permitted to drive on public roads since 2014, and societal pilot tests have finally begun. Since FY2018, efforts have been made to increase the promotion of Green Slow Mobility through national verification experiments, vehicle purchasing subsidies, etc.

The Eco-Mo Foundation continues its efforts to promote the widespread adoption of green slow mobility by conducting test runs and demonstration surveys for the utilization of green slow mobility in remote island areas using experimental vehicles owned by the foundation. Additionally, the foundation organizes training sessions, provides operational know-how, and continues its efforts to support the utilization of green slow mobility.

●The Eco-Mo Foundation conducts test runs and demonstration surveys for green slow mobility in remote island areas.

FY	Test run and demonstration areas
2022	Toshi Island (Toba City, Mie Prefecture)　Sagi Island (Mihara City, Hiroshima Prefecture)
2023	Saku Island (Nishio City, Aichi Prefecture)　Ibuki Island (Kanonji City, Kagawa Prefecture) Amami Oshima (Amami City, Kagoshima Prefecture)　Shodoshima Island (Shodoshima Town, Kagawa Prefecture) Okinoerabu Island (China Town, Kagoshima Prefecture) Itsukushima (Miyajima) (Hatsukaichi City, Hiroshima Prefecture)

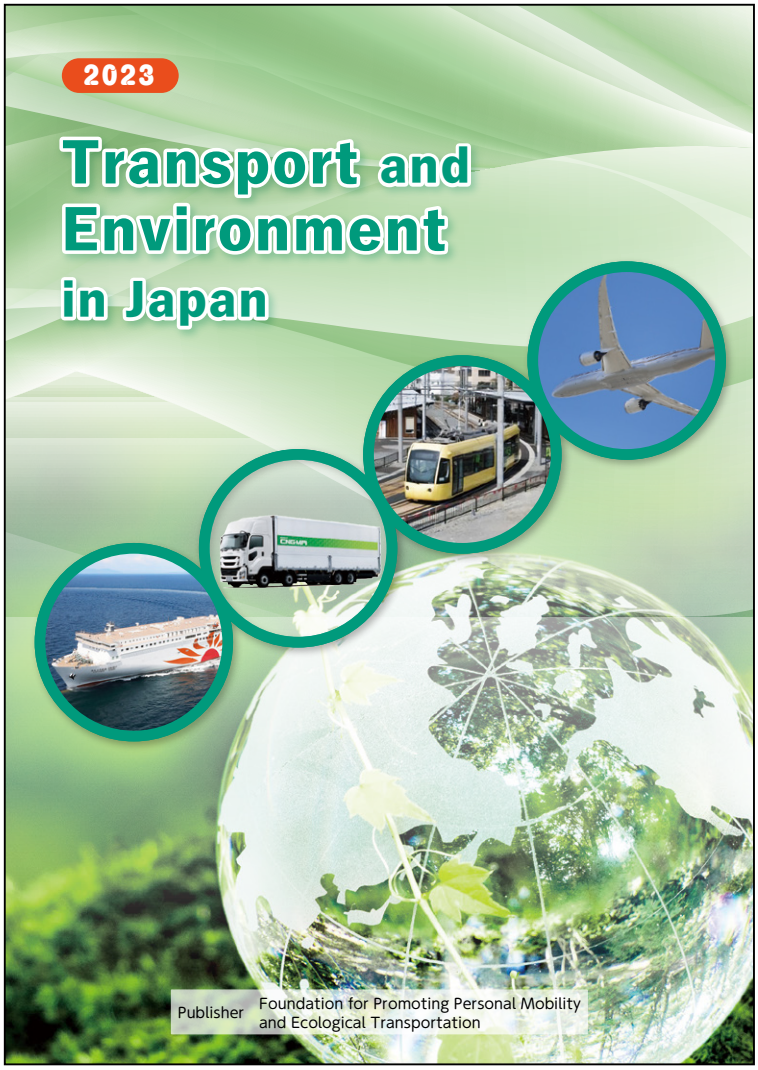
●Test run and demonstration survey (Left: Saku Island, Right: Okinoerabu Island)

●Training workshop (Attendance at safety briefing: Miyako City / Test ride in the implementation area: Rikuzentakata City)

⑧Publication of "Transport and Environment in Japan"

The Foundation has published "Transport and Environment in Japan," which provides basic data and the latest countermeasures against the environmental problems and challenges of the transport sector (global warming, air pollution, waste, recycling, sea pollution, noise, etc.), as well as introducing the activities of local governments, businesses, citizens' groups, the Eco-Mo Foundation, and more. Since FY2015 an English version has also been published to showcase Japan's transport environment measures and countermeasures overseas. (The English version can be downloaded from the Eco-Mo Foundation website.)

●Transport and Environment in Japan 2023 English Version



English Translation Download Page
http://www.ecomo.or.jp/english/tej.html

Ⅳ. Measures in Response to Other Environmental Issues

1 Noise related measures

(1) Automobile noise countermeasures

A study of automobile noise environmental standard compliance status conducted in FY2021 found that of the approximately 9,365,000 homes studied, approximately 510,100 (5.4%) homes had automobile noise levels which exceeded environmental standards either during the day (6:00 a.m. to 10:00 p.m.), at night (10:00 p.m. to 6:00 a.m.), or both. Approximately 250,800 homes (2.7%) exceeded environmental noise standards both during the day and at night.

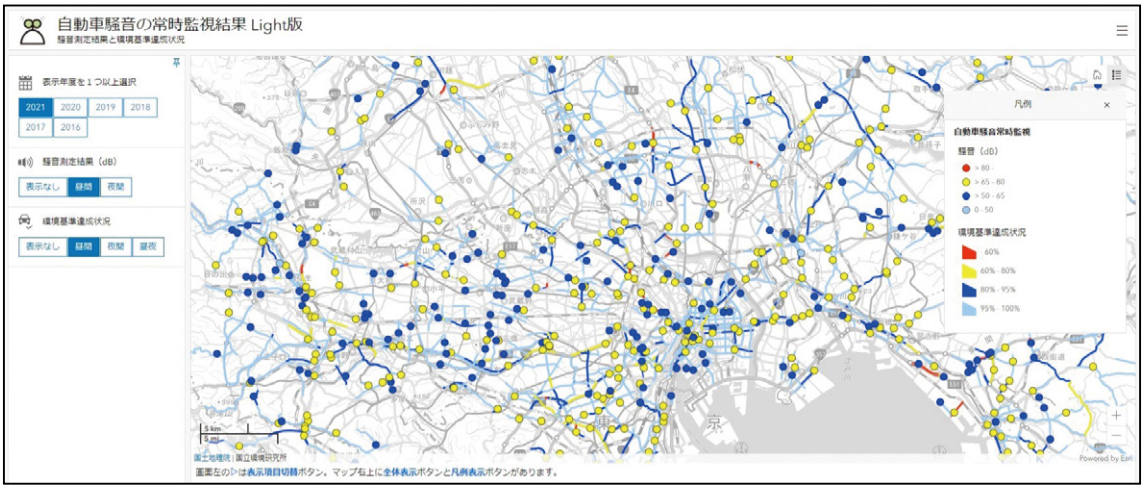
Of the approximately 4,007,000 homes in areas along major arterial roads, approximately 352,400 (8.8%) homes exceeded environmental noise standards during the day, at night, or both. Of those, approximately 169,900 (4.2%) homes exceeded environmental noise standards both during the day and at night.

