2020

Transport and Environment in Japan

Publisher
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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 2020", published in March 2020 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 2019

There were a great deal of developments in 2019, 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.

Each country had to formulate its own voluntary greenhouse gas reduction targets, etc. and submit them to the convention secretariat sufficiently in advance of COP21, held in late 2015. 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 2030 compared to 2013 (25.4% reduction compared to 2005) (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.

Japan decided to become a signatory to the agreement on November 8, 2016, and presented instruments of acceptance to the Secretary-General of the United Nations on the same day.

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

The plan clarified the measures to be taken by individual entities and by the nation in order to reach the medium-term target of reducing emissions by 2030 by 26% compared to 2013 levels, laid out a roadmap for achieving these reduction targets, and stipulated a long-term target of reducing greenhouse gas emissions by 2050 by 80%.

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, on June 11, 2019, the Cabinet issued a decision titled "Japan's Long-term Strategy under the Paris Agreement," a long-term strategy for develop with low greenhouse gas emissions in accordance with the Paris Agreement, and submitted it to the convention secretariat. Additional global warming countermeasures are being implemented based on this decision.

COP25 was held in Madrid, Spain in December 2019 and although deliberation continued regarding the implementation approach to use for market mechanisms, consensus was reached regarding the promotion of ambitious climate change countermeasures to signatory countries.

All countries, along with regularly updating their goals for the reduction of greenhouse gases, will attempt to kickstart a framework from 2020 onwards for working towards reaching those goals.

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

1 Current status of global environmental problems

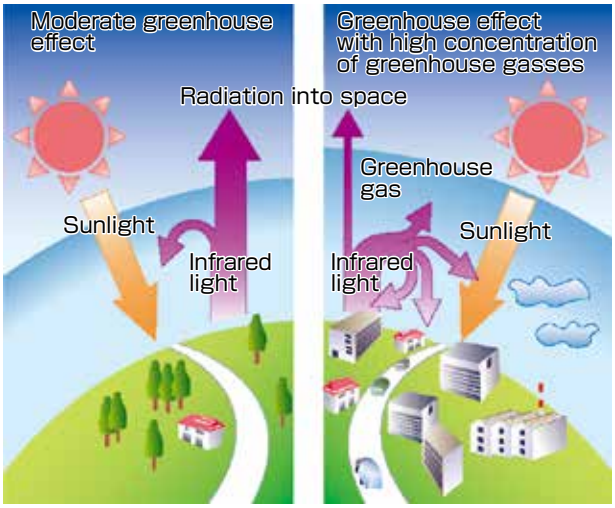
Our globe is facing severe environmental problems, such as global warming and the destruction of the ozone layer. For the next generation to receive a planet in which they can live in security, our generation must rapidly implement countermeasures to these problems.

(1) Current status of global warming

■The mechanism behind and impact of global warming

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

●Mechanism of the greenhouse effect



Atmospheric gasses such as carbon dioxide absorb a great deal of the light from the sun, as well as 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 gasses, which have kept temperatures in the range suited for life on earth, are called greenhouse gasses.

However, factors such as the rise of industry have increased the amount of daily activity, producing a rapid rise in the amount of greenhouse gasses emitted into the atmosphere. This has intensified the greenhouse effect, producing a commensurate increase in climate temperature. This is called global warming. The 5th assessment report of the Intergovernmental Panel on Climate Change (IPCC), published between 2013 and 2014, states that the average global temperature rose 0.85℃ between 1880 and 2012, and that the temperatures of every decade of the past 30 years have been warmer than any of the preceding decades since 1850. Furthermore, it states that there is no doubt that the climate system is growing warmer, and that it is highly likely that the main cause of the warming which has occurred since the mid-20th century is human activity.

Without measures to prevent global warming to counter the global growth in fossil fuel consumption, the concentration of greenhouse gasses in the atmosphere will continue to rise, resulting in further global warming. The IPCC report says it is highly likely that, in comparison to between 1986 and 2005, the average global temperature at the end of the 21st century will have risen by 0.3 to 4.8℃ , and that the average sea level will have risen by 0.26 to 0.82m. Risks resulting from the climate change include droughts, flooding, rainfall changes, food shortages, negative impacts on health, and reductions in biodiversity.

The "Paris Agreement" stipulates the controlling of rises in the average global temperature to levels that are well below 2℃ in comparison to before industrialization, along with continuing to maintain 1.5℃ . This was again summed up in 2018 by the IPCC in their "1.5℃ Special Report" . This report provides the latest scientific findings regarding the effects and risks associated with the temperature rise to 1.5℃ , along with the necessary adjustments, related emissions channels, and reduction (mitigation) of greenhouse gasses, and within the context of strengthening global efforts towards the threat of climate change, and sustainable development with the eradication of poverty.

●Forecast of increase in average global surface temperature

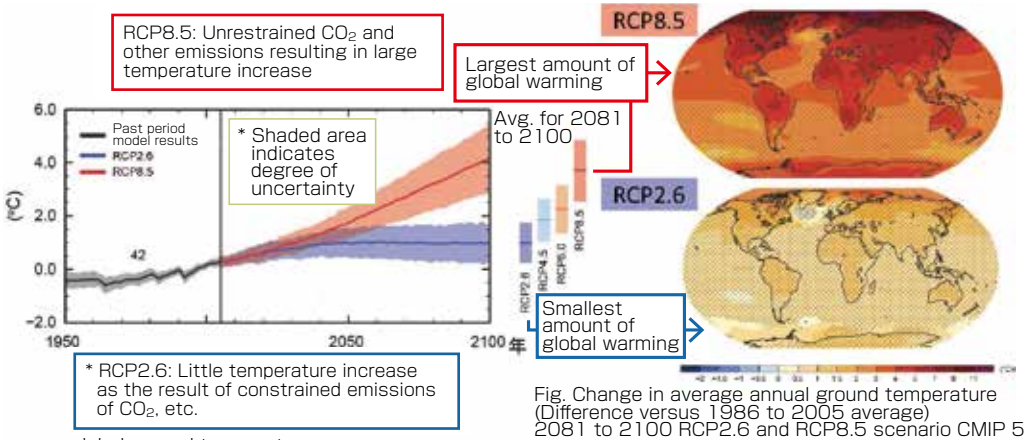


Fig. Change in average global ground temperature between 1986 and 2005
CMIP5 simulated timeline based on multiple models (1950 to 2100)
Source: Figure: IPCC AR5 WG I SPM Fig. SPM.7(a)

Fig. Change in average annual ground temperature (Difference versus 1986 to 2005 average)
2081 to 2100 RCP2.6 and RCP8.5 scenario CMIP 5 multiple model average distribution diagram

The north pole area will warm faster than the global average, and the average increase in tempertature will be greater for land areas than sea areas. (IPCC AR5 WG I SPM Fig. SPM. P.20, lines 21 to 22)

Source: Ministry of Environment (MOE) "Overview of IPCC 5th assessment" (Tentative Translated by Eco-Mo Foundation)

■Impact of individual greenhouse gasses on global warming

In addition to carbon dioxide, greenhouse gasses which cause global warming include methane, dinitrogen monoxide, and chlorofluorocarbon. According to the IPCC, the greenhouse effects per unit of volume of methane, dinitrogen monoxide, 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 2017 carbon dioxide accounted for 92% of all greenhouse gas contributions to global warming, an extremely high figure.

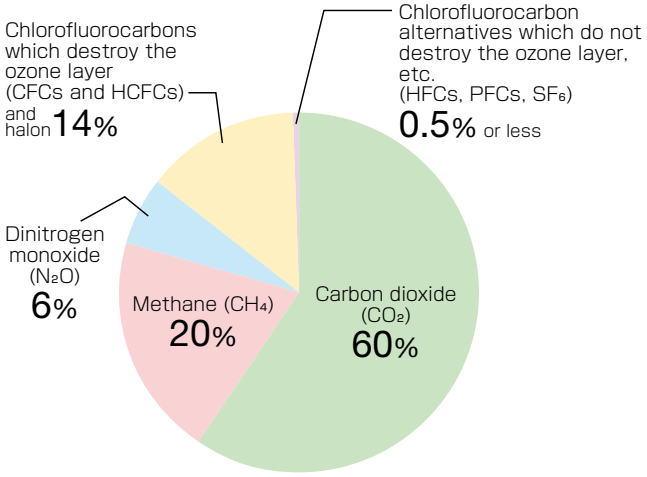
●Greenhouse gas and global warming potential (100 year period)(*1)

	Carbon dioxide	Methane	Dinitrogen monoxide	HFC(*2)	PFC(*3)	SF6
Global warming potential (100 year cumulative period)	1	25	298	1,430	9,300	22,800

*1: Global warming potential — Warming effect of greenhouse gasses 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

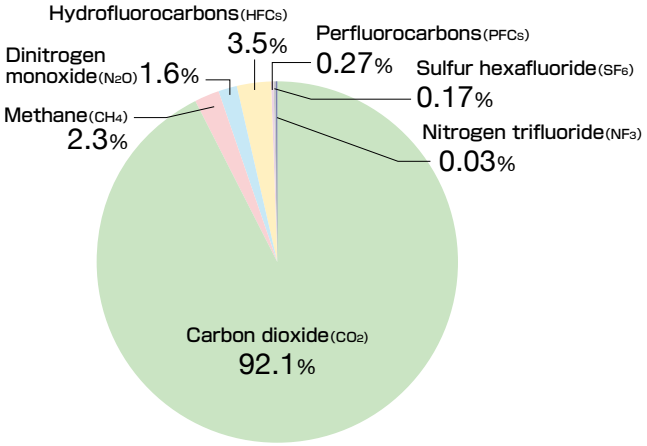
Source: IPCC (2007)

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



Source: IPCC 4th assessment report 1st working group materials (2007)

●Contributions to global warming by greenhouse gasses emitted by Japan(for 2017)



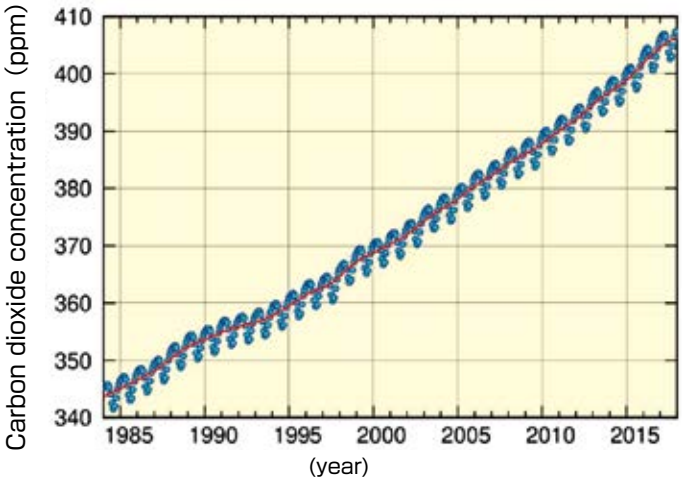
Source: GIO "Greenhouse Gas Inventory"

■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 World Data Centre for Green house Gases (WDCGG) the carbon dioxide concentration in 2017 was 405.5ppm, significantly higher than the concentration before the industrial revolution.

●The average of concentration of carbon dioxide in the atmosphere

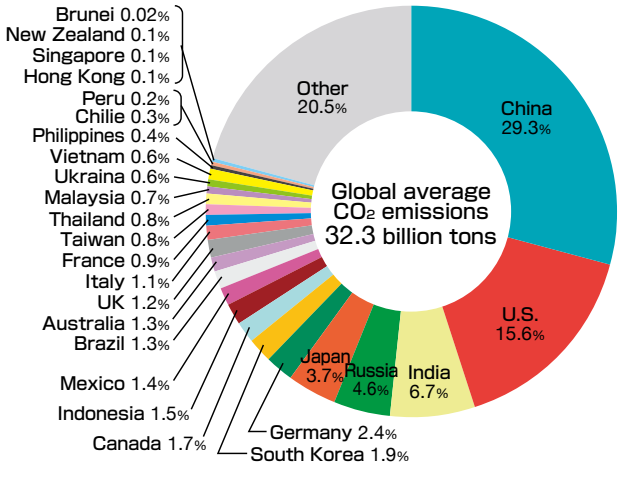


Source: Japan Meteorological Agency (JMA) "Climate Change Monitoring Report 2018" (Tentative Translated by Eco-Mo Foundation)

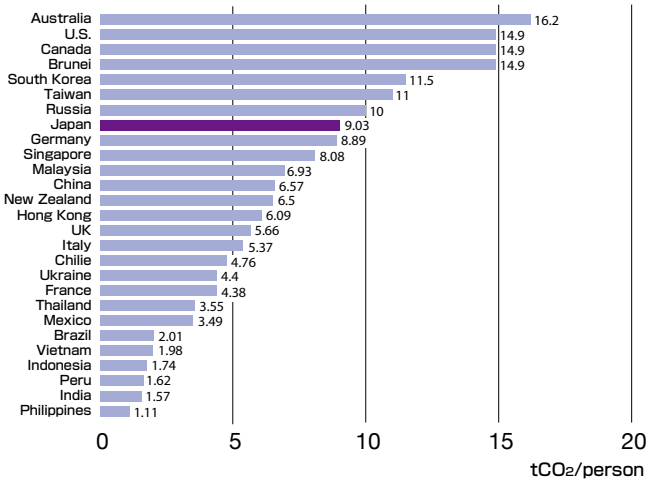
■Carbon dioxide emission volume by country

Carbon dioxide emission volume by country is as follows: China 29.3%, U.S. 15.6%, India 6.7%, Russia 4.6%, followed by Japan at 3.7%. In terms of per capita emissions by country, Japan is number 8.

●Share of carbon dioxide emission volume by country (2016)



●Per capita carbon dioxide emission volume by country (2016)



Source: EDMC "Handbook of Energy & Economic Statistics in Japan 2019"

(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 2020 the European Union (EU) and 196 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 U.N, 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.

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Japan decided to become a signatory to the agreement on November 8, 2016, and presented instruments of acceptance to the Secretary-General of the United Nations on the same day.

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.

The results of the December 2019 COP25 are shown below.

COP25, CMP15 and CMA2

December 16, 2019

From December 2nd to 15th, in Madrid, Spain, the 25th session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP25), the 15th session of the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol (CMP15), and the 2nd session of the Conference of the Parties serving as the Meeting of the Parties to the Paris Agreement (CMA2), as well as the 51st session of the Subsidiary Body for Implementation (SBI51) and the Subsidiary Body for Scientific and Technological Advice (SBSTA51), were held respectively, as summarized in the following outline. The Government of Japan was represented by H.E. Mr. KOIZUMI Shinjiro, Minister of the Environment, accompanied by officials of the Ministry of Foreign Affairs, the Ministry of Economy, Trade and Industry, the Ministry of the Environment, the Ministry of Finance, the Ministry of Education, Culture, Sports, Science and Technology, the Ministry of Agriculture, Forestry and Fisheries, and the Ministry of Land, Infrastructure, Transport and Tourism, who participated in the conferences.

The Government of Japan contributed to the negotiations for Article 6 of the Paris Agreement (market mechanisms) and other agenda, with Minister Koizumi leading the discussions through intensive participations in bilateral and ministerial consultations, in addition to technical negotiations attended by Heads of Delegation and expert-level officials.

Furthermore, during the conferences, Japan proactively delivered its achievements and efforts, including the record of five-year-consecutive reductions in GHG emissions as well as active commitments by non-state actors.

1. Summary of the negotiations

(1) Article 6 of the Paris Agreement (market mechanisms)

The negotiations for implementation guidelines for market mechanisms, whose agreement had not been reached at COP24, became one of the highlights at COP25. The Government of Japan called for the avoidance of double-counting of emission reductions and securing environmental integrity. Minister Koizumi held intensive bilateral consultations with other Ministers and took the lead in the ministerial negotiations with constructive proposals, added by technical negotiations attended by Heads of Delegations and expert-level officials. On the other hand, under this agenda item, due to political aspects with complicated interest of each country, it was not possible to reach agreement on all discussion items. On the basis of the progress attained through discussions at COP25, the Government of Japan on its part will continue to contribute towards the adoption of the implementation guidelines for market mechanisms at COP26.

(2) Loss and Damage (loss and damage associated with the adverse effect of climate change)

The review was held for the Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts, which was established at COP19 under the United Nations Framework Convention on Climate Change (Convention). As some countries claimed to request the Green Climate Fund (GCF) to provide support for loss and damage, it was decided that within the existing frameworks considerations will continue. It was also agreed to establish the expert group to support activities for loss and damage and the Santiago Network to catalyze technical assistance regarding loss and damage.

(3) Other discussions

Discussions were held on a broad range of negotiation agendas including the periodic review of the long-term global goal under the Convention, climate finance, reporting formats under the transparency frameworks (reporting systems for Parties to the Paris Agreement), gender and climate change, Impacts of implementation of response measures (social and economic impacts arising from the implementation of mitigation policies and actions), adaptation, development and transfer of technologies, capacity building, agriculture, research and systematic observation. The outcome of the discussions includes the decision on the scope of the next periodic review of the long-term global goal under the Convention, enhanced Lima work programme on gender and its gender action plan, and the 6-year workplan of the forum on the impact of the implementation of response measures.

(4) Decisions by COP, CMP and CMA (Chile Madrid Time for Action)

In addition to the above-mentioned agenda items, discussions were held on elements to be included in decisions by COP, CMP and CMA respectively. As a result of the negotiations, the decisions included texts to enhance ambitious climate change measures by all Parties, and to convene a dialogue on ocean and climate change in June, 2020. The next COP26 will also be held in November, 2020 in the United Kingdom.

(5) Minister Koizumi's bilateral meetings with other Minister-level delegates

Minister Koizumi held a total of 36 bilateral meetings with Ministers/Representatives of 13 countries/regions and with heads of four organizations, including Chile (COP25 Presidency), Costa Rica, Brazil, European Union, France, Germany, South Africa, Singapore, New Zealand, and United Nations Secretary-General António Guterres as well as UN Climate Change Executive Secretary Patricia Espinosa. Throughout the meetings, Minister Koizumi took the lead in negotiations for implementation guidelines for market mechanism and exchanged views on various points including vision and actions regarding climate change.

2. Promotion of Action by Japan

(1) High-level events

(a) Statement by Minister Koizumi at the Ministerial Meeting

Minister Koizumi first and foremost made clear Japan's firm position on negotiations for market mechanisms under Article 6 of the Paris Agreement, instruments for accelerating global emissions reductions, that the implementation guidelines shall be adopted to avoid double counting and secure environmental integrity.

Furthermore, Minister Koizumi promoted Japan's efforts and ideas for climate change most effectively as the following:

・as one of the youngest Ministers in the world as well as the oldest of the millennial generation, listening to youth voices and securing the future;

・while yet to a new development on our coal-related policy by COP25, taking appropriate note of criticisms and continuing to take concrete actions toward decarbonization and delivering the results;

・trying to change the current perception where Japan's actions are being overshadowed by criticism to its coal policy and are not well received; Japan is fully committed to decarbonization and Japan will realize it;

・since taking office as Minister of the Environment in September this year, increased the number of local governments

with the net-zero declaration by 2050 from 4 to 28, equivalent to the population of 45 million – such ambitious actions by local governments expected to create a great force in accelerating the nation-wide net zero achievement by Japan;
・emphasizing that the number of companies and institutions supporting TCFD recommendations in Japan is the largest in the world, which is attracting more investment with proper disclosure of climate related information;
・supporting the Green Climate Fund as a leading donor.

(b) Ministerial Dialogue on Adaptation
The Government of Chile convened the "Ministerial Dialogue on Adaptation Ambition" to discuss raising ambitions and share examples of efforts by respective countries. H.E. Ms. Carolina Schmidt, Minister of the Environment, Chile, and H.E. Teresa Ribera, Minister for the Ecological Transition, Spain chaired the dialogue. Prime Ministers/Ministers of four countries including Minister Koizumi, delivered remarks and held panel discussions.
Minister Koizumi explained the Climate Change Adaptation Act, which come into force in December last year in Japan, the establishment of "Asia-Pacific Climate Change Adaptation Information Platform" (AP-PLAT) to support the Asia Pacific region in science-based adaptation actions.

(c) Global Climate Action (GCA) Plenary Event
A GCA event was convened to share actions and achievement against climate change undertaken by Contracting Parties and non-state actors. From Japan, Mr. MORISHITA Satoru, Vice-Minister for Global Environmental Affairs, Ministry of the Environment, explained actions taken by local governments and private companies in Japan and highlighted that Japan timely included decarbonization in its long-term strategy under the Paris Agreement.

(2) Official side events and others

(a) GCF
Minister Koizumi announced Japan's contributions as the leading donor. Furthermore, Minister Koizumi explained Japan's efforts toward the increase in ESG finance and the expansion of green bond markets in Japan. Lastly, Minister Koizumi asked GCF to put forward initiatives such as "GCF for Youth" in order to backup actions by the youth.

(b) Carbon Neutrality Coalition Ministerial Event at COP25
Under the chair of Ms. Laurence Tubiana, former Ambassador in charge of the negotiations on climate change of France, the meeting was also attended by H.E. Mr. Josaia Voreqe Bainimarama, Prime Minister of Fiji, H.E. Mr. James Shaw, Minister for Climate Change of New Zealand, H.E. Mr. Carlos Manuel Rodriguez, Minister of Environment and Energy of Costa Rica and H.E. Mr. Myung Rae Cho, Minister of Environment of the Republic of Korea. Minister Koizumi stated that Japan is the first G7 member to declare carbon neutrality in the long-term strategy under the Paris Agreement, non-state actors such as local governments and private sectors are accelerating actions and the Circular Economy Business Forum to be held in Tokyo plans to have a session for the Carbon Neutrality Coalition. In response, the Republic of Korea, which on this occasion announced its intent of participation in the Coalition, expressed its appreciation for the support extended by Minister Koizumi for its participation in the Coalition.

(c) Workshop at the United Nations SDG Pavilion
The workshop was held to discuss collaboration of efforts toward climate change measures and the achievement of SDGs. Minister Koizumi announced that: Japan will, in collaboration with the World Economy Forum (WEF), convene the Circular Economy Business Forum around in May next year; coordinated actions based on the "Osaka Blue Ocean Vision" agreed at G20 Summit this year are necessary; Japan will host an international conference on climate change and disaster prevention in collaboration with the UN organizations; and Japan offered to host the third Climate and SDGs Synergy Conference in 2021.

(3) Side events at the Japan Pavilion
The Japan Pavilion at COP25 venue featured various exhibitions and seminars. Under the theme of "ACTION. ACTION. ACTION." Japan showcased its strength centering on hydrogen technologies, space/ocean observation, measures against fluorocarbons, and wind power generation technologies, and covering both aspects of mitigation and adaptation, exhibited models/dioramas/panels with their images. Furthermore, as the side-events, Japan delivered its various efforts to contribute to the global decarbonization with concrete actions. The following is the summary of major events:

(a) Initiative on Fluorocarbons Life Cycle Management
Minister Koizumi declared to launch the Initiative on Fluorocarbons Life Cycle Management, on the occasion of the establishment ceremony for the initiative convened by the Government of Japan. France, Chile, Maldives, Asian Development Bank (ADB) and Climate and Clean Air Coalition (CCAC) voiced support for the initiative. (As of now, 11 countries and international organizations as well as 10 companies and bodies in Japan have expressed support.)

(b) Osaka Blue Ocean Vision
The roundtable for the Osaka Blue Ocean Vision was held. Minister Koizumi shared the Osaka Blue Ocean Vision with Ministers and senior officials of countries including 8 countries other than members of G20. Participating countries expressed their determination for measures against marine plastic liter.

(c) Climate Change and Disaster Prevention
Japan hosted an event for climate change and disaster prevention, at which Minister Koizumi appealed Japan's efforts based on the Climate Change Adaptation Act, support for the promotion of highly effective adaptation actives through the Asia-Pacific Climate Change Information Platform (AP-PLAT) launched in June this year, the plan to host the Asia-Pacific Adaptation Network (APAN) Forum in September next year.

(d) Innovation Challenge for Net Zero Carbon
KEIDANREN (Japan Business Federation) held an event for roles of innovation towards net zero carbon. Minister Koizumi attended to welcome the "Challenge Zero" by KEIDANREN and introduced actions by Japanese corporations and actions by local governments as "Zero Carbon Companies" and "Zero Carbon Cities" respectively, Furthermore, Minister Koizumi commemorated the recent Nobel Prize awarded to Dr. Yoshino Akira for his contribution to lithium-ion batteries and highlighted Japan's utmost contribution through innovation and international cooperation towards global-scale carbon neutrality.

(4) Other Events
On the occasion of the Earth Information Day, Japan presented the latest findings of its climate change projection research programmes and highlighted the importance of systematic observation related to the climate system.

Source: Ministry of Foreign Affairs of Japan website

(3) Current status of global warming issues in Japan

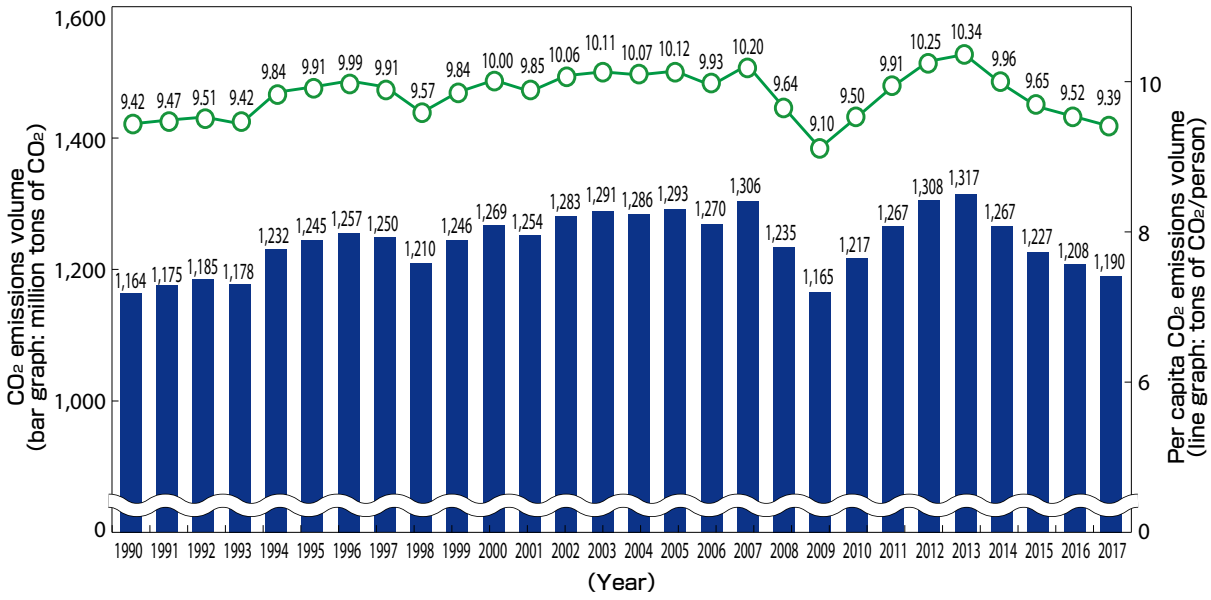
①Current status of carbon dioxide emissions in Japan

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 2017 Japan emitted approximately 1,190 million tons of carbon dioxide, roughly 2.3% more than it did in 1990. The per capita emissions volume in 2017 was approximately 9.39 tons.

●Trends in carbon dioxide emissions in Japan

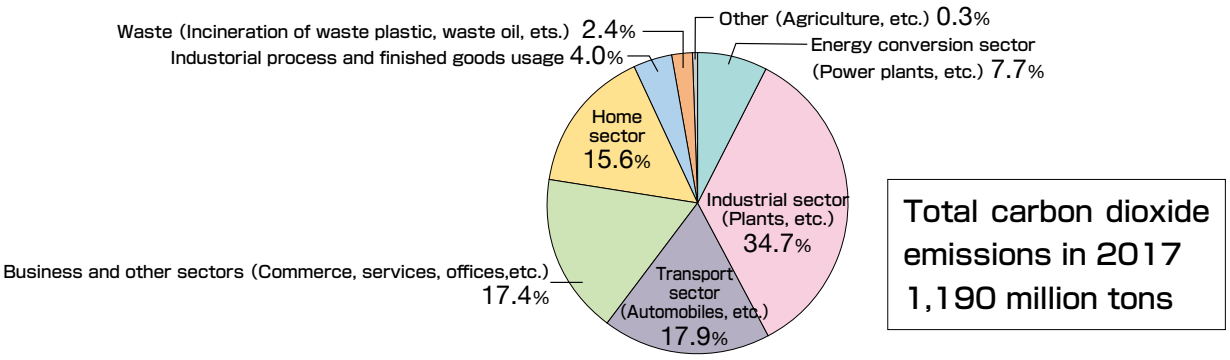


Source: GIO "Greenhouse Gas Inventory"

■Ratio of carbon dioxide emissions in Japan by sector

The industrial sector accounts for 34.7% of Japan's carbon dioxide emissions, the transport sector for 17.9%, business and other sectors account for 17.4%, and the home sector accounts for 15.6%.

●Amount of carbon dioxide emissions in Japan (by sector) 2017



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 2005. In 2011 the focus on energy conservation following the Great East Japan Earthquake brought about another decline in final energy consumption. Real GDP rose by 1.9% year-on-year in 2017, and due to increased heating demand caused by the cold winter compared to the previous year, final energy consumption rose for the first time in seven years, by 0.4%.

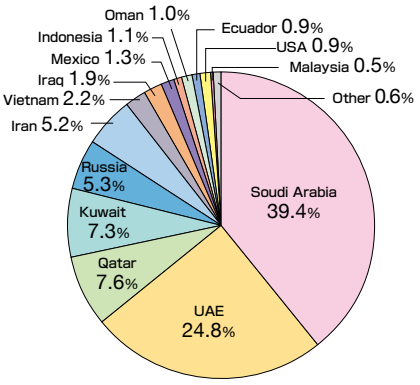
Looking at energy consumption trends from 1973 to 2017, energy consumption for the company and business sector grew 1.0-fold (0.9-fold for the industrial sector and 2.1-fold for the business and other sectors), 2.0-fold for the home sector, and 1.7-fold for the transport sector.Since the first oil crisis, the company and business sectors, 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 has seen greatly increase in energy consumption because of the spread of energy equipment and automobile. As a result, while the company and business establishment, the home, and the transport sectors accounted, respectively, for 74.7%, 8.9%, and 16.4% of total energy consumption in 1973, in 2016 these ratios had changed to 62.2%, 14.4%, and 23.4% respectively.

■Dependence on petroleum for energy consumed in Japan

Japan's supply of petroleum as a primary energy source fell as the result of petroleum replacement policies and energy saving measures implemented in response to the oil crises, but began rising from the late 1980s due to easy energy saving measures having taken their course and falling crude oil prices. From the mid-1990s onwards the development of alternative energy sources, etc. caused petroleum use to decline. As of 2017, the energy equivalent of the petroleum supply is 7,837 PJ.

From the 1970s to 2017, Japan's crude self-sufficiency ratio has been below 0.5%. The fifth Basic Energy Plan, revised in July 2018, clearly indicated that the crude oil supply structure, which is highly dependent on overseas suppliers for energy resources, is a structural problem that affects Japan's energy supply. Japan imports oil from Middle Eastern countries such as Saudi Arabia, the United Arab Emirates, Qatar, Kuwait , Iran, Iraq, and Oman. These account for roughly 87% of Japan's total oil imports.

●Crude oil imports by supplying country (2017)



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

(Source: METI "Energy White Paper 2019" (Tentative Translated by Eco-Mo Foundation))

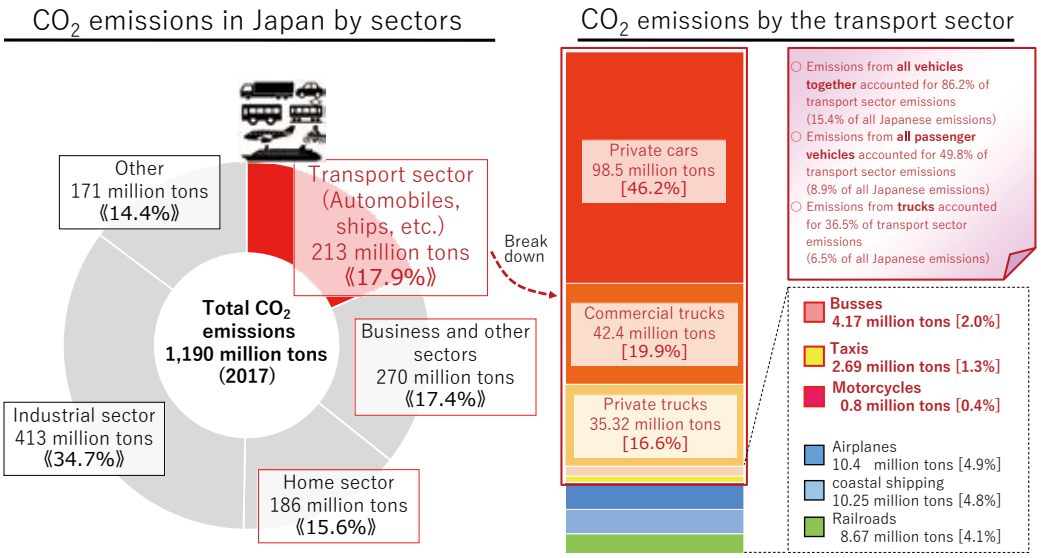
(4) Current status of global warming issues in the transport sector

①Current status of carbon dioxide emissions by the transport sector

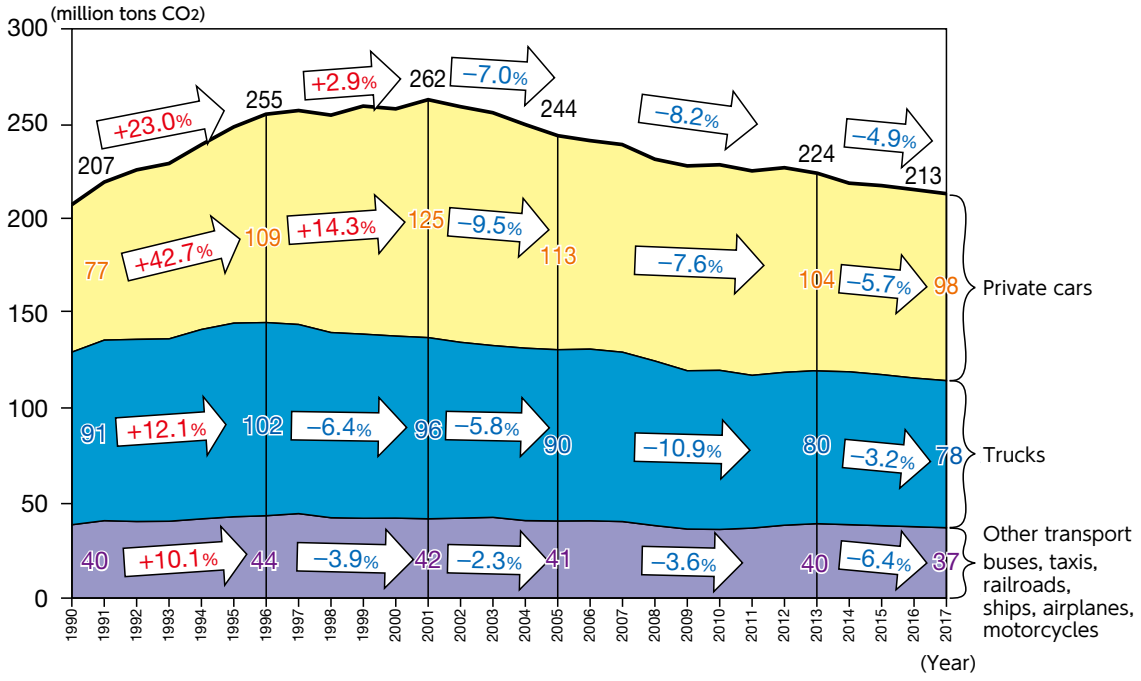
■Trends in carbon dioxide emissions by the transport sector

Japan's total carbon dioxide emissions in 2017 (1,190 million tons), emissions from the transport sector accounted for 17.9% (213 million tons). Emissions from all vehicles together accounted for 86.2% of the transport sector emissions (15.4% of Japan's total emissions), emissions from all passenger vehicles accounted for 49.8% of the transport sector emissions (8.9% of Japan's total emissions), and emissions from trucks accounted for 36.5% of the transport sector emissions (6.5% 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 (1990 to 2017) "
※ Motorcycles were included in "Business and other sectors" until 2015 data, but was calculated as an independent item in the transport sector from 2016 data.



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

From 1990 to 1996 the amount of carbon dioxide emitted by the transport sector rose by 23.0%, but from 1997 to 2001 emissions remained roughly level, and began falling from 2001 onwards.

In 2017 the amount of carbon dioxide emissions was lower than in both 2005 and 2013, due in part to fuel efficiency improvements. Furthermore, the reduction in emissions from passenger vehicles other than private vehicles (company vehicles, etc.) caused emissions to fall year-on-year for the fifth consecutive year.

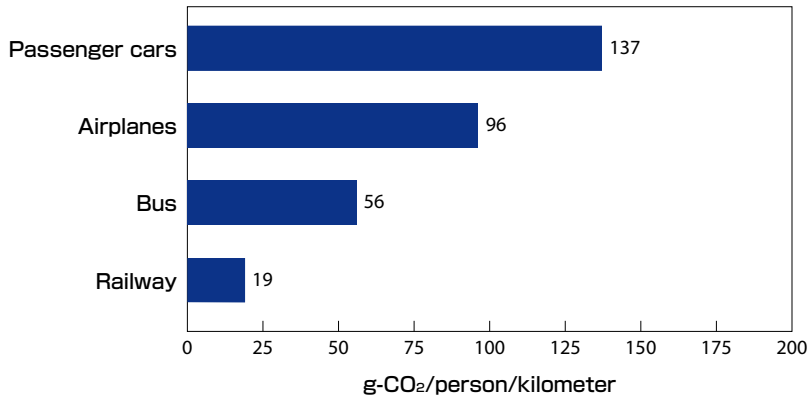
■Carbon dioxide emission volume per unit of traffic volume

Generally speaking, when the traffic volume increases, so does the amount of carbon dioxide emissions. Traffic 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 traffic volume, it is important to promote highly effective transport.

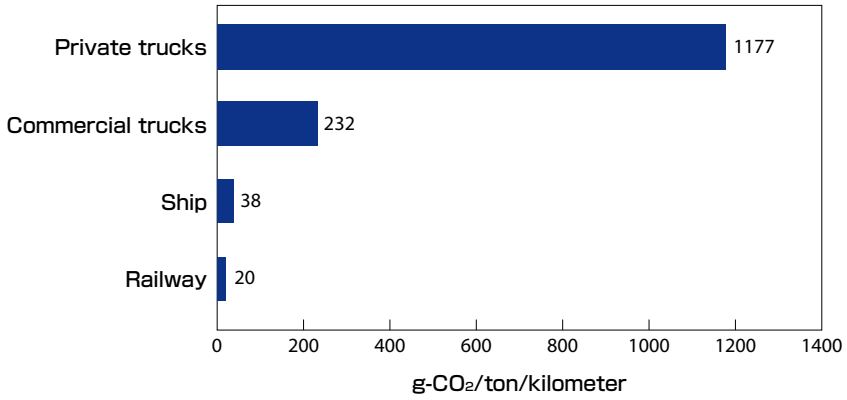
In this section, we compare the amount of emissions per unit of traffic volume, an indicator of efficiency, for passenger transport and freight transport.