Changes in the compliance of environmental noise standards must take into consideration changes in the homes investigated each year, but within the reported scope there appears to have been a gradual improvement over time.

Broken down by road type, the largest share of homes in areas exceeding environmental noise standards either during the day, at night, or both were located near urban expressways. Of the approximately 103,600 homes located in these areas, approximately 18,900 homes (18.3%) exceeded environmental noise standards. (Source: Ministry of the Environment "Automobile Transport Noise in FY2021")

This information is provided together with corresponding maps on the Nationwide Automobile Noise Map (Environmental GIS Automobile Noise Survey Report) website, operated by the National Institute for Environmental Studies (NIES).

●Nationwide Automobile Noise Map



Source: NIES

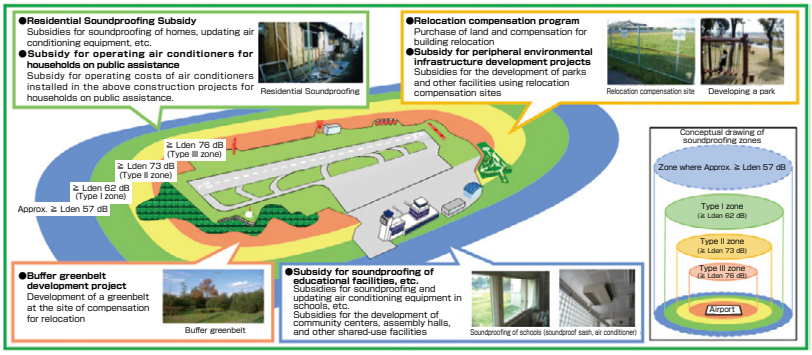
(2) Railway noise countermeasures

Regarding noise from Shinkansen, based on "Environmental Quality Standards for Shinkansen Superexpress Railway Noise" that was announced by the Environment Agency in 1975, countermeasures such as setting up and raising height of soundproof walls, are continued to be promoted to achieve the environmental quality standards. Further, regarding noise from conventional railway lines, based on the "Noise Countermeasure Guidelines Regarding the New Construction or Large-Scale Improvement of Conventional Railway Lines" that was published by the Environment Agency in 1995, countermeasures such as the use of long rails are continued to be promoted to meet the Guidelines.

(3) Aircraft noise countermeasures

Aircraft noise countermeasures in Japan can be broadly categorized into source control, improvement of the airport structure and environmental measures in areas surrounding airports. Combinations of these measures are being implemented in a balanced way according to the characteristics of each airport.

●Airport Periphery Environmental Management Project – General drawing



Source: MLIT (Tentative translation by Eco-Mo Foundation)

Regarding the source control, there are such measures as noise reduction of aircrafts, improvement in the operation method and restrictions on departures and landings. As a result of advancements in noise reduction technology, the latest aircrafts can achieve an approximately 30dB noise level reduction in comparison to aircrafts 50 years ago.

As for improvement of the airport structure, efforts are being made to open offshore airports where the effects of noise are minimal, as well as to install sound-insulating walls.

With regard to environmental measures in areas surrounding airports, based on the Act on Prevention of Damage Caused by Aircraft Noise in Areas Around Airports (Act No. 110 of 1967), subsidies for noise prevention works in residences and schools are being granted and development of green belts, etc. is being carried out.

The Eco-Airport Guidelines were established in order to assist with environmental protection and creation for airports and their surrounding communities. Based on these guidelines, eco-airport design is being implemented in airports through measures such as the creation of environmental plans for airports and their surrounding areas, and through support for the installation of Ground Power Units (GPUs).

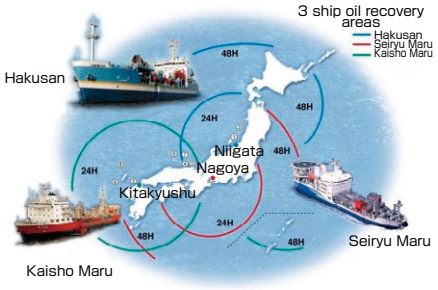
2 Sea pollution countermeasures

(1) Large scale oil spill countermeasures

One of the major factors behind the large scale oil spills in recent years is the existence of ships which do not meet the standards set forth in Marine Safety and Sea Environmental Conservation Treaties (sub-standard ships). In order to eliminate these ships, Japan is participating in international efforts such as the creation of an international ship database (EQUASIS), as well as enhancing port state control (PSC) by performing onboard inspections of foreign vessels stopping in Japanese ports confirming that they meet treaty standards.

The creation of a system, advocated for by the Japanese government, for checking that flag state governments are fulfilling their duties to monitor and supervise ships flown under their flags was approved at the 2005 IMO general meeting as a voluntary system. Based on the efforts that followed, this system was made mandatory from January 2016.

● Coverage scope of system of 3 large dredging and oil reclamation ships



"Hakusan" can start oil recovery operation within 24 hours in the Japan Sea area, and even in the Hokkaido sea area can start operation within 2 days. Together with the "Seiryu Maru" and the "Kaisho Maru", it helps further enhance Japan's ability to respond to oil spills around Japan.

Source: MLIT (Tentative translation by Eco-Mo Foundation)

There are three large vessels for dredging and oil recovery deployed in the country, and there is a public-private oil control system established in accordance with the Law Relating to the Prevention of Marine Pollution and Maritime Disasters so that they can respond immediately in the event of an oil spill incident in the waters surrounding Japan. Furthermore, there is a system established for Japan, China, South Korea and Russia to respond in a cooperative manner to a large-scale oil spill in the waters surrounding Japan; the international cooperation and coordination is being strengthened through the "Northwest Pacific Action Plan (NOWPAP) Regional Oil, Hazardous and Noxious Substances (HNS) Spill Contingency Plan (2008)".

(2) Countermeasures against harmful aquatic organisms in ballast water

Various organisms such as plankton contained in ballast water (seawater loaded as a safety weight when a ship is empty) can induce harmful effects on the ecosystem and cause damages to human health and economic activities when they are transported to places where they do not belong and released in the ballast water being discharged. In order to implement a standardized regulation worldwide as a countermeasure to this problem, the Ballast Water Control and Management Convention, adopted by the International Maritime Organization (IMO) in February 2004 came into force in September 2017. Japan has concluded the Convention and has guaranteed it domestically through the Law Relating to the Prevention of Marine Pollution, etc. and Maritime Disasters.

As of September 2023, 16 hazardous water ballast treatment facilities from 13 companies have received type designation based on the latest standards (BWMS Code), and the first hazardous water ballast treatment facility "JFE BallastAce" developed by JFE Engineering Corporation, which was put into practical use after receiving type designation from the Ministry of Land, Infrastructure, Transport and Tourism, has been installed on board of a ship owned by Nippon Yusen Kaisha (NYK) Corporation. Since its installation on NYK's car carrier "Emerald Leader" in August 2010, many vessels have been equipped with the hazardous water ballast treatment system.