For passenger transport, the carbon dioxide emissions from each type of transport are divided by the traffic volume (person-kilometers: the number of transported people multiplied by the distance transported) to calculate the carbon dioxide emissions per unit of traffic volume. The results are shown in the figure below.

●Carbon dioxide emission rates by passenger transport mode (2017)

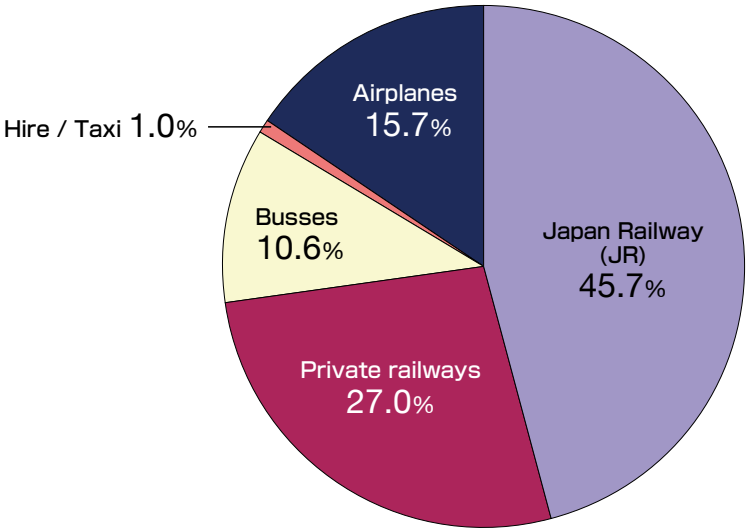


●Carbon dioxide emission rates by freight transport mode (2017)



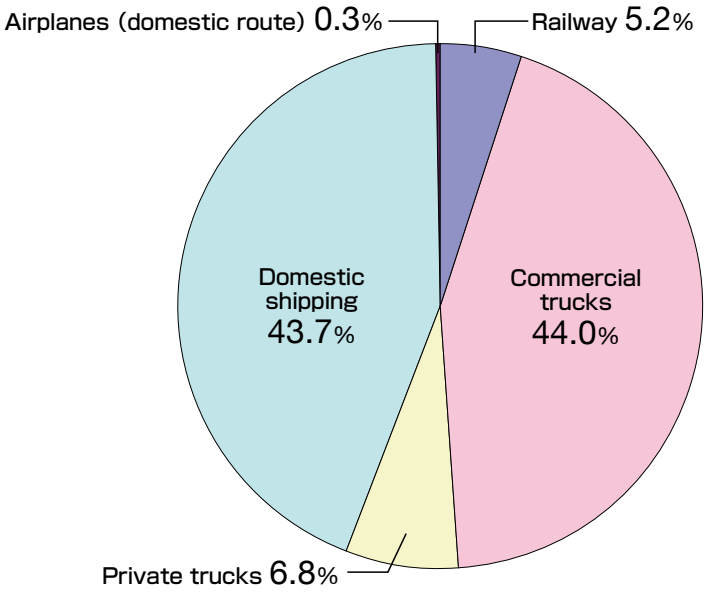
Source: MLIT website (Tentative Translated by Eco-Mo Foundation)

●Modal shares of domestic passenger transport (100 million person・km), 2017



*1 The air transport volume percentage is the total of both regular and irregular service.
*2 The passenger vehicle, etc., percentage includes both light-vehicle and truck transport.
*3 The bus and hire/taxi, 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), 2017



*1 The air transport percentage is the total of both regular and irregular service, 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.

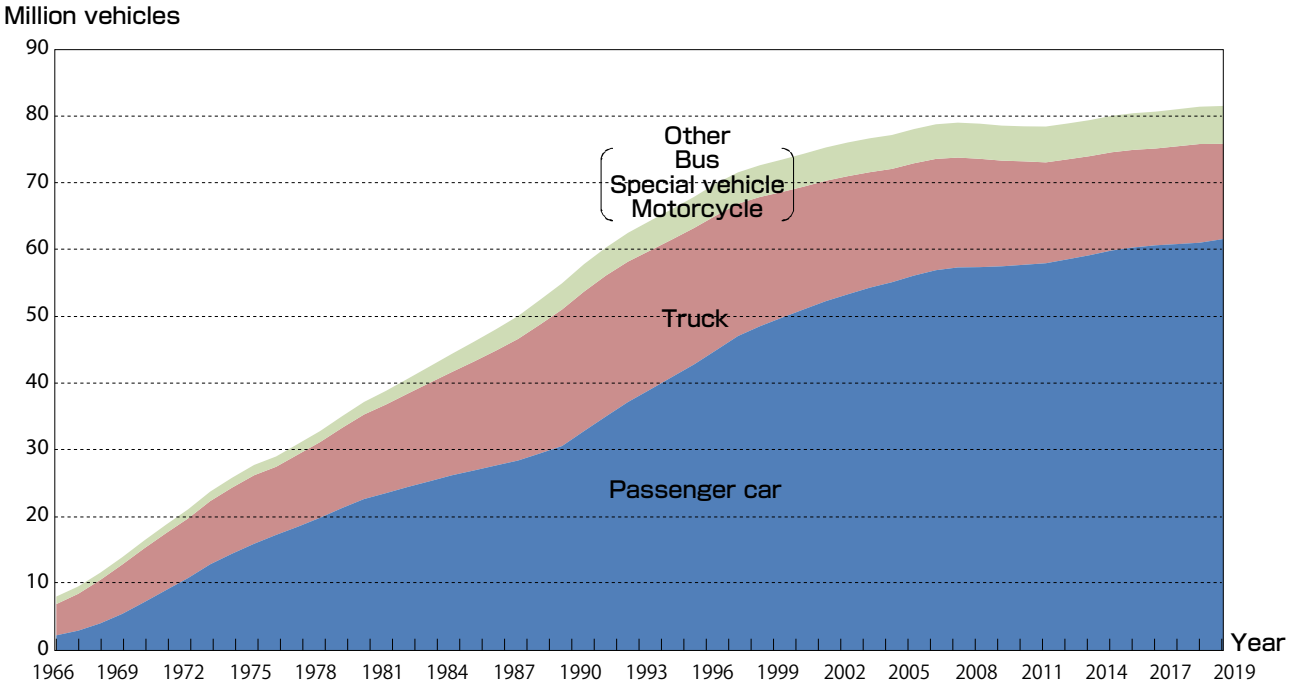
Source: MLIT "White Paper on Land, Infrastructure, Transport and Tourism in Japan 2019" (Tentative Translated by Eco-Mo Foundation)

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 has brought about a reduction in carbon dioxide emissions by the transport sector. Emissions in 2017 were 213 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 include mini-vehicles.
2: Number of vehicles as of the end of March of each year.

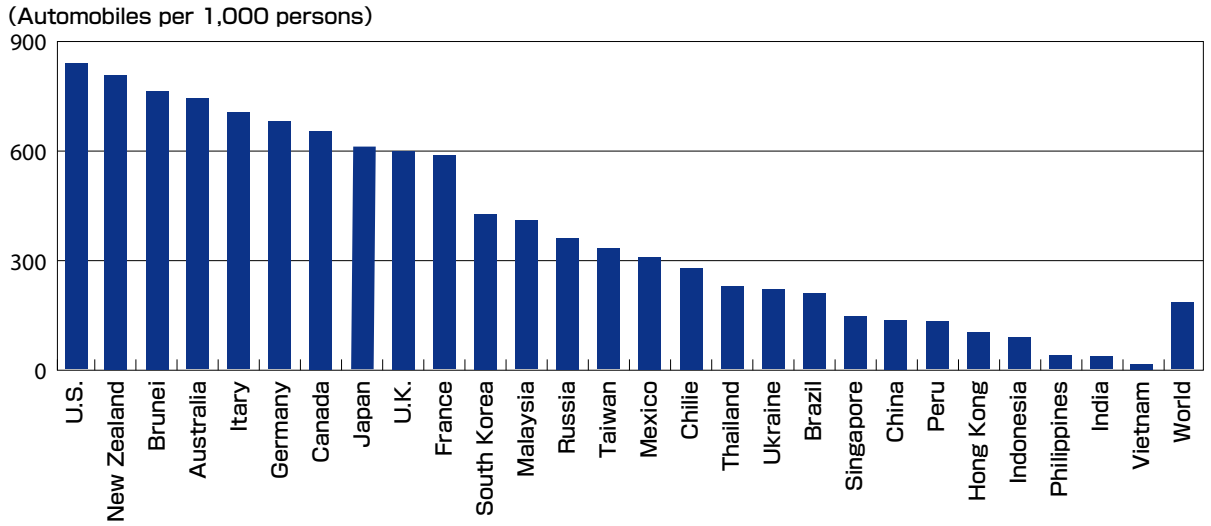
Source: Automobile Inspection & Registration Information Association website (Tentative Translated by Eco-Mo Foundation)

Column

Automobile ownership rates around the World

In terms of automobile ownership per thousand people, the U.S. has the world's highest automobiles ownership rate, at 837 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 3.4% globally in 2016, but in China it grew by 13.4%, and in India by 9.1%. Automobiles ownership in these countries, with their 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 2016



Source: EDMC "Handbook of Energy & Economic Statistics in Japan 2019"

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 2017 air quality standards achievement rates for NO_2, with 100% achievement rates for twelve consecutive years since 2006. Automobile exhaust gas monitoring stations *2 have remained at the same levels as 2016, at 99.7%. For automobile exhaust gas monitoring stations in areas implementing Automobile NOx/PM Act measures the achievement rate was 99.5%.

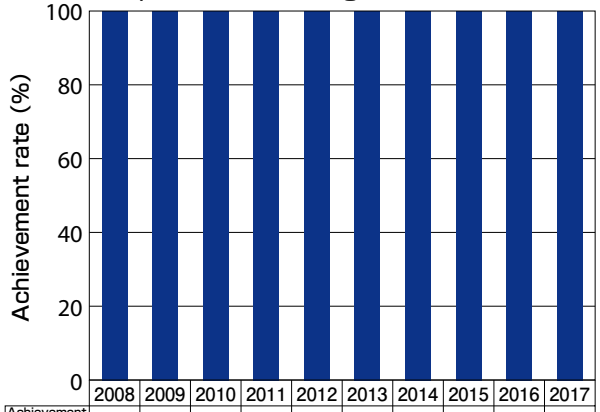
For SPMs, nationwide 2017 air quality standards achievement rates were 99.8% for air pollution monitoring stations and 100% for automobile exhaust gas monitoring stations. These have stayed roughly level for both types of stations in comparison to 2016 (air pollution monitoring station: 100%, automobile exhaust gas monitoring station: 100%). SPM 2017 air quality standards achievement rates for areas implementing Automobile NOx/PM Act measures remained level at 100% for both air pollution monitoring stations.

＊1 Air pollution monitoring station:
Monitoring stations performing regular monitoring of general atmospheric pollution conditions. (Nationwide: 1,464 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: 409 stations)

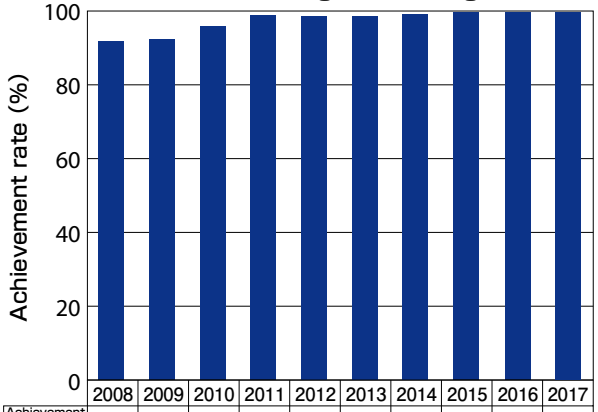
●NO_2 air quality standards achievement rates in regions implementing Automobile NOx/PM Act measures (2008 to 2017)

(Air pollution monitoring stations)



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Achievement rate	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
No. of effective stations	436	438	411	425	418	411	413	407	403	401
No. of achieving stations	436	438	411	425	418	411	413	407	403	401

(Automobile exhaust gas monitoring stations)

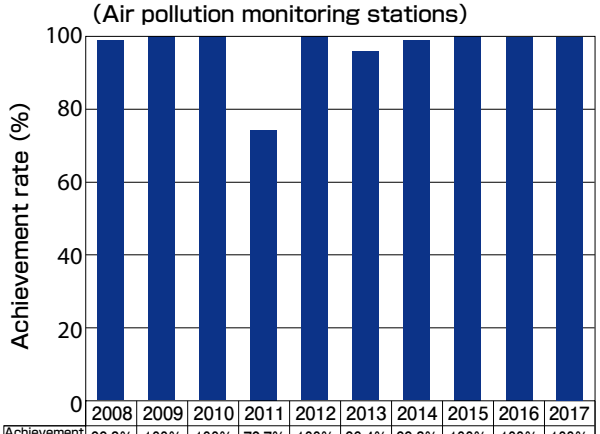


	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Achievement rate	92.0%	92.9%	95.7%	99.1%	98.6%	98.6%	99.1%	99.5%	99.5%	99.5%
No. of effective stations	225	226	207	219	216	218	216	217	215	212
No. of achieving stations	207	210	198	217	213	215	214	216	214	211

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

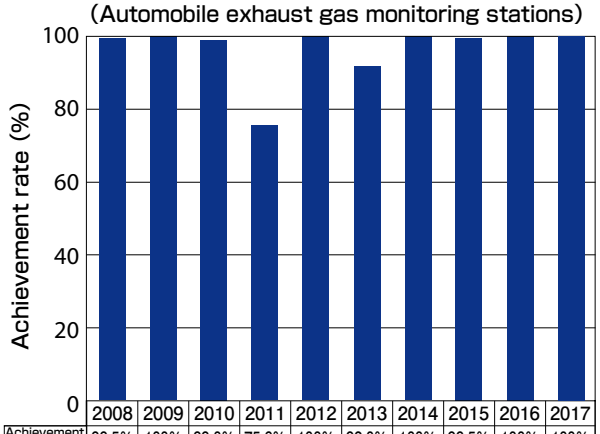
●SPM air quality standards achievement rates in regions implementing Automobile NOx/PM Act measures (2008 to 2017)

(Air pollution monitoring stations)



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Achievement rate	99.8%	100%	100%	72.7%	100%	96.4%	99.8%	100%	100%	100%
No. of effective stations	440	439	415	429	421	415	415	413	412	409
No. of achieving stations	439	439	415	312	421	400	414	413	412	409

(Automobile exhaust gas monitoring stations)



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Achievement rate	99.5%	100%	99.0%	75.6%	100%	92.0%	100%	99.5%	100%	100%
No. of effective stations	213	214	197	209	207	209	208	210	208	203
No. of achieving stations	212	214	195	158	207	193	208	209	208	203

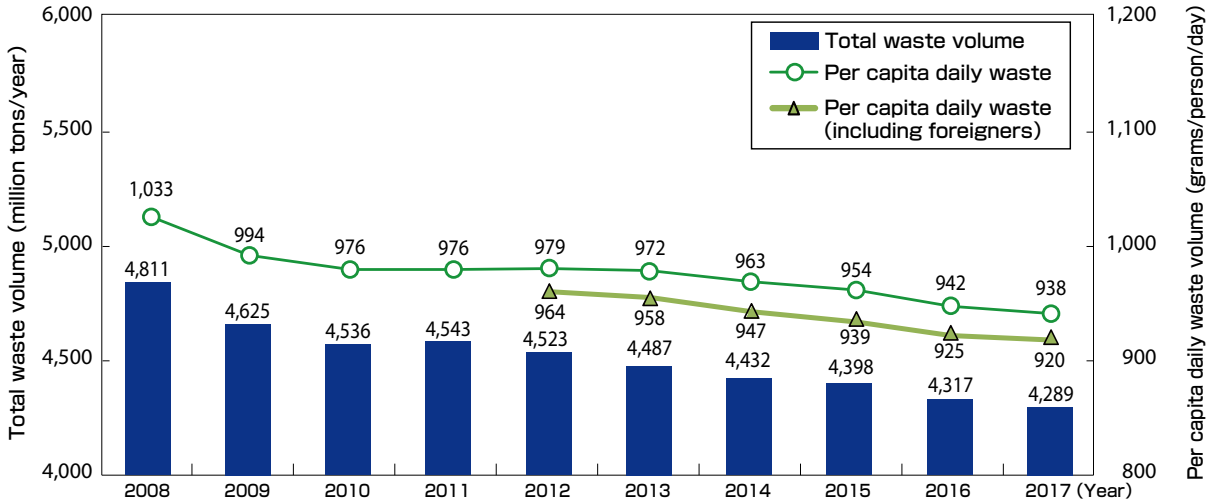
Source: MOE website (Tentative Translated by Eco-Mo Foundation)

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 1979, but began rising rapidly from roughly 1985. From 1990 they leveled off or increased slightly, but began falling from 2001. In 2017 the total amount of waste was 42.89 million tons. The total amount of recycled waste in 2017 was 8.79 million tons. The ratio of total waste which was recycled has grown tremendously, from 5.3% in 1990 to 20.3% in 2017.

●Total waste volume and per capita daily waste volume

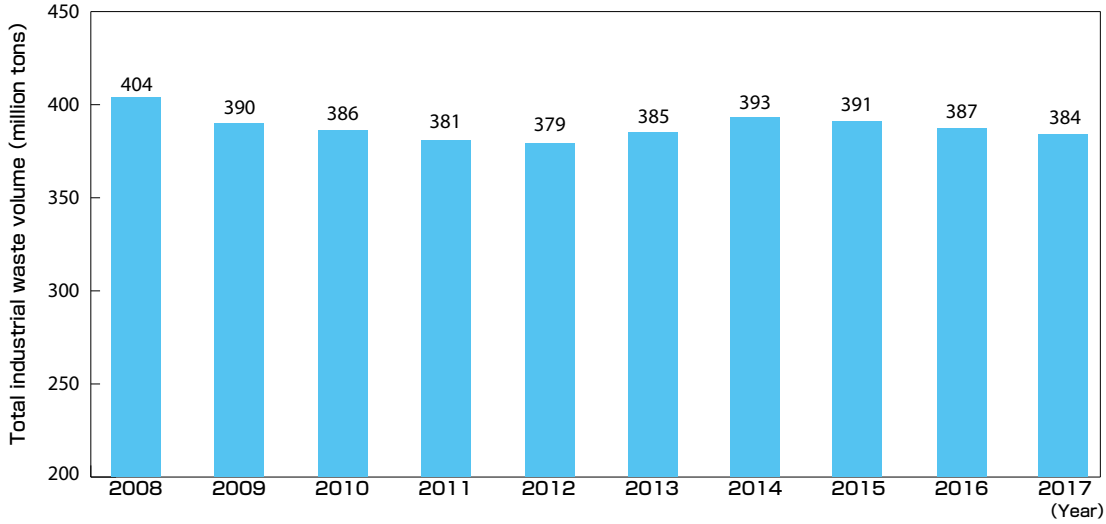


Source: MOE website (Tentative Translated by Eco-Mo Foundation)

②Trends in industrial waste volume

The amount of industrial waste produced has stayed roughly at the same level since the 1990s at approximately 400 million tons.

●Industrial waste volume



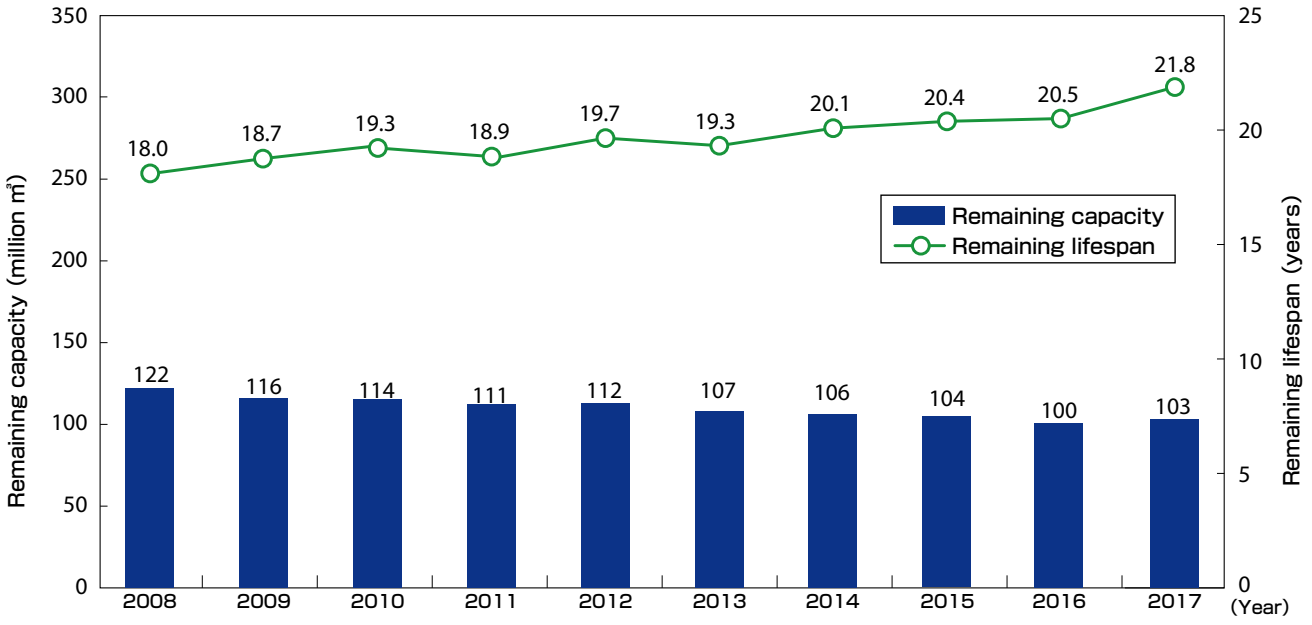
Source: MOE website (Tentative Translated by Eco-Mo Foundation)

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

As of the end of 2017 there were 1,651 general waste final disposal sites in Japan with a remaining capacity of 102.87 million m³. The average remaining lifespan was 21.8 years. The remaining capacity remains roughly same level, while the remaining lifespan is increasing.

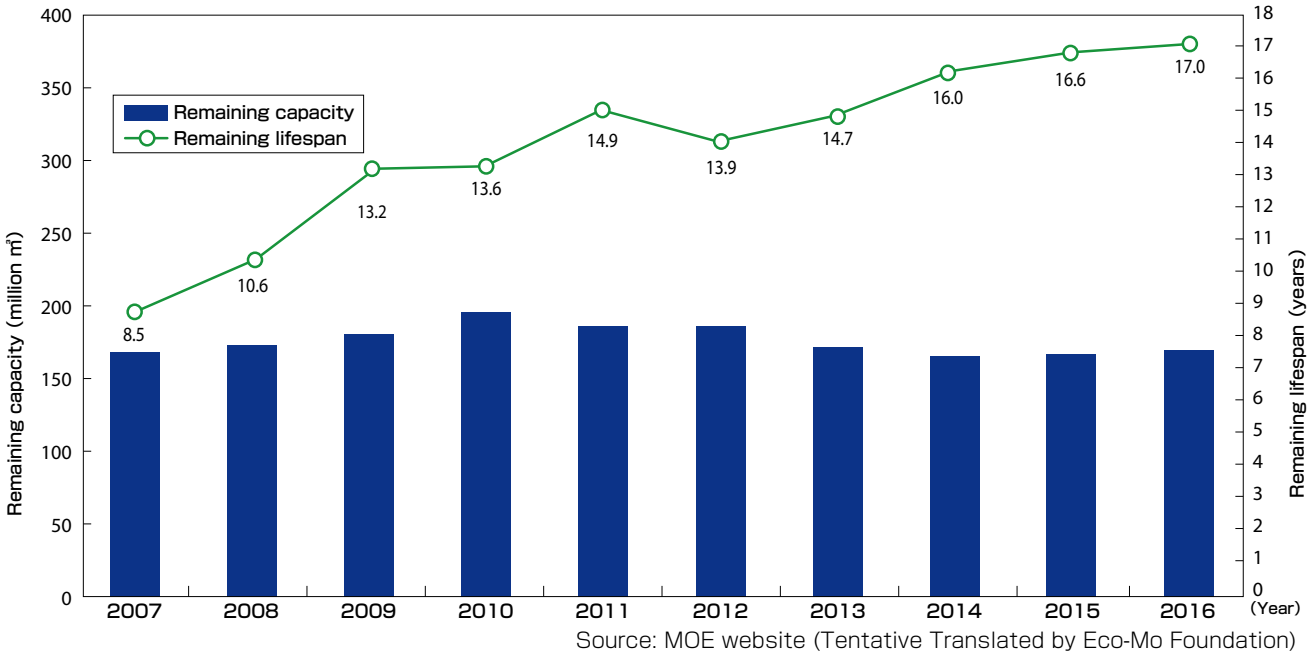
The remaining capacity of industrial waste final disposal sites as of the end of 2016 was 167.77 million m³, 0.41 million m³ more than the previous year. The average nationwide remaining lifespan is 17.0 years. Slight improvements are being made, but the remaining lifespan in the Tokyo area is 5.6 years, and remaining capacities are particularly low for major metropolitan areas.

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



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

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

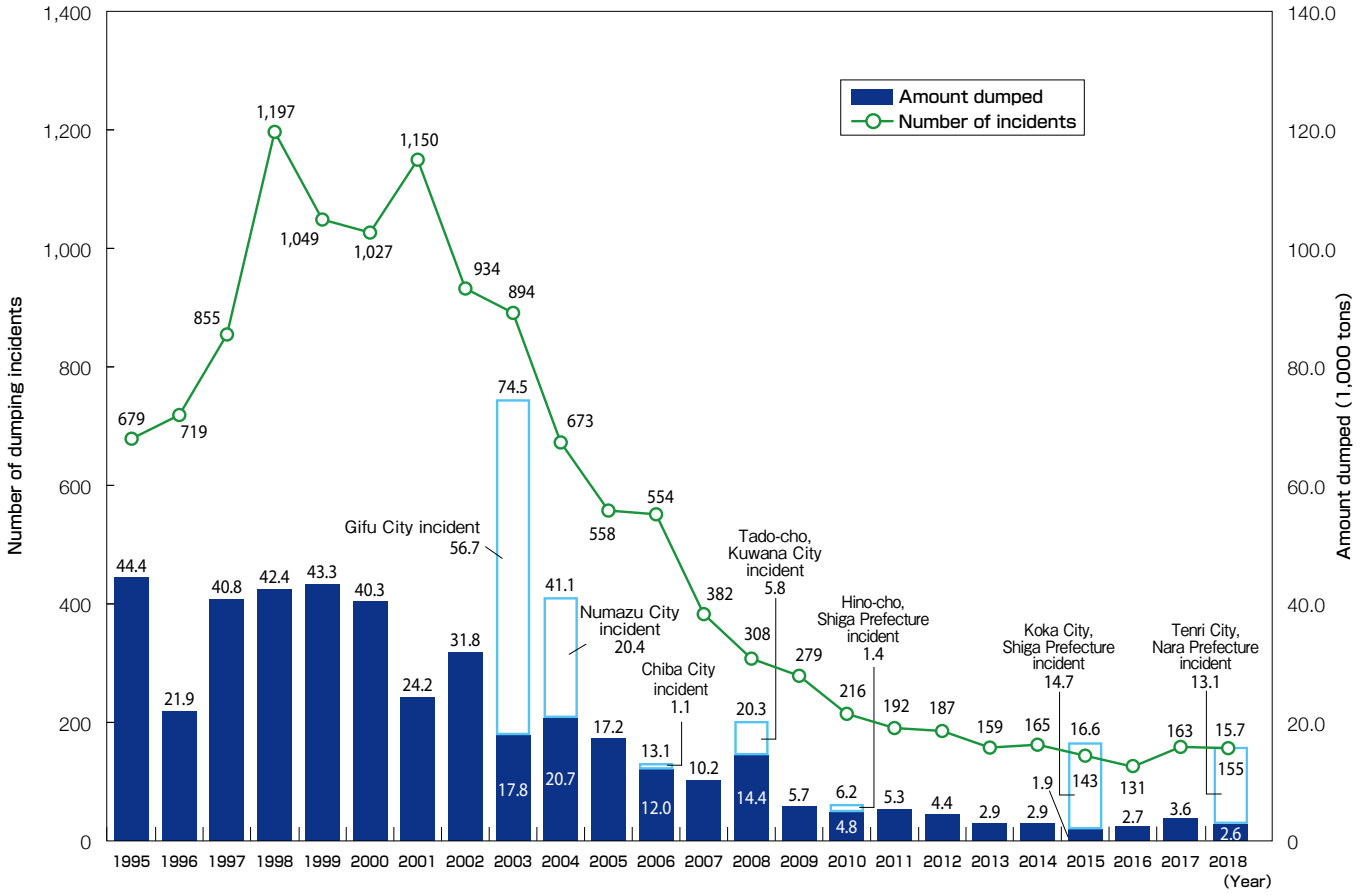


Source: MOE website (Tentative Translated by Eco-Mo Foundation)

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

155 incidents of illegal dumping of industrial waste, a total of 157,000 tons of waste, were discovered in 2018, along with 148 incidents of improper disposal (52,000 tons). Newly discovered cases of illegal dumping decreased considerably and steady results are being observed. Regarding improper disposal, new incidents were discovered in 2018; thus, elimination thereof has not yet been achieved.

●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. With regards to the white areas of the bar graph, the incidents discovered in Gifu City in 2003 and in Numazu City in 2004 took place over multiple preceding years, resulting in the discoveries of major volumes of illegally dumped waste in the respective years. The white area of the bar graph corresponding to the 2006 Chiba City incident indicates an incident which was discovered in 1998 but was reported in 2006. The white area of the bar graph corresponding to the 2008 Tado-cho, Kuwana City incident indicates an incident which was discovered in 2006 but was reported in 2008. The white area of the bar graph corresponding to the 2010 Hino-cho, Shiga Prefecture incident indicates an incident which was discovered in 2009 but was reported in 2010.
   As for 2015, incidents of Koka city, Shiga Prefecture and Ube City, Yamaguchi Prefecture, and Kuji City, Iwate Prefecture are reported as major incident.
3. The sulfuric acid pitch were not included in this study and are covered separately.
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 Translated by Eco-Mo Foundation)

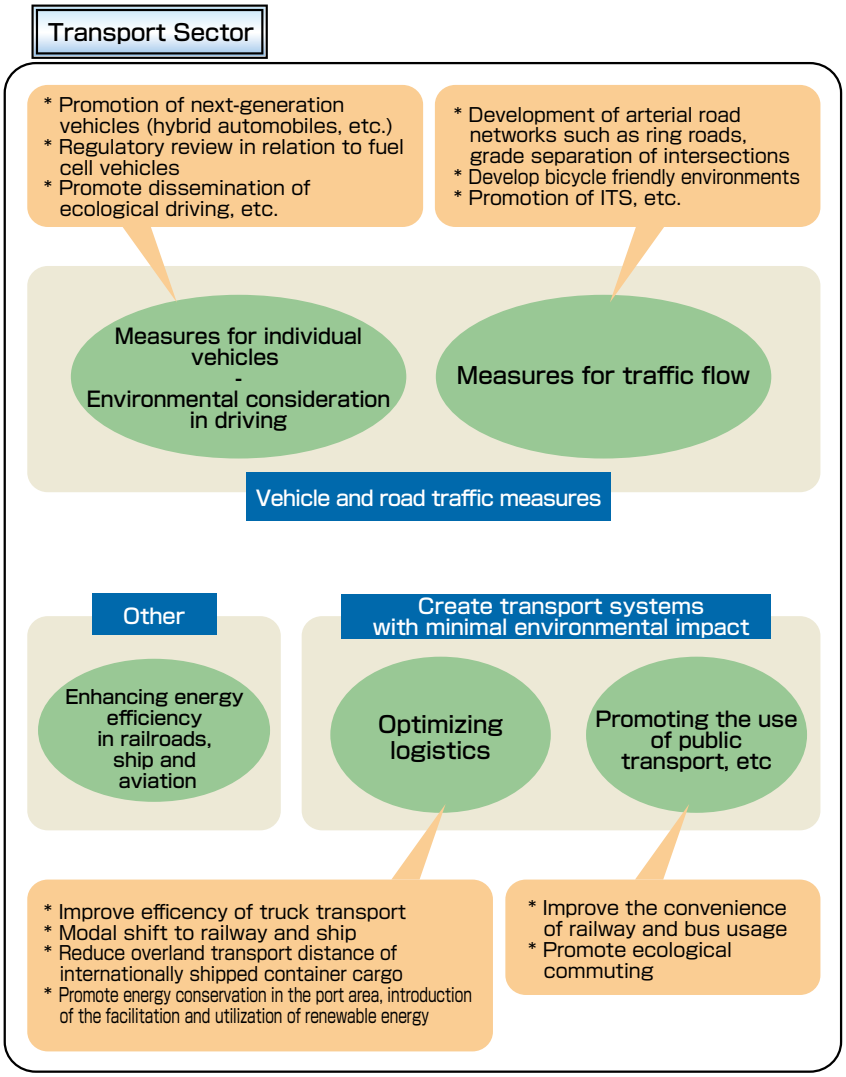
Ⅲ. Measures in Response to Major Environmental Problems of the Transport Sector

1 Promotion of global warming countermeasures

(1) Transport sector countermeasures

The amount of carbon dioxide emitted by the transport sector in 2017 was 4.9% greater than the amount emitted in 2013, but 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 Translated 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 automobile fuel efficiency is extremely important to reduce automobile CO_2 emissions and promote global warming countermeasures. In order to promote the improvement of automobile fuel efficiency, fuel efficiency standards (Top Runner Standards*) have been established based on the Act on the Rational Use of Energy (Energy Saving Act).

As a result, automobile manufacturing industry members (automobile manufacturers and importers) are required to improve fuel efficiency performance such that the average fuel efficiency of vehicles sold (determined by taking the weighted harmonic average of automobile fuel efficiency values) does not fall below standards set for each company based on their vehicle sales composition. Furthermore, it requires that they post fuel efficiency related information so that automobile users can select automobiles with superior fuel efficiency, and the fuel 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 2010 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 2015.

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 2004) for passenger cars by 2015.

In March 2013 new fuel efficiency standards were created for passenger cars, aimed at 2020, requiring fuel efficiency to be improved by 24.1% versus actual 2009 figures, assuming a shipped vehicle composition equivalent to that of 2009. Furthermore, in July 2015 fuel efficiency standards for 2022 were formulated for small trucks, based on the assumption of equivalent shipment volume as in 2012, requiring them to be 26.1% more fuel efficient than vehicles sold in 2012 (based on actual 2012 vehicle fuel efficiency).

In March 2019, fuel efficiency standards for 2025 were formulated for heavy duty vehicles (trucks, buses, etc.), based on the assumption of equivalent shipment volume ratio as in 2014, requiring them to be 13.5% more fuel efficient than 2015 standards.

○New fuel efficiency test method

In conjunction with the new 2015 fuel efficiency standards, the method for testing fuel efficiency was revised to more closely approximate actual driving conditions. In the past, 10-15 mode driving was used to test fuel efficiency, but this was changed to JC08 mode driving.

Under JC08 mode, driving is performed using a greater number of speed changes to reflect actual driving conditions. It also includes measurement methods under which vehicles are started with cold engines, in addition to starting with warmed up engines.

The World Light Vehicle Test Procedure (WLPT) was established at the UNECE World Forum for Harmonization of Vehicle Regulations (WP29), held in March 2014. In October 2016 Japan added WLTP to JC08 Mode as a method of testing exhaust gas emissions and fuel efficiency for passenger vehicles.

●Passenger vehicles

[Gasoline passenger vehicles, diesel passenger vehicles, and LP gas passenger vehicles (with occupancies less than 10 people or total vehicle weight of 3.5ton or less) and minibus (passenger vehicles with occupancies of 11 or more and total vehicle weight of 3.5t or less)] Target year: 2020 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 ～2270	2271～
Fuel efficiency standard (km/L)	24.6	24.5	23.7	23.4	21.8	20.3	19.0	17.6	16.5	15.4	14.4	13.5	12.7	11.9	10.6

[Fixed-route buses (automobiles with capacities of 10 or more and with a total vehicle weight in excess of 3.5 tons)] Target year: 2025 Measurement method: JH25 mode

Category (Total vehicle weight (kg))	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 (automobiles with capacities of 10 or more and with a total vehicle weight in excess of 3.5 tons)] Target year: 2025 Measurement method: JH25 mode

Category (Total vehicle weight (kg))	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

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

●Trucks/Freight vehicles

[Gasoline freight vehicles and diesel freight vehicles (total vehicle weight of 3.5t or less)] Target year: 2022 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: 2015 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: 2025 Measurement method: JH25 mode

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

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

■Measures for developing and promoting the 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 order to promote environmental conservation, starting with the reduction of CO_2 emissions, Japan's government designates electric vehicles, fuel cell vehicles, plug-in hybrid vehicles, hybrid vehicles, clean diesel vehicles and natural gas vehicles as "the next-generation vehicles" and is planning for their promotion.

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 electric 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.