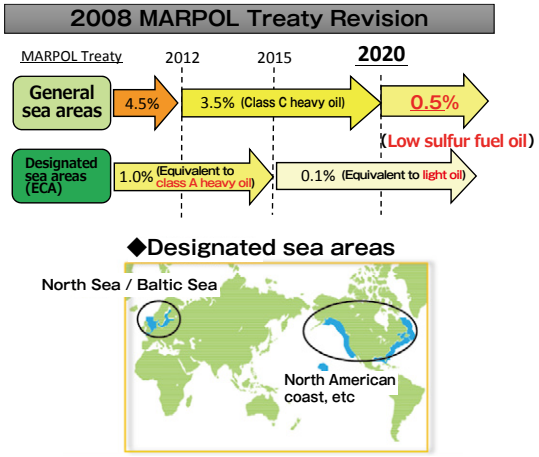
3 Ship exhaust gas emissions countermeasures

In order to reduce air pollution caused by Sulphur Oxides (SOx) emitted from ships, the Sulphur content in ship fuel oil is being regulated on a global scale under the MARPOL Convention. Due to revisions to the MARPOL Convention in 2008, the allowance of Sulphur content was strengthened from its previous level of 3.5% or less to 0.5% or less from January 2020.

●International regulations for reducing Sulfur Oxide (SOx) and Particulate Matter (PM) emissions

Summary of SOx regulations

- Through the revising of the MARPOL Convention in 2008 by the International Maritime Organization (IMO), the allowance of Sulphur content within fuel oil for ships was globally strengthened from its previous level of 3.5% or less to 0.5% or less from January 2020.
- For Japan, as an environmentally advanced country, it is necessary to appropriately handle the reduction of the bad effects on human health and the environment from the SOx emissions of ships.



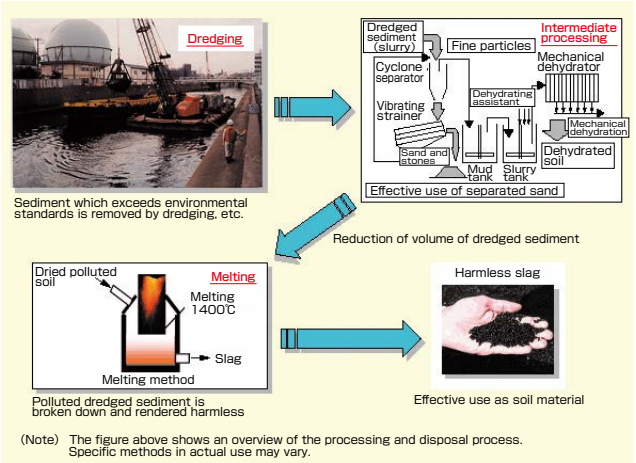
Source: MLIT (Tentative translation by Eco-Mo Foundation)

4 Chemical substances countermeasures

(1) Dioxin, etc. countermeasures

Dioxins are produced when garbage and other matter are burned. There are concerns about the harm these chemicals cause to the human body. The MLIT is studying dioxins and implementing countermeasures, monitoring marine pollution conditions, and carrying out other measures by establishing a "Fundamental Policy Regarding Countermeasures Against Sediment Dioxins", technical guidelines concerning the removal of sediment in ports with dioxin levels exceeding environmental standards for sediment, and revising the "Manual of Sediment Dioxin Countermeasures for Rivers, Lakes, etc." (the River Manual) and the "Technical Guidelines Regarding Sediment Dioxin Countermeasures for Ports" (the Port Guidelines).

●Dioxin, etc. countermeasures



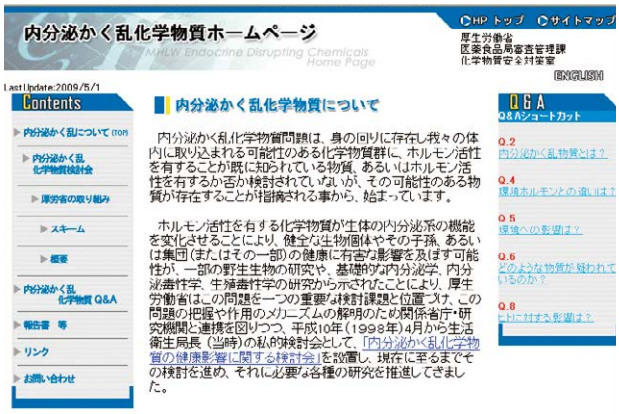
Source: MLIT (Tentative translation by Eco-Mo Foundation)

(2) Endocrine disruptors countermeasures

Endocrine disruptors (environmental hormones) disrupt the endocrine systems of people and wild animals, producing a number of adverse effects such as reducing sperm counts.

The need for countermeasures in response to these endocrine disruptors is growing year by year. In September 2008 the "International Convention on the Control of Harmful Anti-fouling Systems in Ships (AFS Convention)" went into effect. This global convention completely prohibits the use of ship hull antifouling paint containing tributyltin (TBT), an endocrine disruptor. The convention prohibits new application of TBT paint, and requires ship owners to completely remove all TBT paint already applied to ships, or to coat painted portions with a protective layer which prevents leaching of TBT into seawater. All foreign ships entering Japanese ports are prohibited from using TBT hull antifouling paint, so when the MLIT actively includes monitoring for TBT hull antifouling paint usage as part of its port state control (PSC) monitoring of whether arriving foreign ships are in conformance with international conventions regarding marine safety and marine environmental conservation, with the aim of eliminating foreign ships on which toxic hull paint has been used.

●Endocrine disruptor website



Source: Ministry of Health, Labour and Welfare (Tentative translation by Eco-Mo Foundation)

(3) Asbestos countermeasures

●Asbestos countermeasure pamphlet

Source: MLIT

Asbestos, used in various facilities, such as warehouses and storage sheds, present a life-threatening hazard. The buildings constructed in the 1970s and onwards, when large amounts of asbestos were imported, are reaching the ends of their lifespans and will be dismantled, so it is important to implement preemptive measures to prevent this work from causing public harm.

The MLIT is following up on the status of asbestos removal and scatter prevention measures for facilities under its jurisdiction in order to advance the removal of asbestos from existing buildings. In addition, measures for removing spray-applied asbestos insulation in existing buildings are being promoted though activities such as subsidies for residence and building safety stock formation operations and local housing subsidies.

In conjunction with revisions to the Building Standards Act the use of spray-applied asbestos insulation etc. in buildings has been prohibited, and Japan is disseminating information in the form of asbestos removal work reference estimates, documents which assist with the process of identifying building materials containing asbestos (visually identifiable building materials containing asbestos), by compiling databases of information regarding building materials containing asbestos, and preparing pamphlets regarding building asbestos countermeasures. Japan is also implementing measures for thoroughly ensuring the prevention of asbestos scattering or exposure during building dismantling.