Examples of automobile taxes (Motor vehicle tonnage tax, light vehicle tax) *As of October 2019

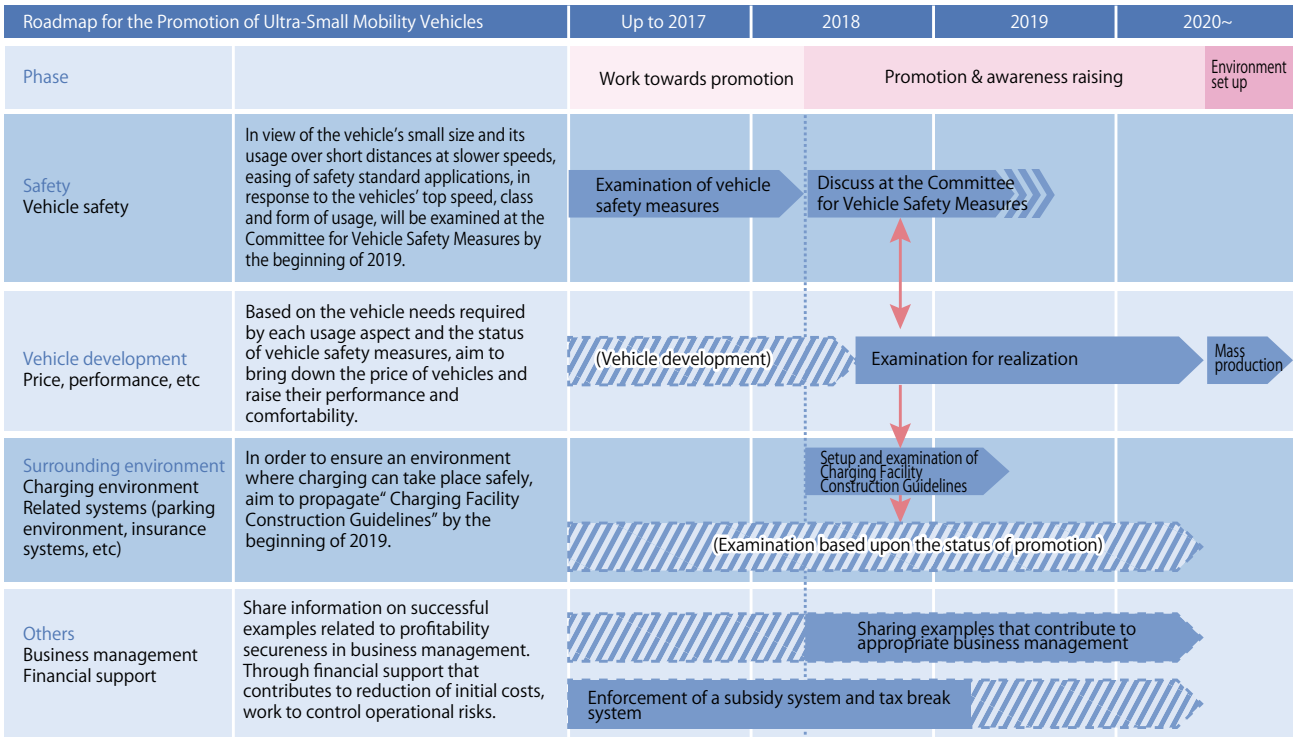
	Passenger cars	Heavy duty vehicles
Eco-car tax reductions (motor vehicle tonnage tax)	2019 / 2020: Achieved / +10% / +20% / +30% / +40% / +90% / EVs, etc. *1 Motor vehicle tonnage tax: ▲25% / ▲50% / Tax exempt / Tax exempt *2	2019 / 2020: 2015 fuel efficiency standard: No Achieved / Achieved / +5% / +10% / +15% / EVs, etc. *1 Motor vehicle tonnage tax: Outside scope / ▲50% / ▲75% / Tax exempt / Tax exempt *2
Green tax provision (vehicle tax/ light vehicle tax)	2019 / 2020: Achieved / +10% / +20% / +30% / EVs, etc. *1 Cars *3: Outside scope / ▲50% / ▲75% Light vehicles *3: Outside scope / ▲25% / ▲50% / ▲75%	2019 / 2020: EVs, etc. *1 Heavy duty vehicles: ▲75%

*1 "EVs, etc." refers to electric vehicles, fuel cell vehicles, plug-in hybrid vehicles, natural gas vehicles, and clean diesel passenger vehicles. In the case of light vehicle tax green tax provisions for light vehicle tax, it refers to electric vehicles, fuel cell vehicles, and natural gas vehicles. In the case of heavy duty vehicles, it refers to electric vehicles, fuel cell vehicles, plug-in hybrid vehicles, and natural gas vehicles.
*2 Tax exemptions apply to initial and subsequent inspections as well.
*3 For passenger vehicles and light vehicles, from 2021 onwards this will apply only to EVs, etc.

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

In addition, for the next-generation vehicles, such as electric 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, in regard to ultra-small electric 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, the revising of the certification system was carried out in January 2018. Also, in May of the same year a collection was publicly announced that includes a roadmap aiming for full-scale promotion and mass production at the "Seminar for Ultra-Small Mobility Vehicles Coexisting with the Local Area".



(May 2018) Committee summary

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

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

Source: The Eco-Drive Promotion Liaison Commitee

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 Translated 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.

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.

●Example of a bus-type vehicle

Column

Eco-tires

In the past "high fuel efficient tires" publicized by tire manufacturers were tested by themselves using their own internal testing standards. This created a demand for a unified evaluation method and selectable indices which would be used to compare products. In December 2009 the "JIS tire rolling resistance testing method" was established.

Based on this standard, The Japan Automobile Tyre Manufacturers Association formulated "High fuel efficient tire promotion related labeling guidelines (labeling system)" in order to promote the use of these. This guideline went into effect in January 2010.

The labeling system applies to passenger vehicle summer tires sold as replacement tires by tire retailers, etc. Tires within the following range are considered high fuel efficient tires.

Tire grading system

Unit (N/kN)

Rolling resistance coefficient	Grade
RRC≦6.5	AAA
6.6≦RRC≦7.7	AA
7.8≦RRC≦9.0	A
9.1≦RRC≦10.5	B
10.6≦RRC≦12.0	C

Unit (%)

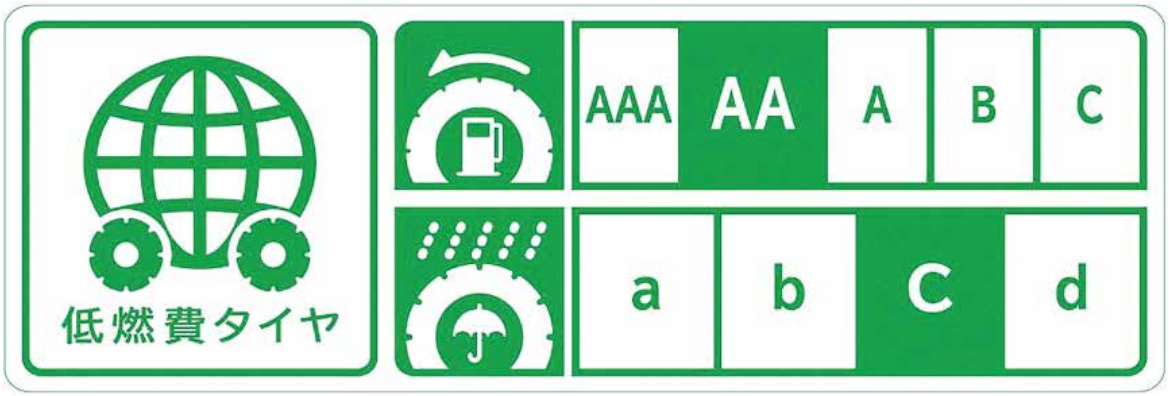
Wet grip performance (G)	Grade
155≦G	a
140≦G≦154	b
125≦G≦139	c
110≦G≦124	d

High fuel efficient tire performance requirements

Rolling resistance coefficient : 9.0 or less (Grade AAA to A)
Wet grip performance: 110 or greater (Grade a to d)

●Example of Eco-tires Laveling

In the example below, the rolling resistance grade is AA and the wet grip performance grade is c, so the tire meets high fuel efficient tire standards.



(Eco-tires)

Source: The Japan Automobile Tire Manufacturers Association
(Tentative Translated by Eco-Mo Foundation)

③Promotion of traffic flow measures

Smoother traffic flow increases driving speeds, which in turn produces greater effective fuel efficiency and reduces carbon dioxide emissions from vehicles. MLIT is implementing various traffic flow measures.

Specifically, these include the enhancement of arterial road networks, such as ring roads, which are effective at reducing the amount of traffic influx into central urban areas by providing alternate traffic routes, the creation of multilevel intersections, the promotion of projects for continuous grade separation, etc., in order to eliminate unopened railroad crossings, and other initiatives for reducing traffic congestion in urban areas. They also include the use of big data collected using ITS technology, the optimization of existing networks, Also, in order to continue environmental development for encouraging bicycle usage and reducing the carbon footprint of road facilities, LED road lighting is being installed.

■Strengthening the efficiency of distribution networks

In order to realize fast and smooth freight distribution, strengthen competitiveness on the world stage, and ease traffic congestion, the ring highways around Tokyo, Osaka and Nagoya will be intensively developed and the transport modal links between airports and harbors (distribution modal connect) will be strengthened. Also, manpower-saving and streamlining of truck transport will be promoted through the introduction of double-connected trucks and the speed up of passing permission for special vehicles.

■Promoting efforts to smarter use roads with ETC2.0 service

Efforts to use roads more wisely will be promoted, such as pinpointing areas that are congestion bottlenecks based on scientific analysis of big data that makes use of ETC2.0.

■Development and support of bicycle environments

Promote the development of bicycle by providing bicycle-lanes and encourage a modal transfer from automobiles to bicycles.

■Measures for railroad crossings that don't open most of the time

Push forward the elimination of railroad crossings that don't open most of the time and congest traffic.

■Reduction of road works

Enforce the reduction of road works through collaborative construction work, concentrated work, and the development of common ducts.

■Implementing LED road lights

Push forward the implementation of energy-saving LED road lights when the lights are newly constructed or updated.

■Extending the lifetime of pedestrian overpasses

In order to extend the life of road stock, promote changing from post maintenance management, where large-scale repairs are carried out after damages have become serious, to preventative maintenance management, where repairs are carried out while the damage is still only slight.

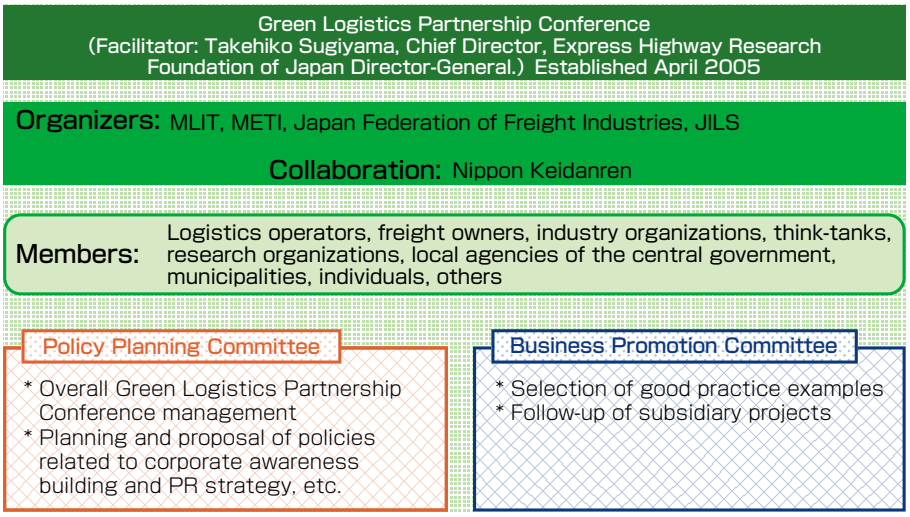
④Improvement of freight distribution efficiency

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

○Green Logistics Partnership Conference

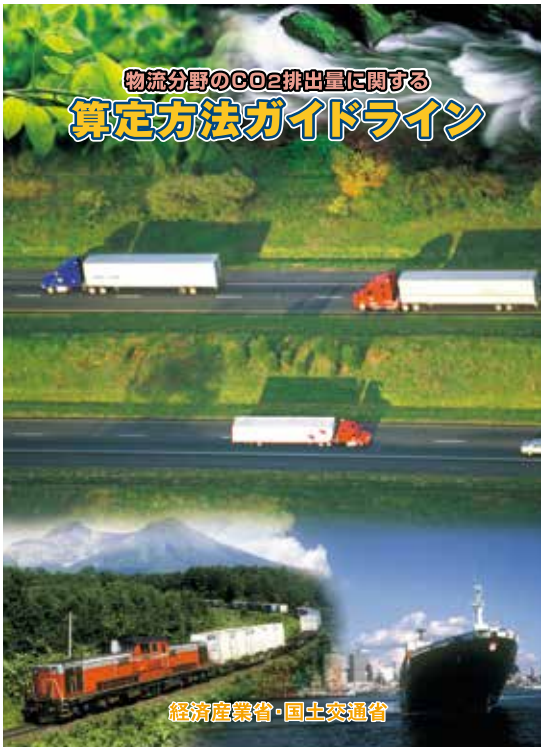
Promoting the creation of a greener overall logistics system requires greater collaboration between freight owners and logistics operators, and the expansion of sustainable logistics systems for global warming countermeasures improving productivity, etc.

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.



Source: Green Logistics Partnership Conference (Tentative Translated by Eco-Mo Foundation)

As part of these activities, the "Joint Guidelines on the Method for Calculating CO_2 Emissions by the Logistics Sector (Ver. 3.1)" (METI, 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. They make it possible to objectively evaluate the effectiveness of individual measures. Each year the organization gathers proposals from its members regarding specific Green Logistics Partnership implementation projects in order to promote measures for reducing CO_2 emissions. 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.



(Pamflet of The Joint Guidlines on the Method for Calculating CO_2 Emissions)

Source: Green Logistics Partnership Conference

■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.

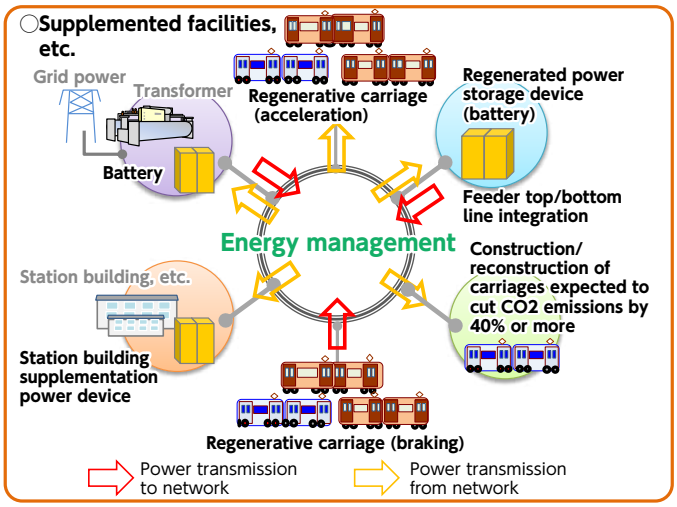
As part of these efforts it is implementing the "Eco-Ship Modal Shift Project", which promotes modal shift by selecting companies which contribute to modal shift by using some degree of sea transport, and permitting those companies to use the Eco-Ship Mark. As part of this project, the Eco-Ship Modal 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 February 2020, 158 freight owners and 180 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 encourage transport system carbon footprint reduction and promote usage through facility improvement

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 CO2 emissions by railroads and develop circular and ecological economies, the MLIT and the MOE are working together on a facility improvement project aimed at reducing the carbon footprints of transport systems and promoting their use. Through this, they are supporting the deployment of state-of-the-art energy-saving facilities and devices that use energy efficiently.

●Project to encourage transport system carbon footprint reduction and promote usage through facility improvement



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

○ "Eco Rail Mark" system promotion and expansion

The "Eco Rail Mark" was established in 2005 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. The MLIT and Railway Freight Association (RFA) are striving to further promote and expand the "Eco Rail Mark". As of July 26, 2019 there are 185 "Eco Rail Mark" product certifications for 209 products, 92 certified companies, and 36 certified supporting companies.

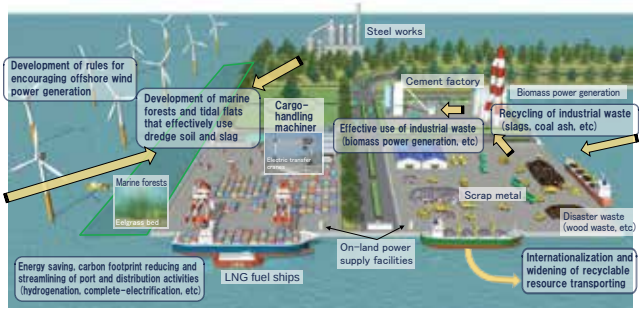
Source: RFA

○Promotion of comprehensive reductions in carbon emissions by ports

Port areas have large concentrations of cargo and passenger vessels, function as sites of industrial activity where land and sea freight distribution systems meet, and produce large amounts of greenhouse gasses. MLIT is striving to effectively reduce these emissions.

Specifically, "CO_2 Emission Source Countermeasures" are being carried out that include introducing offshore wind power generation, reducing the carbon footprint of shipping vessels, cargo-handling machinery, trailers and other transport machinery, and introducing on-land power supply facilities. In addition, "CO_2 Absorption Source Countermeasures" are also being encouraged through use of blue carbon ecosystems (marine forests,

●Comprehensive reductions in carbon emissions in ports



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

etc) that effectively use industrial by-product such as steel slag. By promoting these efforts, the realization of a world-first "carbon-free port" is being aimed for.

○With regards to the partial revision of 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, 2019, 194 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 April 16, 2019, approval was given for the first time in Japan for an initiative, carried out by Sagawa Express and JR Hokkaido, for consolidated transport of passengers and freight combining multiple passenger transport modes (rail and taxis).

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.

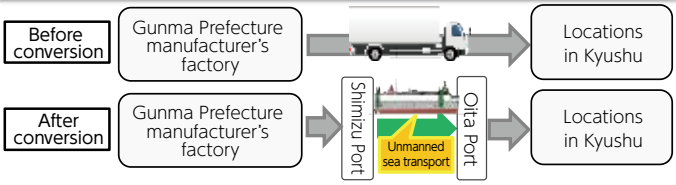
② Support for necessary facilities and equipments, etc.
- Special taxation structures for transport-linked warehouses (warehouses with truck arrival time reservation systems, etc.)

→Corporate tax: 10% 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

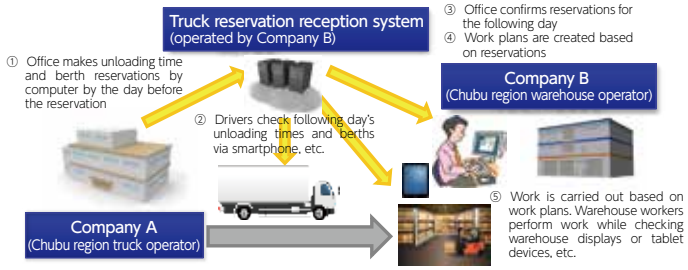
<Example 1> Sea transport used for portion of trunk transport



○ Driver drive time 67% reduction
- Drive time reductions contribute to reductions in drives involving overnight stays.

○ CO_2 reduction percentage: 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 percentage: 22.9%

Source: MLIT (Tentative Translated 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 a green management promotion manual 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.

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.

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 manual. 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.