(4) PRTR(Pollutant Release and Transfer Register) system

●PRTR pamphlet

Source: METI and MOE

There is growing interest around the world in environmental pollutants such as environmental hormones and new chemical substances produced by high-tech industry. In 1992 the UN Conference on Environment and Development (Earth Summit) indicated the need for a system for managing the discharge and movement of hazardous chemicals in order to reduce their inherent risks.

In response, in 1999 Japan formulated the "Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof (PRTR Law)". This act defines a system for confirming, tabulating, and publicly releasing data on which of a wide range of hazardous chemicals have been produced, by whom they were produced, how much of the chemicals have been released into the environment, and how much of the chemicals have been taken off from company properties in the form of waste products. This system has been in effect since 2001.

Under this act, warehouse operators (limited to warehousing to store farm products or to store gas or liquid in storage tanks) and automobile maintenance operators are also required to report transfers of specified chemical substances.

5 Ozone layer destruction prevention

The ozone layer which envelops the earth plays an important role in protecting life on the earth by absorbing harmful ultraviolet radiation. When this ozone layer is damaged, it allows a greater amount of hazardous ultraviolet radiation to pass through, increasing the incidence of skin cancer and cataracts, and impairing immunity in humans as well as affecting animal and plant ecosystems.

Fluorocarbons (CFCs and HCFCs), used as coolants in devices such as refrigerators and air conditioners, are known to damage the ozone layer. Fluorocarbons are greenhouse gases that are hundreds to tens of thousands of times stronger than carbon dioxide, so it is important to prevent fluorocarbons used in devices (CFCs, HCFCs, and HFCs) from being discharged into the atmosphere in order to protect the ozone layer and prevent global warming.

The "Act on the Protection of the Ozone Layer Through the Control of Specified Substances and Other Measures.," passed in 1995, prohibited the manufacturing of specified fluorocarbons (CFCs), and the "Act for Recycling of Specified Kinds of Home Appliances (the Appliance Recycling Act)", passed in 2001, mandated the reclamation of fluorocarbons from domestic refrigerators and air conditioners. In 2002 "the Act Concerning the Recovery and Destruction of Fluorocarbons (the Fluorocarbon Recovery and Destruction Act)" mandated the recovery of fluorocarbons from industrial air conditioning and refrigeration equipment and vehicle air conditioners.

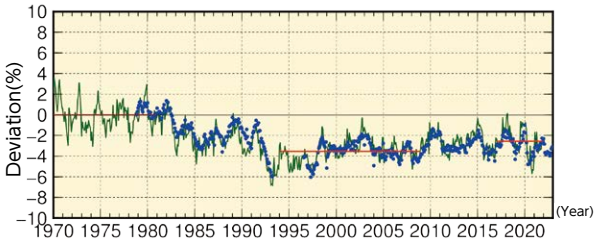
With regard to the recovery of fluorocarbons from vehicle air conditioners and subsequent destruction, due to the fact that vehicle air conditioners are constituent components of automobiles, in January 2005 they were excluded from the scope of the "Fluorocarbon Recovery and Destruction Act", and regulated together with the disposal of vehicle bodies and engines under "the Act on Recycling, etc. of End-of-Life Vehicles", which regulates the appropriate processing and disposal of end-of-life vehicles.

In response to a rapid increase in emissions of fluorocarbons (HFCs) with very strong greenhouse effects, particularly those used as coolants in air conditioning and refrigeration equipment, in June 2013 the Fluorocarbon Recovery and Destruction Act was revised to require that the manufacturers of fluorocarbons and devices which use fluorocarbons, and the users of industrial air conditioning and refrigeration equipment, rationalize fluorocarbon use and appropriately manage fluorocarbons. It also established mechanisms such as a fluorocarbon filling operator registration system and a recycling operator licensing system, and the name of the law was changed to the "Act on the Rational Use and Management of Fluorocarbons (Fluorocarbon Discharge Prevention Act)".

●Changes in global amount of ozone over time

Amount of ozone worldwide

The average amount of ozone worldwide fell significantly from the 1980s to the early 1990s. Since the late 1990s it has remained constant or increased slightly, but the total amount of ozone remains low.

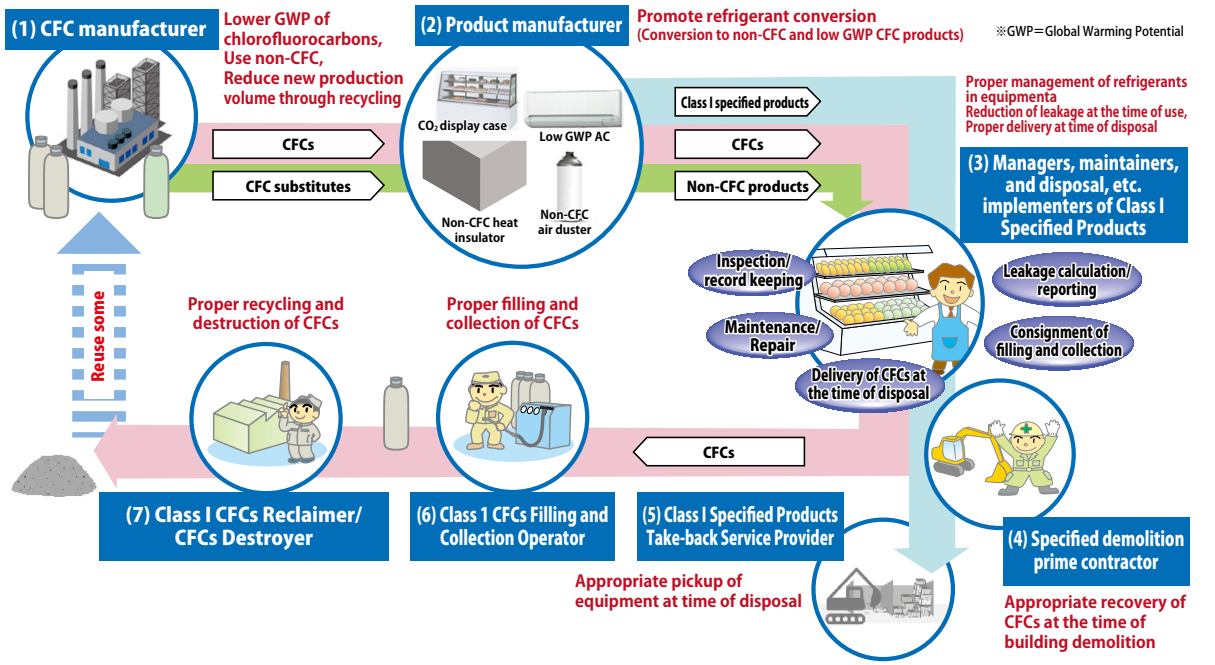


Changes in global amount of ozone over time

This graph shows the percentage of increase or decrease in the average amount of ozone worldwide compared to the average amount for the 1970 to 1980 period.* The solid green line indicates data from ground stations, the blue dot indicates the satellite observation data averaged between 70° N and 70° S latitude, and the red line shows the cumulative average of ground observation data, from which seasonal variations are removed. The terrestrial observation site data was supplied by the World Ozone and Ultraviolet Radiation Data Centre. The satellite observation data was obtained from data supplied by the US National Aeronautics and Space Administration (NASA).
Note: The period before the prominent damage to the ozone layer