(Poster of Green Management Certification System)

(Manual of the Green Management Certification System)

⑤Promotion of usage of public transport

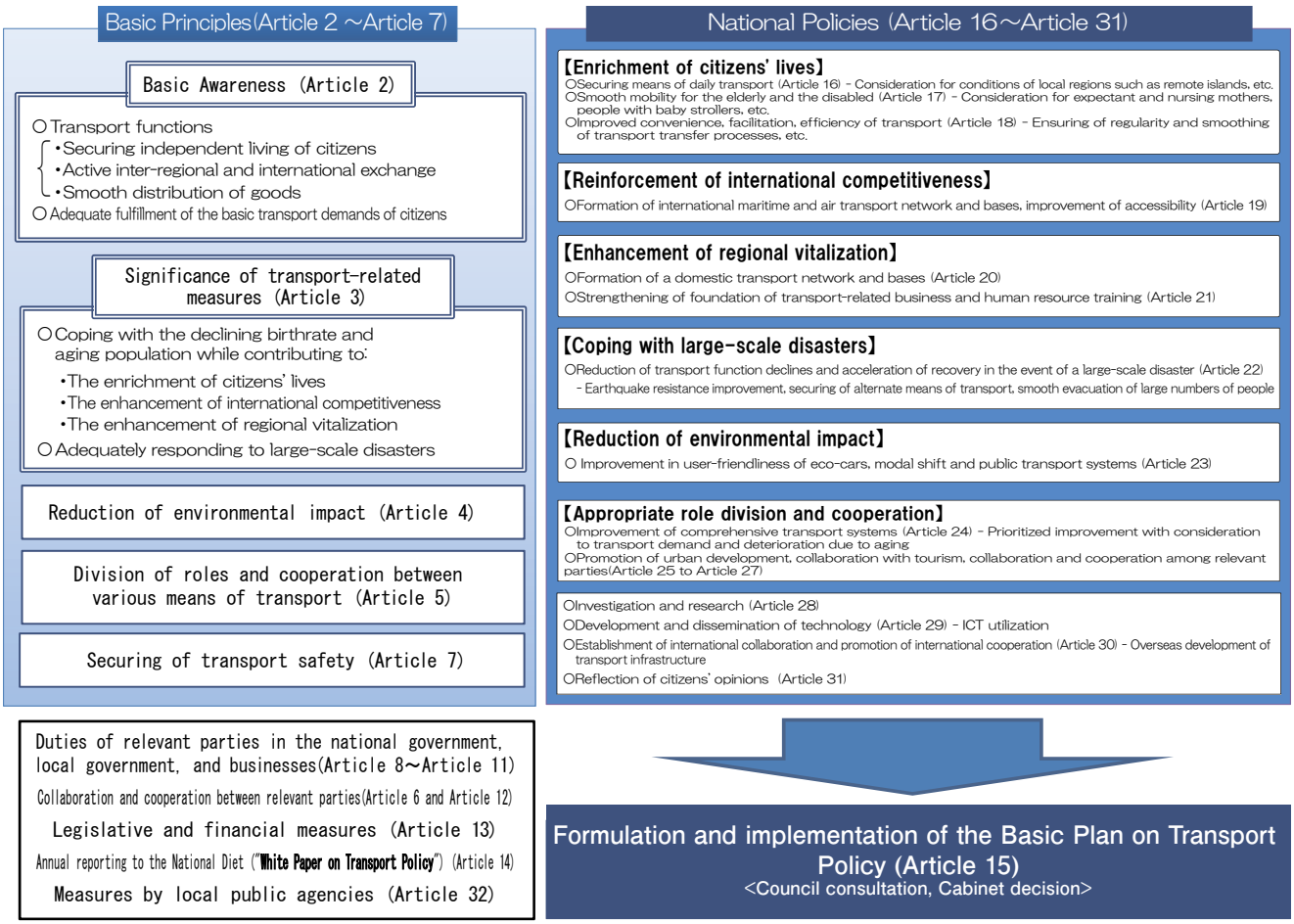
Creating new railroad lines and new transport systems, and making rail and bus transport more convenient, contribute a shift in passenger transport from private cars to public transport, which has less of an environmental impact. This leads to reductions in automobile CO_2 emissions, so various measures 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 Basic Transport Policy Plan which received Cabinet approval on February 13, 2015 stipulates 2014 to 2020 as the planning period and, based on this Plan, transport policies are being promoted both comprehensively and systematically.

In addition, the Basic Transport Policy requires Cabinet Decision on the Transport Policy White Paper. The 2019 version of Act on the Transport Policy White Paper was decided on by the Cabinet and reported to the Diet in June 2019.

●Summary of the Basic Transport Policy Plan



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

Social and economic changes addressed by this plan

(1) Highly unique regional regeneration amidst rapidly shrinking and aging population (2) Increasing globalization (3) Imminent large-scale disasters and deteriorating infrastructure (4) Global environmental problems (5) Developments in technological innovation such as dramatic advances in ICT (6) Recovery from the Great East Japan Earthquake (7) 2020 Tokyo Olympics and Paralympics

Basic approach	A. Creation of easy to use transportation which contributes to the rich lives of citizens	B. Creation of international and inter-regional passenger transport and distribution networks which can serve as infrastructure for growth and prosperity	C. Creation of sustainable, safe, secure transport infrastructure
Measure objectives	①Rebuilding of regional transportation networks coordinated with community development, such as compact cities ②Additional support for diverse transport services ③Greater implementation of barrier-free efforts ④Further improvement of passenger transport and distribution service levels <Introduction and implementation of on-demand transport> 311 cities, towns, and villages → 700 cities, towns, and villages (2020) <Level difference elimination ratio for major passenger facilities> [Train stations] 83% →100% (2020)	①Enhancement of the competitiveness of international transport network ②Expansion of flow of people and goods between regions ③Cooperation with tourist facilities with aim of reaching 20 million international tourists ④Global deployment of transport infrastructure and services utilizing Japanese technologies and expertise <Total annual departure and arrival capabilities of Tokyo-area airports> 717,000 flights → 747,000 flights + up to 79,000 flights (2020)	①Preparation for large-scale disasters and response to infrastructure deterioration ②Strengthening of the infrastructures of transport related businesses and ensuring of stable and safe operation ③Securing and training of transport personnel ④Greater implementation of environmental measures such as further reductions in carbon emissions and energy usage <Earthquake-proofing of emergency transport roads and bridges> 79% → 82% (2016) <Railroad freight traffic volume (modal shifting-related)> 18.7 billion tons → 22.1 billion tons 2020)

Items of special note

* Implement appropriate visualization and perform appropriate follow-up
* The national government, local governments, businesses, users, residents, and other related parties bear their own individual roles and responsibilities, and must coordinate and collaborate with each other
* Use technological advances such as ICT, etc., to drive innovation
* Implement efforts with focus on 2020 Tokyo Olympics, Paralympics, and beyond

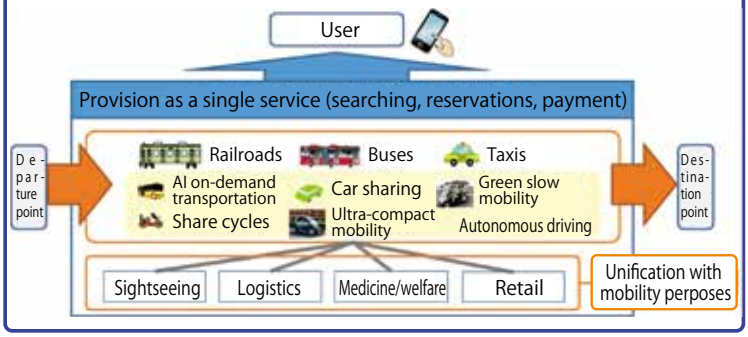
Source: MLIT (Tentative Translated by Eco-Mo Foundation)

■Promotion and support for Japanese MaaS

Support is being provided for the creation of the infrastructure needed for verification experiments for the new mobility service, Mobility as a Service (MaaS), as well as for the widespread use of MaaS, which will help solve regional 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.

Creation of a MaaS model

Support for verification experiments for new MaaS models that involve coordination with diverse services and contribute to the solving of local problems



Creation of infrastructure for the promotion of MaaS

Support for measures essential for widespread use of MaaS

Development of new transportation services and promotion of cashless payment

Launch of AI on-demand transportation (smart AI mobility)

Introduction of QR code payment, etc.

Data infrastructure creation

Preparation of system for creation of data from transport operators

Widespread use of MaaS at locations nationwide ⇒ Creation of Japanese MaaS

Resolution of local problems

(securing and enriching transportation in rural areas and tourist destinations, maintaining and invigorating public transport, etc.)

■Measures for promoting rail use

The MLIT provides support for efforts by rail operators to promote the use of urban rail, achieve greater speeds on existing arterial railroads, achieve greater speeds on freight rail lines, convert freight rail lines into passenger rail lines, smooth interconnections, make comprehensive improvements to railway stations, and implement barrier-free measures in railway stations, etc.

●Measures for enhancement of services and convenience

◆Rail station comprehensive improvement projects

Keikyu Corporation Kanazawa Hakkei Station, Hanshin Electric Railway/Keifuku Electric Railroad Saiin Station, Sagami Railway Ebina Station, Tokyu Corporation Ikegami Station, Odakyu Electric Railway Chuorinkan Station

◆City railroad convenience promotion projects

・Speed improvements

Sotetsu/Tokyu through line (Yokohama Hazawa area - Hiyoshi)

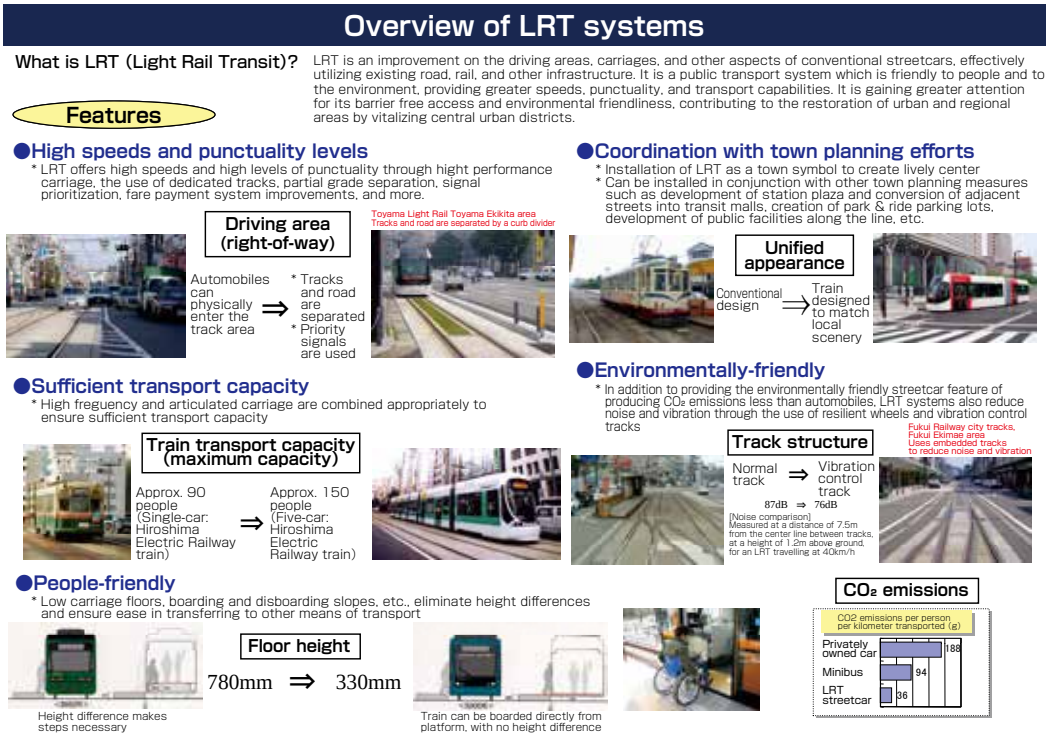
It is also collaborating with rail operators in the "Eco Rail Campaign", promoting the use of rail transport as an handy environmental action.

(Campaign for eco using railways)
Source: MLIT (Tentative Translated by Eco-Mo Foundation)

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 "Emergency measures for creating environments to accept foreign visitors".

* 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 Translated by Eco-Mo Foundation)

■Revised Act on Vitalization and Rehabilitation of Local Public Transport Systems

In May 2014 a revision to the Basic Act on Transport Policy was issued, and enacted in November of the same year.

Also, the August 26, 2015, the Revised Act on Revitalization and Rehabilitation of Local Public Transport Systems and Japan Railway Construction, Transport and Technology Agency Act (Act No. 28 of 2015) created a system for funding, etc., projects for improving certified rail transport, etc.

●Overview of the Revised Act on Vitalization and Rehabilitation of Local Public Transport Systems

Overview of the Revised Act on Vitalization and Rehabilitation of Local Public Transport Systems(issued in May 2014)

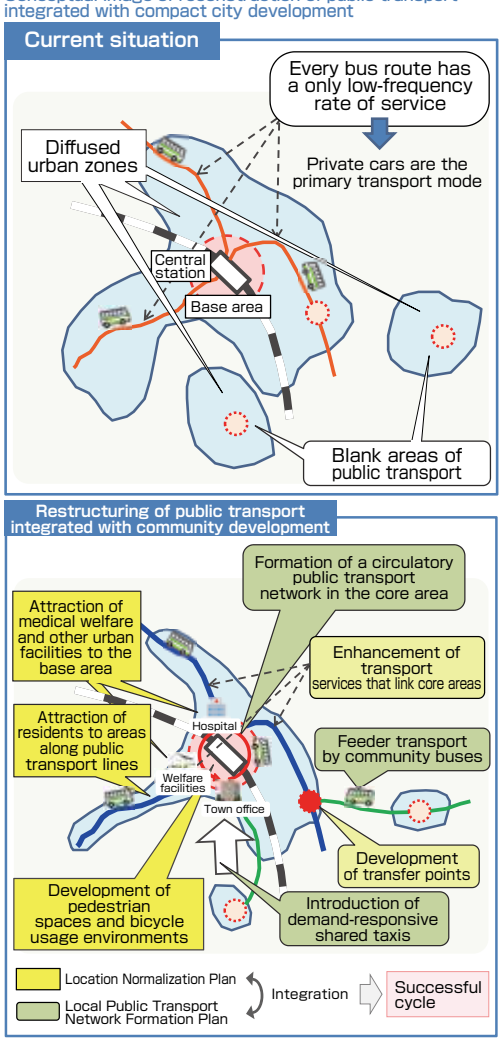
○Revised Act on Vitalization and Rehabilitation of Local Public Transport Systems (issued in May 2014, enacted in November 2014)

Maintain and improve regional societal vigor in the face of full-fledged population reductions

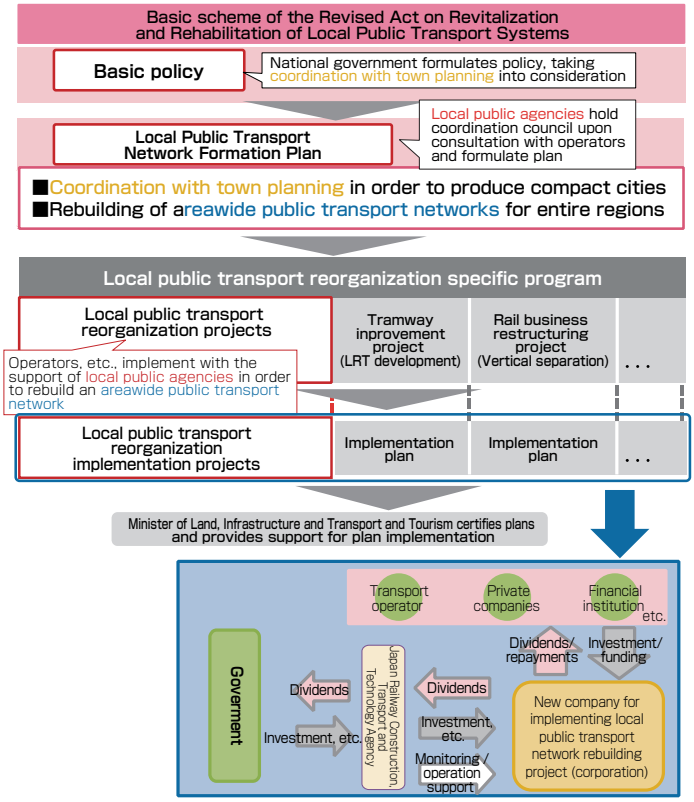
Key Points

①Rebuild with a focus on local goverments
②Integrate with community development
③rebuild an areawide public transport network

Conceptual image of reconstruction of public transport integrated with compact city development



Source: Prepared by the MLIT based on the approaches taken in Toyama City, Kumamoto City, Toyooka City, Sanjo City and elsewhere.




(LRT)


(BRT)


(IC Card)

○Reviced Act on Vitalization and Rehabilitation of Local Public Transport Systems and Japan Railway Construction, Transport and Technology Agency Act(Issued in May 2015, enacted in August 2015)

◆Create a system for investment/funding, etc., via the Japan Railway Construction, Transport and Technology Agency by industrial investment in projects aimed at rebuilding regional public transport networks which have received certification from the Minister of Land, Infrastructure, Transport and Tourism in accordance with the Act on Revitalization and Rehabilitation of Local Public Transport Systems, and strengthen and diversify support for this system.

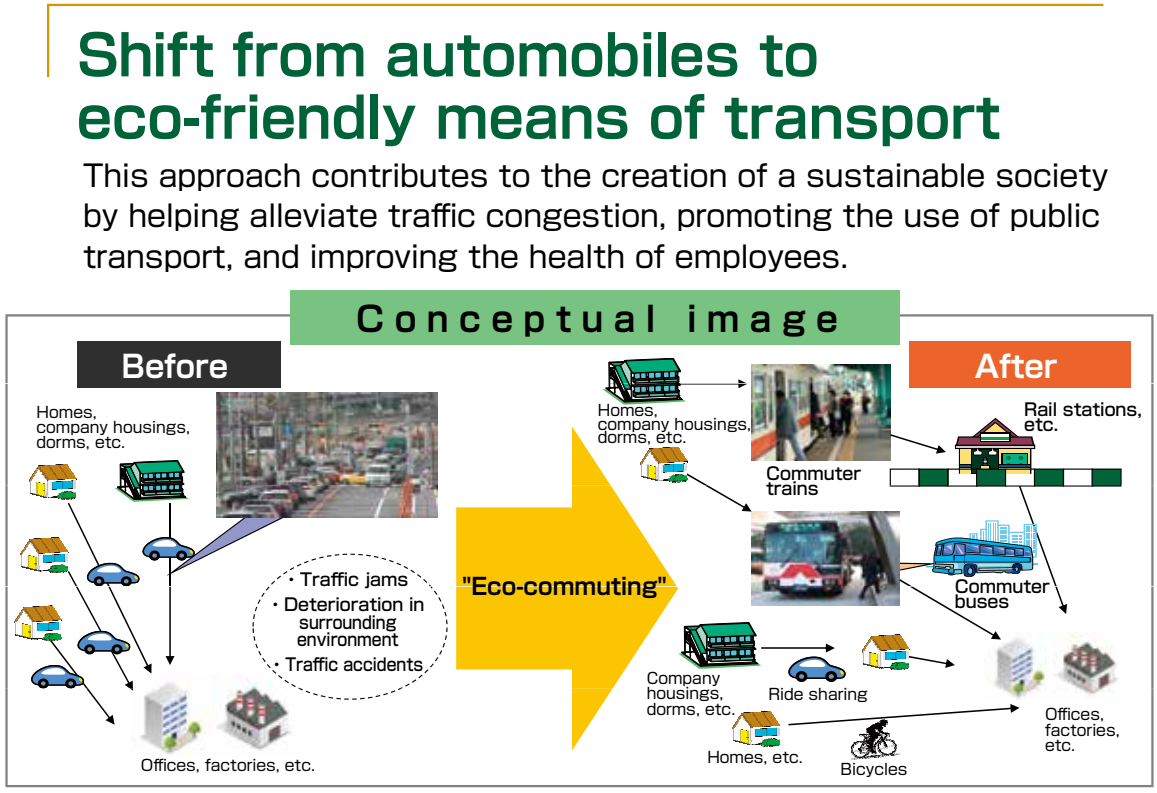
Source: MLIT (Tentative Translated by Eco-Mo Foundation)

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.

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 2019, 757 business sites have been registered.