Source: JMA (Tentative translation by Eco-Mo Foundation)

●Overview of the Fluorocarbon Discharge Prevention Act



Source: METI and MOE (Tentative translation by Eco-Mo Foundation)

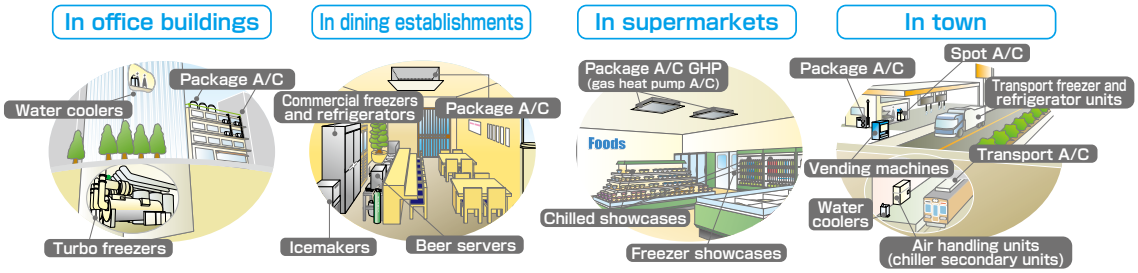
●Fluorocarbon Discharge Prevention Act pamphlet

Fluorocarbons must be reclaimed whenever performing disassembly work!

Under the Act on the Rational Use and Proper Management of Fluorocarbons (Fluorocarbon Release Prevention Act), fluorocarbons must be reclaimed when disposing of commercial air conditioners, refrigerators, or freezers which use fluorocarbons (CFC, HCFC, and HFC).

It is against the law to allow fluorocarbons to be released into the atmosphere when performing disassembly work.

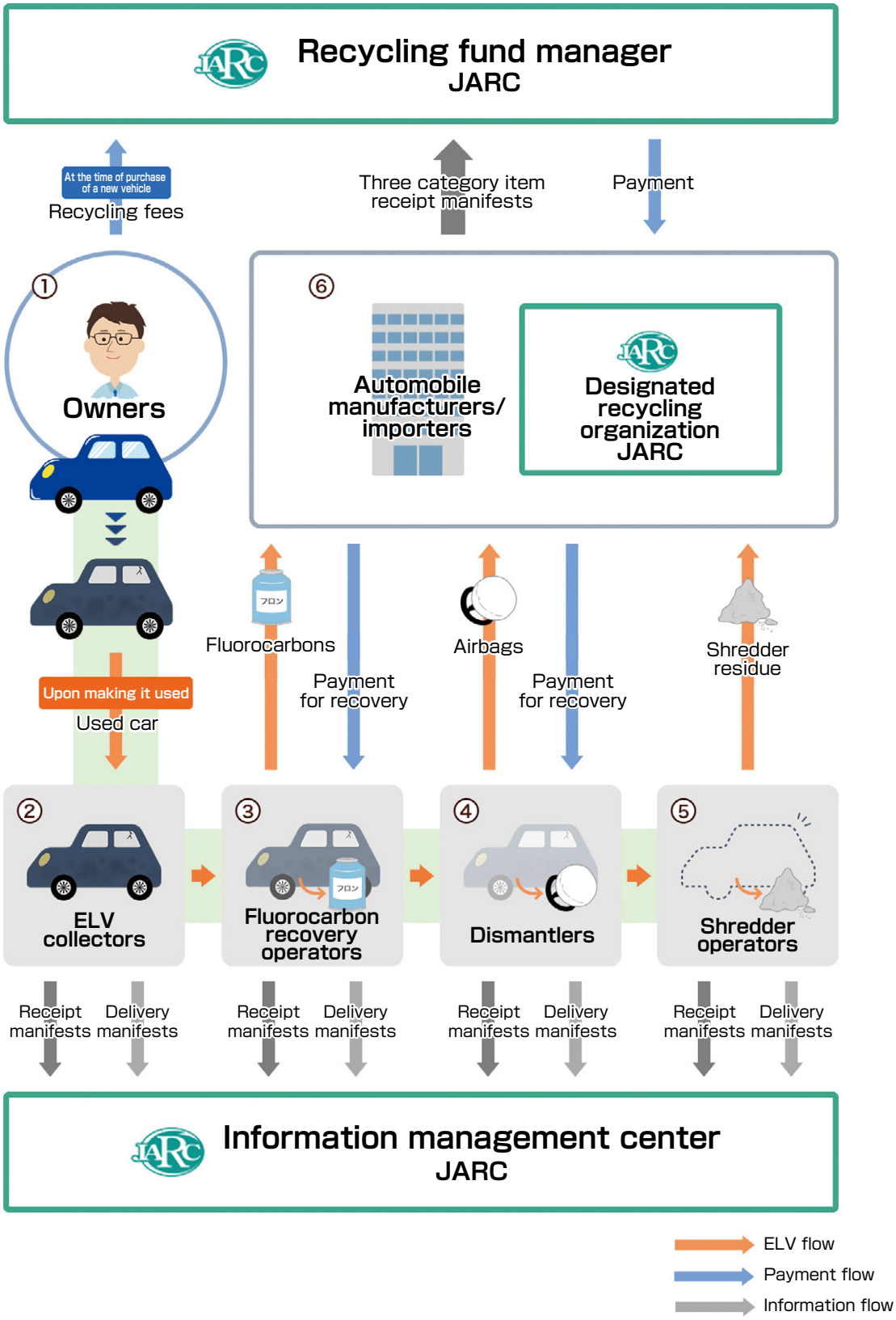
Examples of devices which use fluorocarbons (commercial refrigerators, freezers, and air conditioners)



The penalty for reckless releasing of fluorocarbons is imprisonment of up to 1 year or a fine of up to 500 thousand yen.

Source: METI and MOE (Tentative translation by Eco-Mo Foundation)

●Overview of the Act on Recycling, etc. of End-of-Life Vehicles process



Source: Japan Automobile Recycling Promotion Center (Tentative translation by Eco-Mo Foundation)

6 Global environmental observation and monitoring

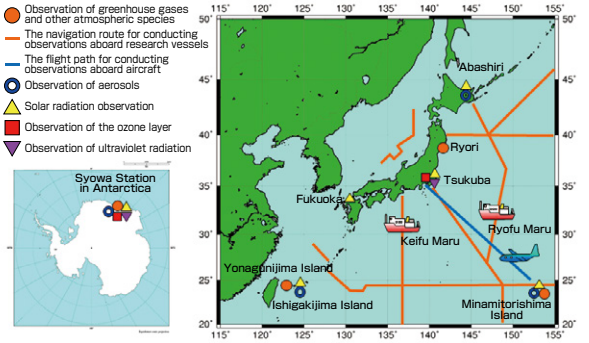
Implementing appropriate environmental problem countermeasures in the transport sector requires the accurate assessment of air and sea changes through steady, long-term observation and monitoring. Diverse air, sea, and other observation and monitoring are being implemented by global monitoring networks.