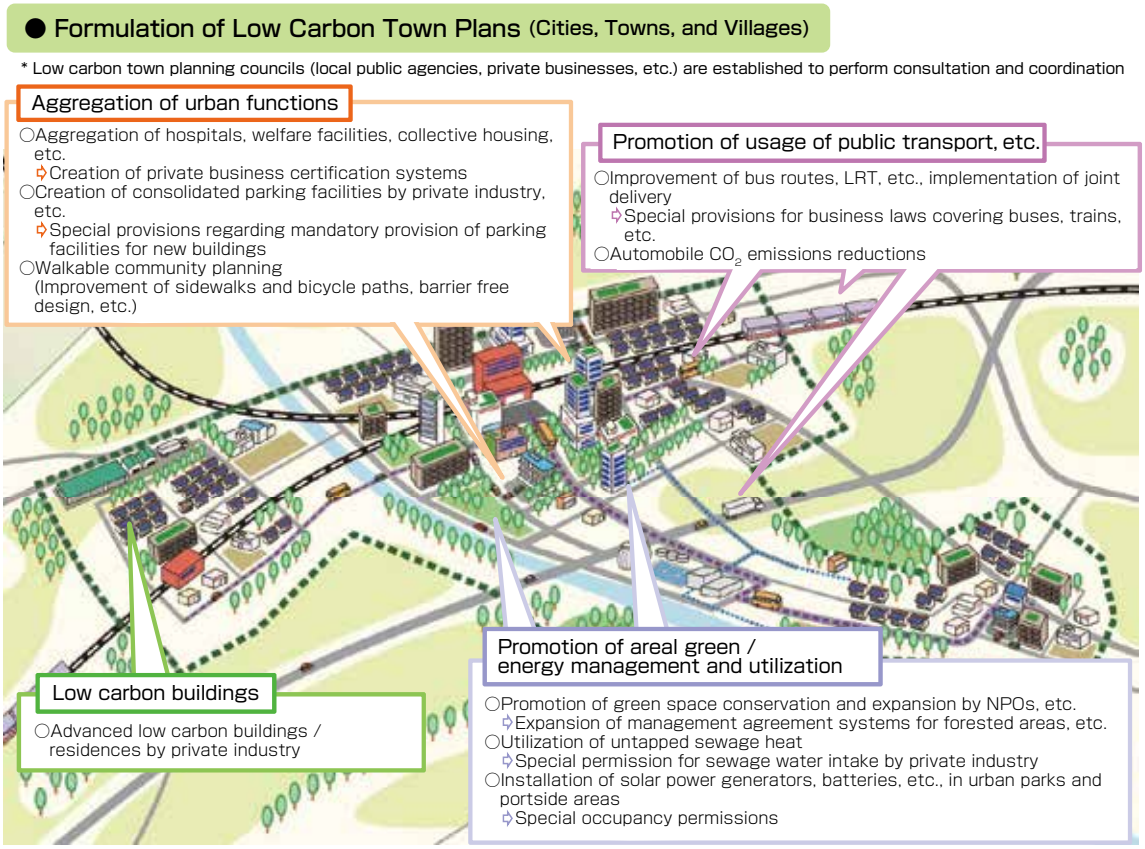


Source: MLIT (Tentative Translated by Eco-Mo Foundation)

■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, promotive greater adoption and vitalize the housing market and local economies, by promoting 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 2019, 24 cities have created low carbon town plans. These plans are listed on the MLIT website.



Source: MLIT (Tentative Translated 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.

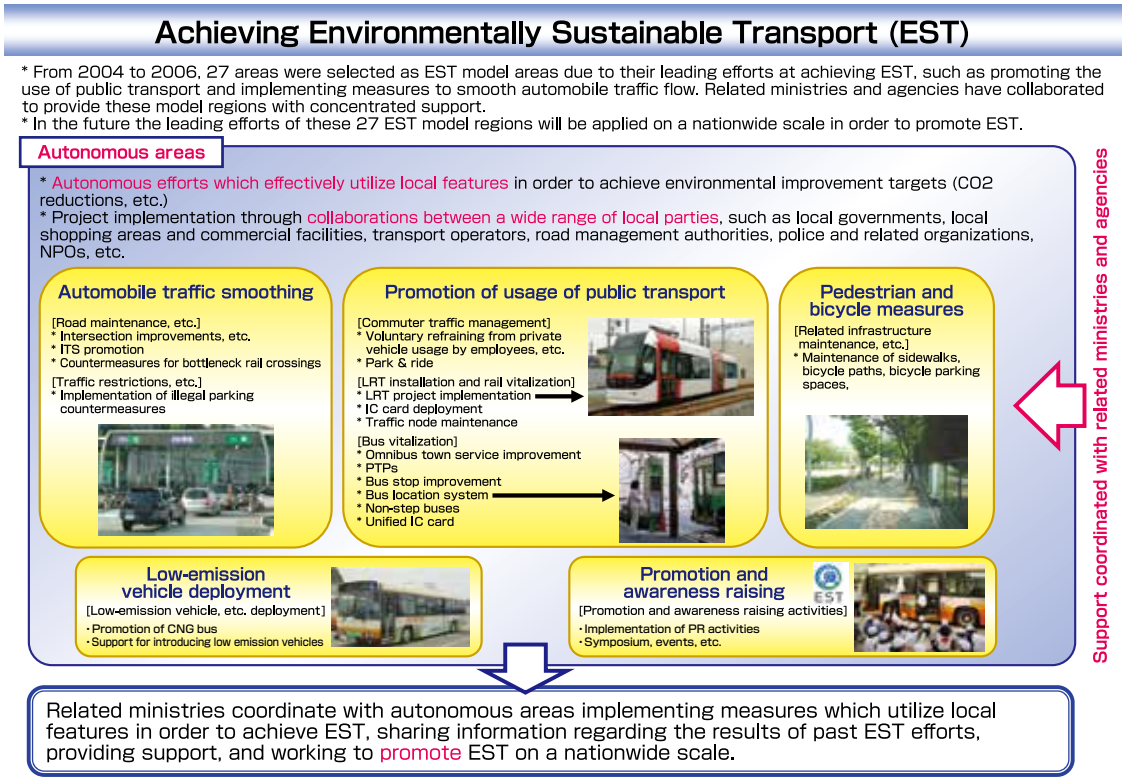
In order to achieve this, the MLIT has implemented an "EST Model Project", selecting areas which are implementing leading efforts at achieving "Environmentally Sustainable Transport (EST)", and related ministries and agencies collaborate to provide support in the areas such as promoting the use of public 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 2004 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 Translated 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.

The 11th Forum was held in 2018 in Ulaanbaatar, Mongolia. Although the Forum was initially focused on transport, the theme of this Forum was "Sustainable Urban Design and Development - The Role of EST." This theme was selected because Ulaanbaatar struggles with severe air pollution, so Mongolia wanted to discuss transport issues from the perspective of urban planning, and with the desire of achieving SDG 11. In 2019, the 125h Forum was held in Hanoi City, Vietnam. It also had an urban theme, focusing on the key concept of "smart cities." The idea that engaging in multifaceted deliberations from the perspective of urban design is effective approach to tackling issues related to Environmentally Sustainable Transport is becoming more firmly ingrained.

In 2020, the Forum will be held in Thailand.

Green Slow Mobility

Based on the Paris Agreement that was concluded in 2015, the reducing of greenhouse gas emissions to essentially zero by the latter-half of the 21st century is being aimed for within a global framework. In Japan, in order to realize a low carbon society, efforts are currently being pursued to realize the "Unified improvement of the environment, economy and society" by solving a number of economical and regional issues simultaneously through environmental policies.

At the MLIT, based on this concept of the unified improvement of the environment, economy and society, "Green Slow Mobility" is being promoted. Green Slow Mobility aims to solve various transport problems in local areas, such as the securing of transport where societal aging is advancing and the development of new sight-seeing mobility for tourist attractions. Simultaneously it also aims to spread low carbon mobility in local areas.

Green Slow Mobility refers to public electric vehicles that carry four passengers or more and drive on public roads at under 20 km per hour. The introduction of these vehicles is expected to solve a number of transport problems in local areas and ensure low-carbon transport.

Green slow mobility (GSM): Public electric vehicles that carry four passengers or more and drive on public roads at under 20 km per hour

【5 characteristics of GSM】
①**Green**･･･Electric vehicles with low CO_2 emissions.
②**Slow**･･･Slow speeds are perfect for tourism.
③**Safety**･･･Safe due to speed limitations. Vehicles can be driven by the elderly.
④**Small**･･･Small size makes even narrow roads navigable.
⑤**Open**･･･Open, windowless design makes for a fun ride.

* Operational for route bus businesses, taxi businesses, and paid passenger transport with private vehicles.

Light vehicles	Small vehicles	Standard-sized vehicle
 4-person	 7-person	 10-person
 4-person	Special purpose vehicles (8-license plates)	 Supports wheelchair lifts 10-person
	 Assistive vehicles	 Supports wheelchair lifts 16-person
		* A midsize vehicle driving license is required to operate vehicles bearing 16 people

【Usage scenarios】

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


Kasaoka City, Okayama Prefecture


Fukuyama City, Hiroshima Prefecture


Machida City, Tokyo


Toshima, Tokyo

Source: MLIT homepage (Tentative Translated by Eco-Mo Foundation)

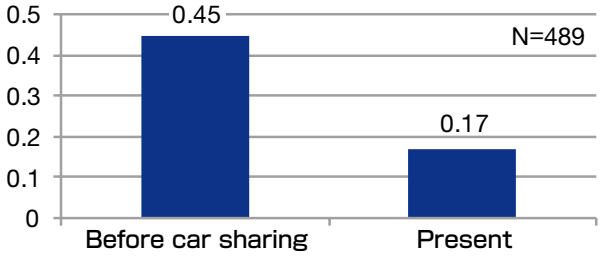
Column

Effectiveness of car sharing in reducing environmental impact

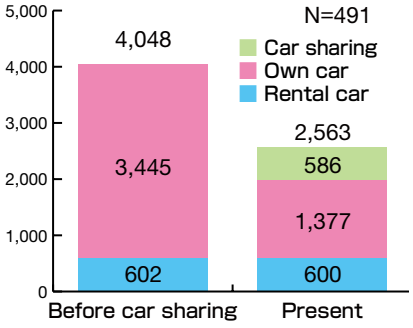
Car sharing, in which people can use cars when they need them, without owning the cars, is growing in popularity worldwide. Over 1.6million people in Japan utilize in car sharing (according to March 2019 servey by the Eco-Mo Foundation).

In 2012 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.

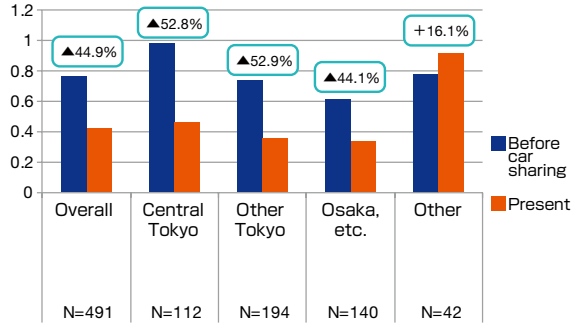
●Change in average number of automobiles owned per household



●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 ward, Minato ward, Chuo ward, Shibuya ward, Shinjuku ward, Bunkyo ward, Toshima ward

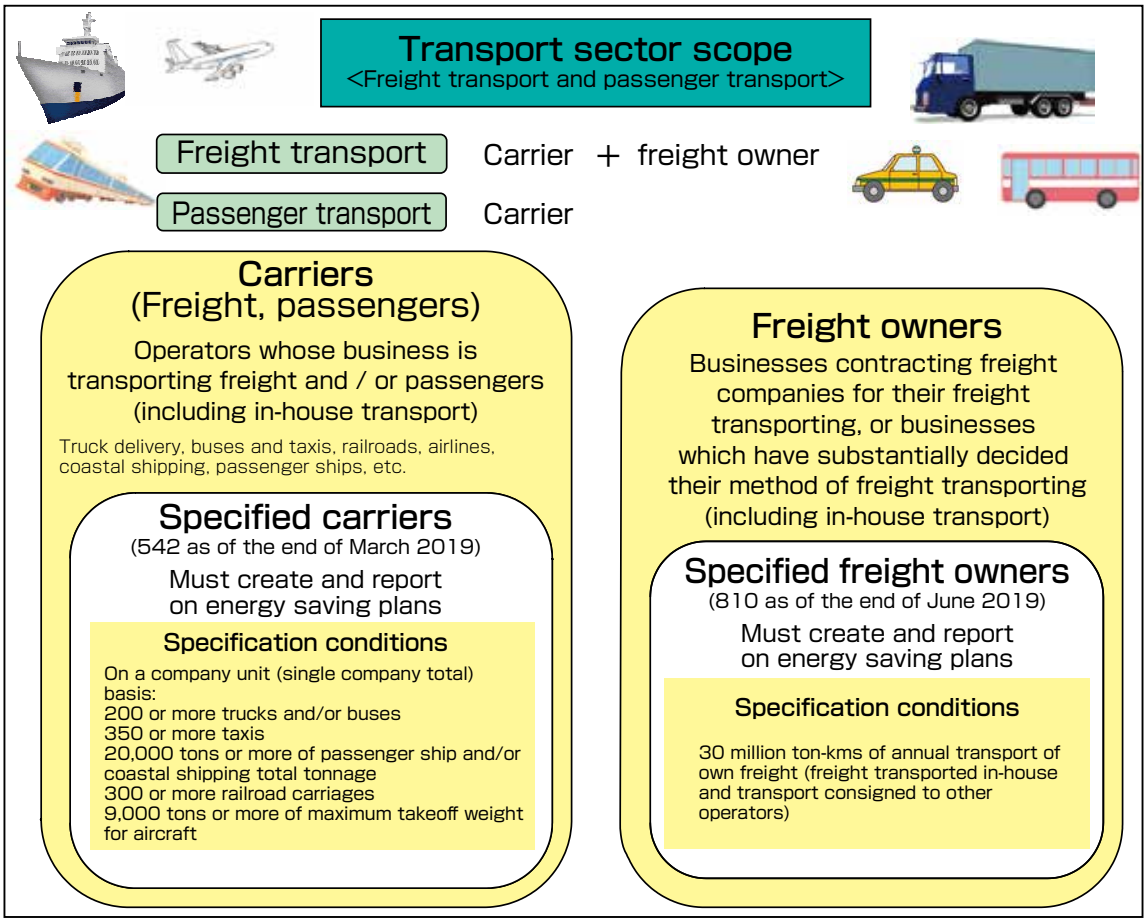
Note 2) Osaka, etc: Osaka Prefecture, Hyogo Prefecture, Kyoto Prefecture, Aichi Prefecture, Kanagawa Prefecture

(2) Energy Saving Act-based measures

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

The Act on the Rational Use of Energy (the Energy Saving Act) seeks to rationalize the use of energy based on "Operator's decision criteria" defined by the national government. Carriers (specified Carriers) using a specified amount of energy or more are required to report on their energy usage yearly, and formulate plans (medium to long term plan) (3-5 years) for rationalization of energy use. Carriers and freight owners became applicable as of the April 2006 revision of the Act.

Furthermore, in looking towards the realization of the long-term energy supply-demand prediction (energy mix) established in 2015, in 2018 the Energy Saving Act was revised in order to encourage even more streamlining of energy usage, and businesses managing energy as one group and energy saving efforts through collaborating businesses have become able to be assessed appropriately through regular reports due to receiving authorization from the Minister of Land, Infrastructure and Transport.



Specified carrier designation status (total of 542 companies as of the end of March 2019)

	Freight				Passengers				Aviation	Total
	Railway	Commercial trucks	Private trucks	Shipping	Railway	Buses	Taxis	Shipping		
No. of carriers	1	277	79	32	26	93	21	11	2	542

[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 electrical 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.

	Measures to be taken
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 use of 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 electrical 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.

(3) International maritime and air transport sector countermeasures

■Introduction of international maritime transport CO_2 regulations

The International Maritime Organization (IMO) is responsible for establishing uniform worldwide measures for reducing carbon dioxide (CO2) 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. Japan has led the development of such an international framework at the IMO for reducing CO2 emissions.

Under Japan's leadership, the energy efficiency regulations for new ships entered into force in 2013, which have been gradually strengthened in a phased approach, and, in May 2019, the IMO agreed to further strengthen and move up the implementation of the latest phase of these regulations. From January 2019, a new framework has been introduced with the aim of promoting energy-saving sailing. Under this framework, annual fuel consumption volume, sailing distance, and sailing time must be reported to the IMO every year, which then visualizes the fuel consumption records of individual vessels. The data collected through this framework will be utilized to design future policies at the IMO. Furthermore, in April 2018, based on proposals from Japan, the Initial IMO Strategy on Reduction of Greenhouse gas (GHG) Emissions from Ships was adopted as a world-first commitment to aim for zero GHG emissions globally in a single sector as soon as possible within the century. From May 2019, in order to achieve the targets in the Strategy, international negotiations have begun on the formulation of a new international framework at the IMO. In order to achieve the global GHG reduction targets , Japan is proposing a new regulatory measure on existing ships with inferior energy efficiency performance. Japan, as a country with one of the world's most prominent maritime industries, is expected to contribute to the realization of a practical international framework that can effectively address global actions to address the climate change.

■International air transport sector greenhouse gas emissions reduction measures

With regards to greenhouse gas emissions reductions in the international air transport sector, the International Civil Aviation Organization (ICAO) has engaged in deliberations aimed at defining global reduction targets ([1] annual fuel efficiency improvement of 2%, [2] prevention of total emissions from increasing from 2020 onwards), introducing new technologies, improving transport methods, utilizing alternative fuels, and creating a Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA).

The system was adopted as an annex to the Convention on International Civil Aviation in June 2018, and from 2021 autonomously participating countries will begin implementing reductions in greenhouse gas emissions based on the system. From 2027 onwards, participation will be mandatory for all countries except those with emissions levels below a defined threshold.

●International air transport global warming countermeasures

Global reduction targets

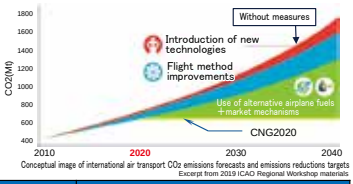
ICAO Assemblies (2010 and 2013) have decided on global CO2 emissions reduction targets for international air transport

Global reduction targets	Basket of Measures
1. Annual fuel efficiency improvement of 2% 2. No increase in total emissions from 2020 onwards (CNG2020: Carbon Neutral Growth 2020)	① Introduction of new technologies (new models, etc.) ② Improvement of flight methods ③ Use of alternative airplane fuels ④ Use of market mechanisms

Introduction of CORSIA

Shortfalls resulting despite the introduction of new technologies, improvements of flight methods, and the use of alternative airplane fuels will be addressed with a system that uses market mechanisms

* The 39th ICAO Assembly, held in 2016, adopted a new system and specific measure contents (Carbon Offsetting and Reduction Scheme for International Aviation : CORSIA)
* In 2018, an annex regarding CORSIA was adopted



Conceptual image of international air transport CO2 emissions forecasts and emissions reductions targets
Excerpt from 2019 ICAO Regional Workshop materials

	2019 to 2020	2021 to 2026	2027 to 2035
Assessment of emissions volume	Applies to all countries (baseline setting)	Applies to all countries	Applies to all countries
Carbon offsets (Assigned to each operator based on emissions in excess of baseline emissions. Operators use carbon credits or alternative airplane fuels to cancel out these amounts)	-	Flight routes between voluntary participated countries	Shipping routes between voluntary participated countries and mandated participated countries (excluding countries with low emissions amounts, least developed countries, etc.)

* Preliminary calculations based on specific assumptions indicate that the total credit purchase amounts for Japanese airlines is expected to rise in stages from slightly over a billion yen per year in the first year of the system, 2021, to several tens of billions of yen per year by 2035
* Emissions assessment has already been introduced based on the business permit requirements of international air transport operators (Article 210, Paragraph 2 of the Civil Aeronautics Act Enforcement Regulations). In the future, offset are expected to be revised likewise.