(1) Climate change observation and monitoring

International efforts aimed at tackling global environmental issues such as global warming are being enhaced. In addition to its previous ongoing efforts, the Japan Meteorological Agency is implementing the following measures in accordance with the "Strategic Policy Regarding Future Global Environmental Operations", formulated and announced in 2008.

In order to assess greenhouse gas conditions, the amount of CO_2 in the atmosphere is being measured at three locations in Japan and the amount of CO_2 in the surface sea water and the air above the northwest Pacific Ocean is being measured by research vessels. Furthermore, precise sunlight and infrared radiation measurements are being performed at five locations in Japan.

●Atmospheric environment monitoring network (as of December 2023)



Source: JMA (Tentative translation by Eco-Mo Foundation)

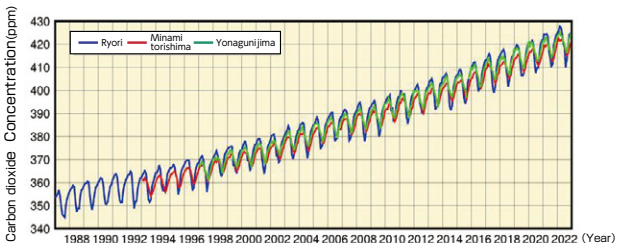
Sea level rise caused by global warming is also being monitored, and information is being released regarding long-term sea level changes along the coast of Japan.

In order to achieve more accurate climate change monitoring and seasonal forecasts, a "Long Term Re-Analysis Project" is being carried out in conjunction with the Central Research Institute of Electric Power Industry. This project analyzes past global atmosphere conditions using consistent methodology, and the findings of the project are being released to research organizations in Japan and abroad.

Based on the latest observation results, the Japan Meteorological Agency compiles the "Climate Change Monitoring Report" and releases the latest scientific information and findings on climate change.

In December 2020, the Japan Meteorological Agency (JMA) and the Ministry of Education, Culture, Sports, Science and Technology (MEXT) released "Climate Change in Japan 2020," an overview of observed changes and projections on climate change, based on the advice of the MEXT/JMA Advisory Board on climate change services.

●Trends in atmospheric carbon dioxide concentration in Japan (3 observational sites)

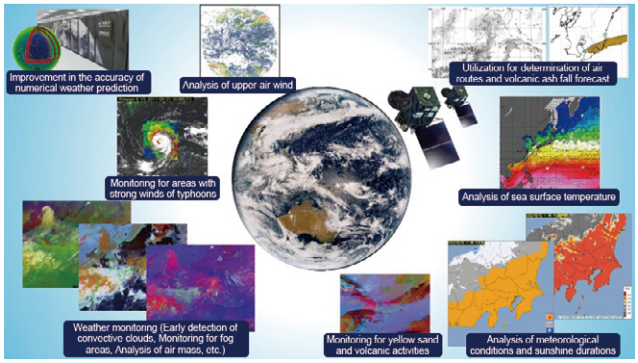


Source: JMA (Tentative translation by Eco-Mo Foundation)

(2) Himawari-8/9

Geostationary meteorological satellite Himawari-8 began observation operations on July 7, 2015, and Himawari-9 began standby operations on March 10, 2017. The roles of the two satellites were switched on December 13, 2022, with Himawari-9 performing the observation operations and Himawari-8 performing the standby operations. The two satellites, Himawari -8/9, continue to provide an uninterrupted meteorological satellite observation system for the purpose of ensuring the safety and security of the public, including monitoring and forecasting of typhoons and torrential rains, safe navigation of aircraft and ships, and monitoring of the global environment and volcanoes.

●Examples of the use of data from Himawari -8/9



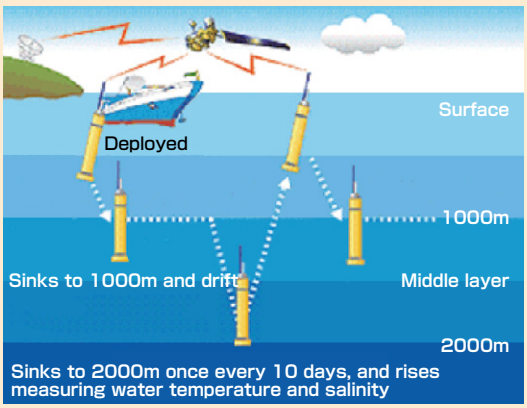
Source: JMA (Tentative translation by Eco-Mo Foundation)

(3) Ocean observation and monitoring

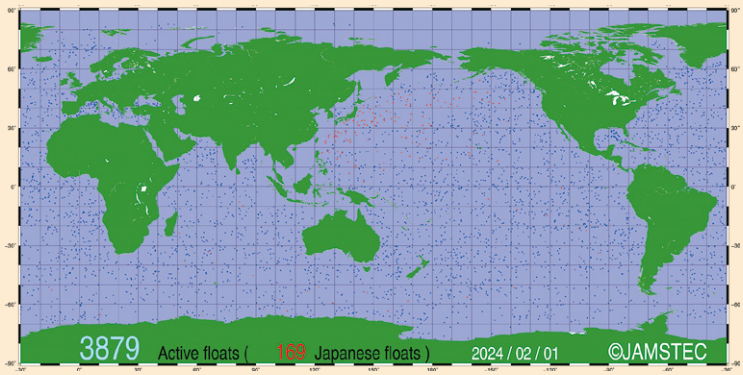
The ocean absorbs CO_2, a greenhouse gas, and retains heat, moderating global warming. Ocean changes are intrinsically linked to typhoons and anomalous weather conditions, so accurately assessing ocean conditions is an important part of responding to global environmental problems.

In order to immediately monitor and assess ocean changes throughout the world, the MLIT is coordinating with other related ministries and agencies, engaging in international collaboration with organizations such as the World Meteorological Organization (WMO) to carry out the Argo project, deploying devices (Argo Floats) around the world to automatically observe conditions within the ocean.

●Overview of Argo project monitoring and Argo Floats distribution



Argo Floats deployed at ocean by research vessels or other vessels sink to a depth of approximately 2,000m every 10 days and then rise again, obtaining vertical water temperature and salinity data and automatically reporting it by transmitting it via satellite.



Worldwide distribution of Argo Floats reporting data within the past month (3,879 Floats as of February 1, 2024. 169 of these Floats are Japanese, indicated with a (●).)

Source: MLIT and Japan Agency for Marine-Earth Science and Technology (Tentative translation by Eco-Mo Foundation)

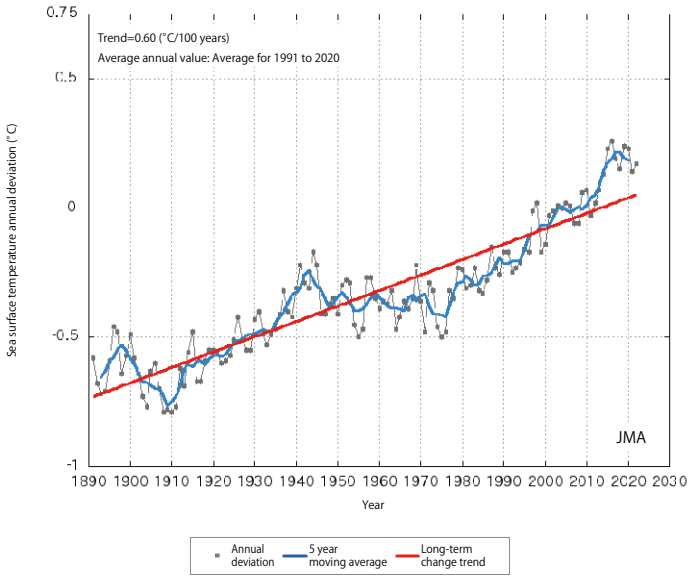
The JMA collects and analyzes data from various sources, such as research vessels, Argo Floats, and satellites, and releases "Marine Diagnosis Report", providing the present status and the prospect for the future regarding marine environment.

The Japan Coast Guard collects and manages oceanographic data obtained by Japan's marine research institutions, and provides it to relevant agencies and the general public as the Japanese Oceanographic Data Center.

●"Marine Diagnosis Report" Long-term trends in sea surface temperature (global average)

Diagnosis (2022)

・The annual mean sea surface temperature (global average) for 2022 was +0.17℃ , which was the sixth highest since the statistics began in 1891.
・The annual mean sea surface temperature (global average) changes due to a combination of oceanic and atmospheric variations over time scales of several years to several decades, global warming, and other influences. The long-term trend is an increase of 0.60℃ per 100 years.



Trends in annual mean sea surface temperature (global mean) changes

Values for individual years are connected with a black line. 5 year moving average values are connected with a blue line. The long-term change trend is indicated with a red line.
The average annual value is the average value for the 30 year period from 1991 to 2020.

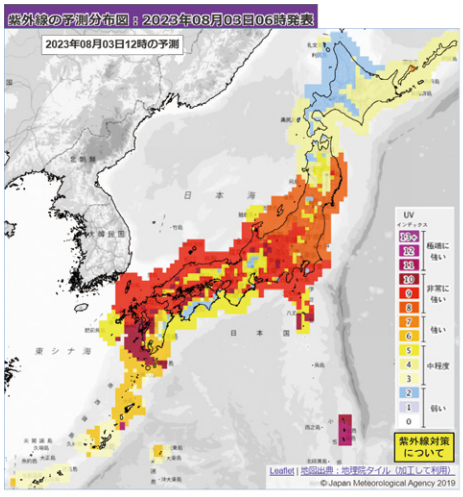
Source: JMA (Tentative translation by Eco-Mo Foundation)

(4) Ozone layer observation and monitoring

In order to protect the ozone layer, which absorbs harmful ultraviolet radiation from the sun, the production, use, and trading of chlorofluorocarbons and other ozone-depleting substances is internationally regulated by the "Montreal Protocol" and other agreements and conventions.

The JMA releases the results of ozone and ultraviolet radiation observation on a yearly basis. It also provides ultraviolet radiation data daily in the form of a UV index, easy-to-understand numerical data indicating the strength of ultraviolet radiation.

●UV index (Prediction value)



Source: JMA

(5) Promotion of regular observation at the Antarctic

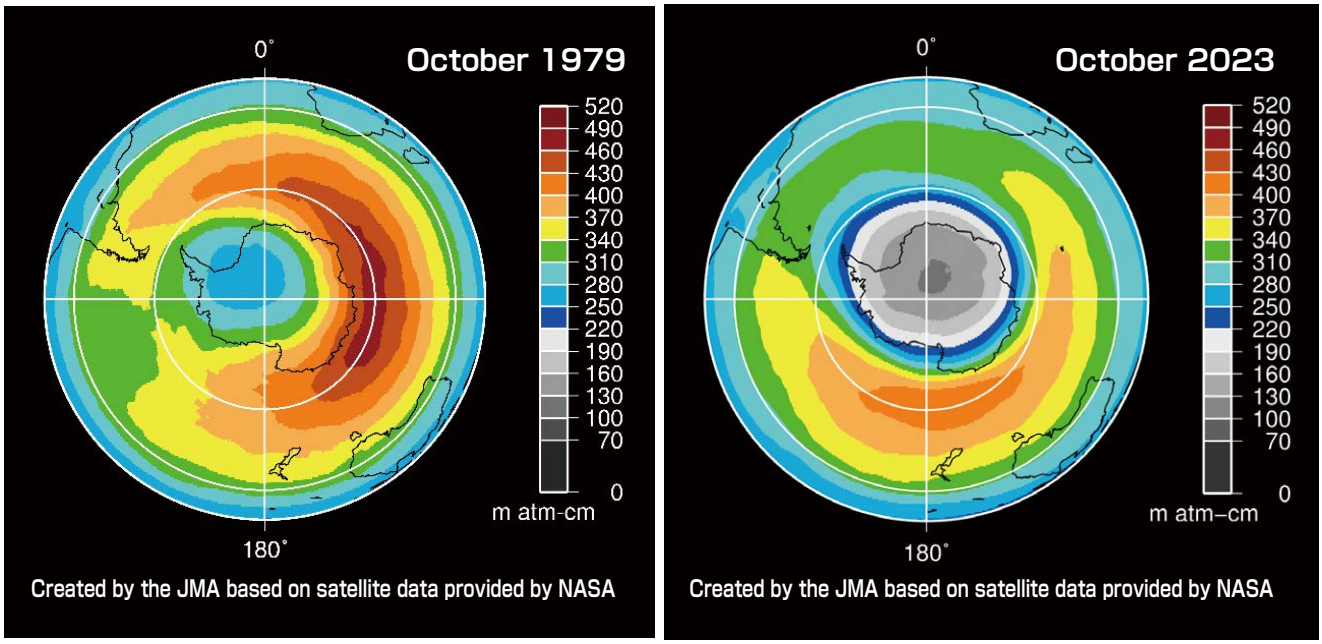
The Geospatial Information Authority creates topographical and other maps based on reference point measurements, gravity measurements, continuous GPS observation, bare rock area change measurements, and photographic measurements. The results contribute to research regarding global environmental changes in the Antarctic, etc., and international activities focusing on land measurement and geographical information.

At the Syowa station the JMA is performing continuous sunlight, infrared radiation, and surface and upper-air meteorological observation. This observation is effectively utilized in international measures, contributing to climate change research and monitoring of the Antarctic ozone hole.

The Japan Coast Guard carries out sea floor topological surveys. It also performs tidal observation, which contributes to monitoring of sea level changes, which are closely linked to global warming.

●Total ozone distribution map in the Antarctic (October)

Southern Hemisphere distribution of monthly average total ozone in October 1979, before the appearance of the Antarctic ozone hole, and in October 2023.
The region with a total ozone of 220m atm-cm or less is the ozone hole.
Created by the JMA based on satellite data provided by NASA.



Source: JMA and NASA (Tentative translation by Eco-Mo Foundation)

7 Adaptation Measures for Climate Change in the Land, Infrastructure and Transport Sectors

In order to deal with the effects from climate change that accompany global warming, not only "mitigation" by restraining greenhouse gas emissions, but also "adaptation" to the already appearing effects and the long-term effects should be promoted.

In October 2021, the "Climate Change Adaptation Plan" based on the Climate Change Adaptation Law was revised in order to strengthen Japan's overall climate change adaptation measures. Under the Plan, relevant ministries and agencies will work closely together to promote climate change adaptation measures under the following seven basic strategies.

① Incorporate climate change adaptation into all relevant measures
② Promote climate change adaptation based on scientific knowledge
③ Consolidate the wisdom of Japan's research institutions and develop an information infrastructure
④ Promote climate change adaptation in accordance with local conditions
⑤ Deepen public understanding and promote climate change adaptation in accordance with business activities
⑥ Contribute to the improvement of adaptation capacity in developing countries
⑦ Ensure close coordination and cooperation systems among relevant government agencies

The Ministry of Land, Infrastructure, Transport and Tourism (MLIT), which has jurisdiction over various fields including land conservation and is responsible for creating a safe and secure national and regional land, has established the pillar "Promotion of Adaptation Measures to Realize a Climate Change Adaptive Society against Climate Crisis" in the "MLIT Environmental Action Plan (revised in October 2021)" that comprehensively summarizes environmental measures within the ministry and has been working to steadily implement various measures in areas including natural disasters, water resources and water environment, national and urban life, and enhancement and utilization of scientific findings.

●Overview of the MLIT Climate Change Adaptation Plan (Summary of policies by sector)

Potential impact of climate change on land, infrastructure and transport

(Natural disasters)	Frequent flooding, extremely large-scale flooding, increase in landslide frequency, significant impact on harbors and coasts
(Water resources/environment)	Greater drought frequency, water quality changes
(Peoples' lives, industrial activity, etc.)	Increased risks to transport infrastructure, large-scale rise in temperatures in urban areas, impact of storm and flood damage on distribution and tourism, etc.

Natural disasters

○Flood damage
- Use facilities to prevent disasters involving flooding and relatively frequent external forces from occurring
- When facilities are subject to external forces which exceed their capacity, mobilize all personnel to implement measures to minimize damage
- Disaster risk evaluation
- Disaster risk information sharing

1) Disaster prevention measures for external forces with relatively high disaster risks
- Thorough facility maintenance
- Improvement of functionality of existing facilities
- Design of facilities to minimize reworking, etc.

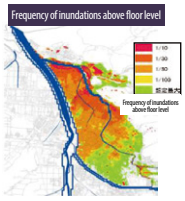
2) Disaster mitigation measures for external forces which exceed facility capacities
① Facility measures involving operation, structure, maintenance procedures, etc.
② Flood mitigation measures integrated with town planning and community development
③ Evacuation, first-aid activity, business continuity, and other preparation

○Landslide disasters
- Measures to address rise in landslide frequency, deep-seated landslide countermeasures
- Warning and evacuation for landslides with little lead time
- Land usage, dwelling styles, etc., that take disaster risks into consideration

○High tides and tidal waves, etc

1) Harbors
- Sea phenomena monitoring and regular evaluation for harbors
- Countermeasures for external forces which exceed protection levels, etc.

2) Coasts
- Disaster risk evaluation and countermeasures for individual disaster risks
- Enhancement of coastal erosion countermeasures, etc.



[Use in detailed disaster risk information evacuation decisions, town planning, etc.]

Water resources/environment

○Water resources
- Measures for thoroughly leveraging existing facilities, using rainwater and reclaimed water, minimizing critical drought damage, etc.

○Water environments
- Monitoring and forecasting related research, water quality improvement measures

Daily life/urban life

○Transport infrastructure
- (Rail) Flooding countermeasures for subway stations, etc.
- (Harbors) Business continuity plan (harbor BCP) formulation
- (Airports) Hazard maps, airport snow removal system review and revision
- (Roads) Safety, high reliability road network improvement, promotion of telephone pole-free design, Active use of bicycle
- (Distribution) Distribution BCP, improvement of disaster support・supply storage agreements, countermeasures for transport obstacles for rail cargo movement

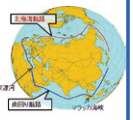

[Subway station flood prevention using water blocking boards]

○Heat islands
- Ground surface covering improvements (promotion of installation of rooftop gardens on private land and public spaces, etc., urban park improvement, treated sewage water usage, etc.)
- Reduction of artificial exhaust heat (energy savings in houses and buildings, promotion of low-emission vehicles, more use of bicycle, promotion of usage houses of sewage heat, etc.)


[Rooftop gardens on private land]

Industrial/economic activity

- Use of Architec Sea route



- Measures for providing information to foreign travelers and countermeasures for damages by rumors

Basic measures

○Promotion and awareness raising, information provision
- Promotion and awareness raising regarding disaster prevention and climate change information
- Provision of geospatial information, etc.

○Observation, research, and technical development
- Climate, sea level, and land observation and monitoring
- Climate change forecasting, analysis of snow and ice environment change trends, etc.
- Impact of growing external forces on flooding and inland water measures and countermeasures

○International contributions
- Global provision of Japanese disaster sector technologies and expertise
- Participation in international observation, monitoring, and research, etc.

Source: MLIT (Tentative translation by Eco-Mo Foundation)

List of Abbreviations

BRT (Bus Rapid Transit)
CMP (Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol)
CNG (Compressed Natural Gas)
COP (Conference of Parties to the UNFCCC)
EDMC (the Energy Data and Modelling Center)
ELV (End-of-Life Vehicle)
ETC (Electronic Toll Collection System)
EU (European Union)
FY (fiscal year)
GIA (General Incorporated Association)
GIF (General Incorporated Foundation)
GIO (The Greenhouse Gas Inventory Office of Japan)
ICT (Information and Communication Technology)
INDC (Intended Nationally Determined Contribution)
IPCC (Intergovernmental Panel on Climate Change)
ISO (International Organization for Standardization)
ITS (Intelligent Transport Systems)
JCM (Joint Crediting Mechanism)
JMA (Japan Meteorological Agency)
LED (Light Emitting Diode)
LNG (Liquefied Natural Gas)
LPAA (Lima-Paris Action Agenda)
LRT (Light Rail Transit)
METI (Ministry of Economy, Trade and Industry)
MLIT (Ministry of Land, Infrastructure, Transport and Tourism)
MOE (Ministry of the Environment)
NASA (US National Aeronautics and Space Administration)
NIES (The National Institute for Environmental Studies)
NPA (National Police Agency)
OECD (Organization for Economic Co-operation and Development)
PIIA (Public Interest Incorporated Association)
PIIF (Public Interest Incorporated Foundation)
PM (Particulate Matter)
RFA (the Railway Freight Association)
SPM (Suspended Particulate Matter)
UNCRD (United Nations Centre for Regional Development)
UNFCCC (the United Nations Framework Convention on Climate Change)
VVVF (Variable Voltage Variable Frequency)
WDCGG (World Data Centre for Greenhouse Gases)

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