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

Column

Emissions trading system measures

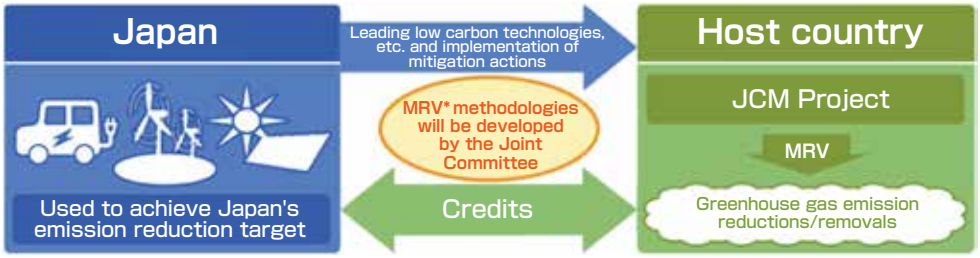
The Japanese government has proposed a Joint Credit Mechanism (JCM) for international emissions trading. With the end of the adjustment period for the first commitment period of the Kyoto Protocol (by 2015), countries not participating in the second commitment period cannot internationally transfer or acquire Kyoto Mechanism credits.

Japan is operating and promoting the J-Credit Scheme for domestic emissions trading.

■Joint Credit Mechanism (JCM)

Japan has proposed the Joint Credit Mechanism (JCM) as a system for flexibly and rapidly transferring technologies and implementing countermeasures in accordance with conditions in developing countries in order to contribute to global emissions reductions and absorption. This mechanism quantitatively evaluates Japan's contributions to greenhouse gas emission reductions and absorption through usage and implementation of greenhouse gas reduction technologies, products, systems, services, infrastructure, and the like. This is used to help Japan achieve its emission reduction targets.

With the collaboration of host countries, the design of the mechanism will be further accelerated in the future, the mechanism will be put into effect soon, specific, concrete projects will be implemented, and the mechanism will provide transparency in order to contribute to UN discussions.



*MRV (Mesurment Reporting Veritification)

Source: New Mechanisms Information Platform (Tentative Translated by Eco-Mo Foundation)

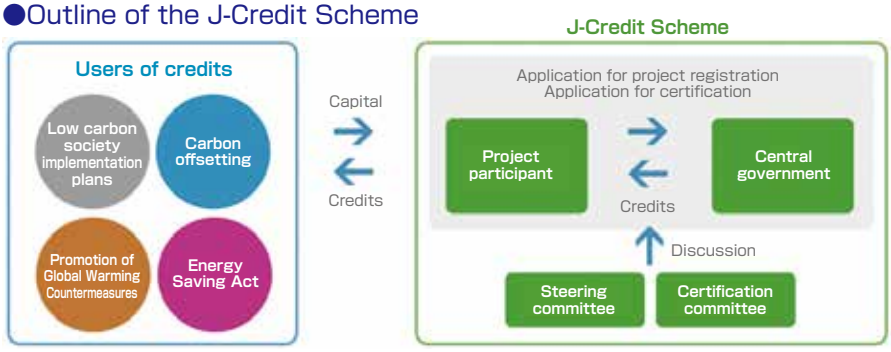
■J-Credit Scheme

The J-Credit Scheme is system in which reductions and absorption of greenhouse gasses such as CO_2 through measures such as the deployment of energy-saving devices and forest management are certified by the national government as "credits".

This system is an extension and merging of the domestic credit system and offset credit system (J-VER), and is operated by the national government.

The credits produced by this system can be used for various purposes, such as achieving "Commitment to a Low Carbon Society" and for use as carbon offsets.

●Outline of the J-Credit Scheme



Source: J-Credit Scheme website (Tentative Translated by Eco-Mo Foundation)

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

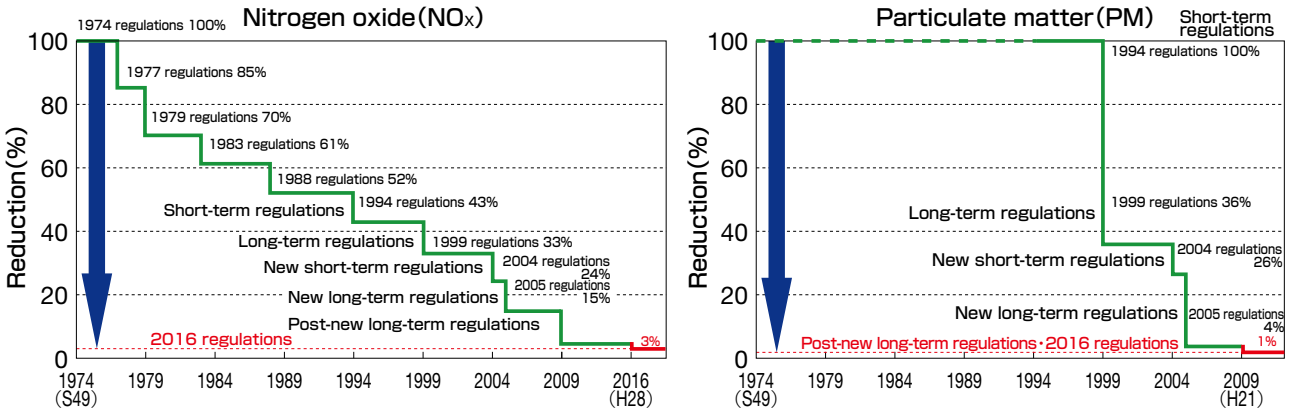
The problem of vehicle exhaust gas became a serious social problem with the rapid urbanization which began in the mid-1960s and the increase in vehicle traffic. For emissions gas measures for diesel vehicles it is especially important to reduce the amount of emissions of nitrogen oxide (NOx), which is a cause of respiratory disorders and causes photochemical smog and acid rain, and particulate matter (PM), 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 Translated 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, extending the application of the regulations to users in order to achieve air quality standards targets in urban areas by 2020.

	Automobile NOx/PM Law	Tokyo, Saitama, Chiba, and Kanagawa Prefectures	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

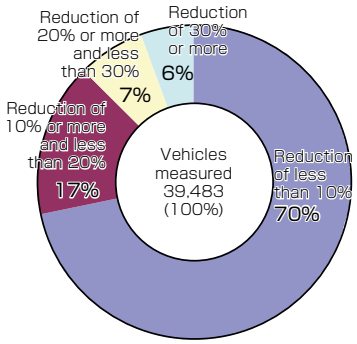
①Appropriately maintained vehicle usage

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 2005 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

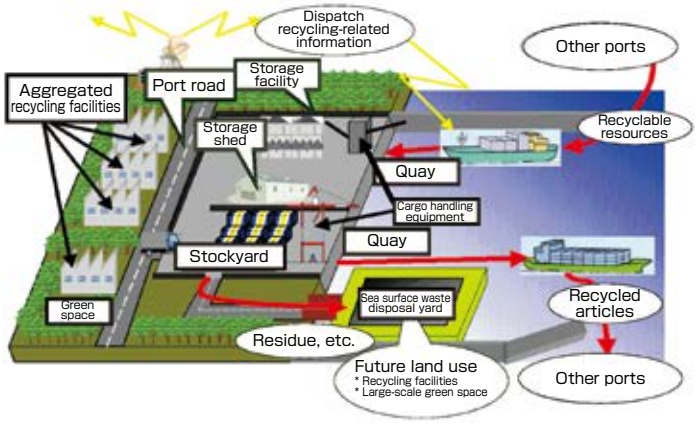
In order to create a recyclable resource cycle as part of the creation of a recycling-oriented society, 22 ports nationwide have been designated as Recycle Ports (integrated venous logistics ports), centers of wide-area circulation of recyclable resources. The MLIT provides the support necessary to improve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

●Recycle Port locations and Recycle Port image

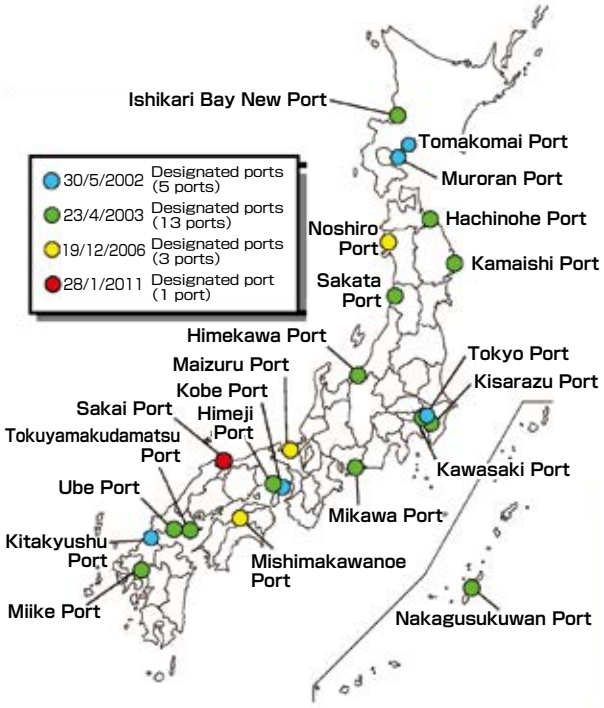
Recycle Port Policy

- 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)
- Support (subsidies) for the creation of low carbon reverse logistics systems based on sea transport
- 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)



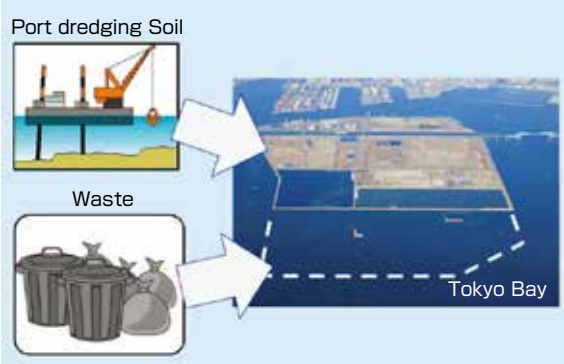
[Expected benefits] Support for the creation of a recycling-oriented society, reduction of environmental impact, reduction of recycling costs, and vitalization of coastal area industry

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

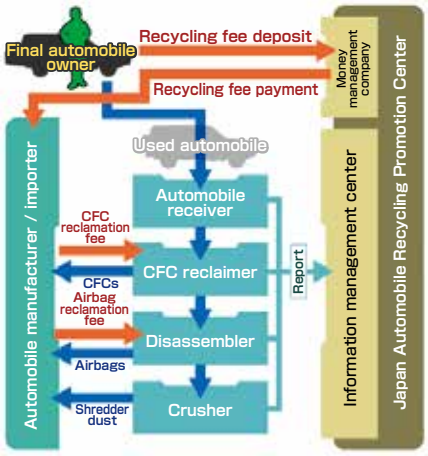
(2) Creation of vehicle recycling system

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 of these efforts the nationwide number of improperly stored vehicles was 4,600 at the end of 2017 (a decrease of 97.7% versus the number in 2004), and the number of illegally dumped vehicles was 599 (a decrease of 97.3% versus the number in 2004), succeeding in both dramatic reductions.

●Act on Recycling, etc. of End-of-Life Vehicles system



Source: MLIT (Tentative Translated 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 country with eminent naval forces 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.

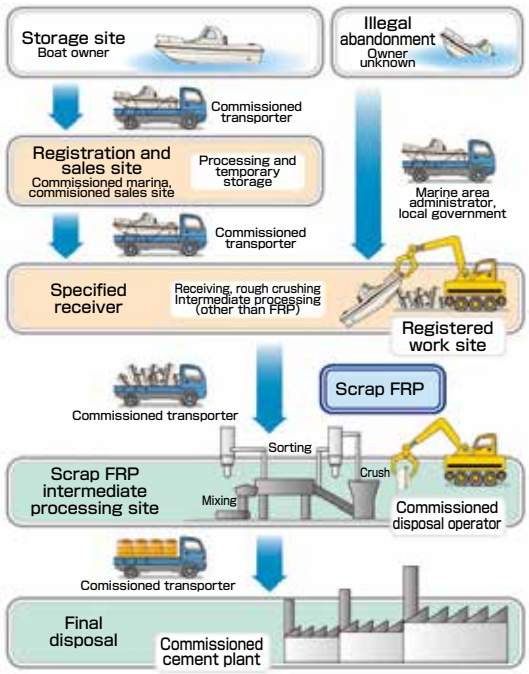
In March 2019, Japan became a signatory and, in May 2019, held an international seminar on ship recycling at the IMO headquarters in London, in conjunction with the IMO, to help spur an international movement towards rapid adoption of the Ship Recycling Convention. Japan has also taken advantage of opportunities such as courtesy calls and talks to urge major ship-dismantling countries such as India to promptly become signatories. Japan has provided India and other dismantling countries with ship recycling facility improvement support through ODA.

Due to these efforts, in 2019, eight other countries, including the chief ship-dismantling country of India, became signatories. The enforcement requirements of the treaty include: (1) signing by at least 15 countries; (2) the combined merchant fleets of the signed countries is at least 40%; and (3) the signed countries' combined maximum annual ship recycling volume in the past 10 years is at least 3% of signed countries' merchant shipping volume. The status of fulfillment as of the end of January 2020 is (1) 15 countries, (2) 30.2%, and (3) 2.6%*2 respectively.

On the other hand, the FRP (fiber-reinforced plastic) used in pleasure boat hulls is extremely difficult to recycle. Due to this, at information and opinion sharing events held by the District Transport Bureau, the Regional Development Bureau, and prefectural governments, Japan has striven to raise awareness and understanding of the "FRP Boat Recycling System" operated by the Japan Marine Industry Association in order to promote appropriate recycling of used FRP hulls.

*1 Ships which have reached the end of their lifespans are disassembled and the majority of the ships' materials are used for steel.
*2 Calculated using 40% of global merchant fleets in 2017.

●FRP boat recycling system



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

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

(1) Measures by local governments

Local governments are implementing global warming countermeasures, tailored to their local features, in the transport and traffic sectors. This section looks at efforts by Fukui Prefecture, Himeji City (population: 530,000) and Oita City (population: 470,000).

■Fukui Prefecture - Creating a society that doesn't depend excessively on cars

Fukui Prefecture has one of the most automobile-dependent society in Japan. As this excessive dependence is implicated in the problems of increasing global warming and the decline of public transport, the "New Century Fukui Lifestyle Transport Vision", which was established in 2002, advocates for the creation of a society where automobiles and public transport coexist, and efforts to revitalize public transport are being carried out. Currently, based on the prefectural governor manifesto, "mobility management" (the optimal usage of transport means), which includes track-sharing by different railway companies, the extention of station-front lines and a "Car-Saving Strategy", is being progressed and policies for lowering the strain on the environment and expanding usage of public transport are being strengthened. These initiatives have also been adopted into the "Fukui Prefecture Environment Fundamental Plan" that was revised in 2013.

As a part of these initiatives, in 2011 the "Fukui Prefecture Citizen Meeting on Promoting the Creation of a Society that Doesn't Depend Excessively on Cars" was established, consisting of academics, experts, transport companies and representatives of the prefecture, cities and towns. Based on an action plan formulated in 2011, they are undertaking a variety of work for preventing the increase of greenhouse gas particle emissions and the decline of public transport institutions through the appropriate usage of automobiles and public transport.

● Track-sharing by different railway companies

Source: Fukui Prefecture

■Himeji City
-Urban Development Based on Public Transport (Railway and Buses)-

In Himeji City, "Himeji City Integrated Transport Plan Based on Public Transport" was formulated in August, 2008, and relevant departments are promoting the various policies. By promoting the foregoing plan, the goal is to increase the users of public transport which are on a downward trend and to maximize the effect from 3 perspectives, namely "economy," "safety and security", and "environment," such as by alleviating traffic congestion in the city center and CO_2 reduction in the transport sector. According to this plan, the policies are being developed based on the following 3 policy pillars, i.e. "improvement in the user-friendliness of public transport," "improvement in the usage environment" and "promotion of participation and cooperation"

Improvements in transport hubs and passenger terminals in areas surrounding the station including the development of new stations are being implemented, as well as operation of community buses in remote islands. Particularly around JR Himeji Station, development of a public square in front of the station is underway with a dramatic increase in environmental space and passage of general vehicles are regulated in transit malls. In addition, a share cycle system has been introduced, as a secondly means to promote public transport.

A bus location system has been introduced for fixed-route buses and improvements are being made in cooperation with transport operators such as IC tickets for railways and fixed-route buses, etc.

With emphasis on the promotion of public transport usage and triggered by West Japan Railway Company's transport improvement project and trial increase in the number of services, JR Kishinsen has begun a "3-million passengers challenge campaign" with towns along the route and business operators, exerting continuous effort to achieve increase of passengers while utilizing local resources. Moreover, each year, public transport classwork are being held by transport operators with elementary school children as the target to prepare the next generation with regard to this endeavor.

● Himeji Station North Public Square and Transit Mall (World Heritage Site and National Treasure Himeji Castle shown in the front)

Source: Himeji City

■Oita City
-Lively community development through environmentally friendly transport-

In Oita City, as part of the Oita Station southern area redevelopment project, the plazas in front of Oita Station, to its north and south, were improved. This smoothed the process of transferring between rail, buses, and taxis, enhancing the station's functionality as a transport hub. Furthermore, the Symbolic road in front of the station was also improved. Together with the track elevation and station building construction, this completely changed the station area. There was a need to perform urban planning to compact the area's functions, making it more convenient, and calls to create a public transport network that offered comfortable transport, together with road improvements.

In March 2017, the "Oita City local Public Transport Network Development Plan" was formulated with the goal of creating a sustainable local public transport network. It clarified the public transport ideals and the roles of city residents, transport operators, and government offices. They are now collaborating together to implement the plan.

● View of the station's symbolic road from JR Oita City Rooftop Square and the south exit of Oita Station

(2) Measures by companies in the transport sector

①Aviation companies

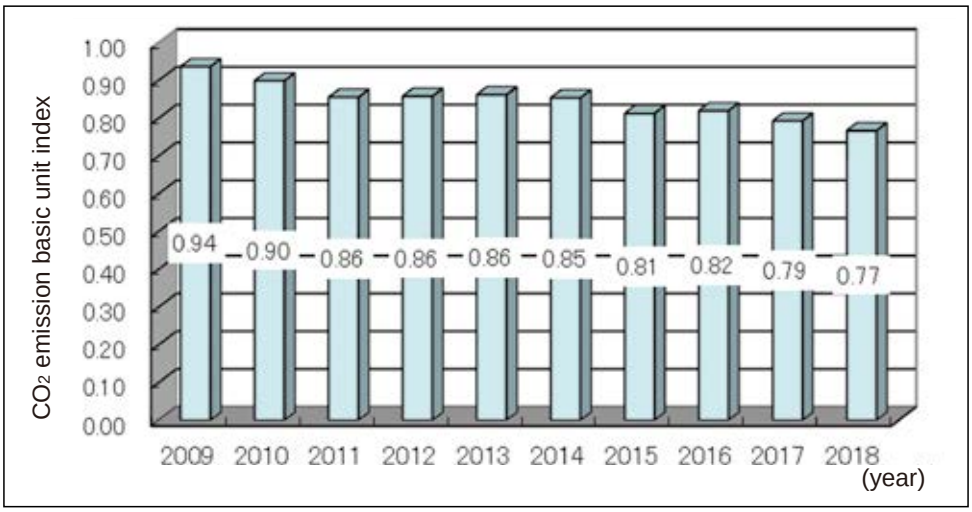
The Scheduled Airlines Association of Japan, a Japanese association of air transport operators, has implemented environmental measures. Major measures are the following.

○Global warming prevention targets:

Target: Reduce energy consumption base units in 2020 by 21% in comparison to 2005

CO_2 emission basic units: 0.00095t-CO_2/RTK (revenue ton-kilometers)

Achievement: Reduce energy consumption base units in 2018 by 23% in comparison to 2005



Source: The Scheduled Airlines Association of Japan (Tentative Translated by Eco-Mo Foundation)

Contents of measures:

- Introduce new high fuel efficiency airplanes
- Using area navigation etc, a high-precision navigation method, to reduce flight distances and times
- Reduce weight of loaded articles (reduce weights of cargo containers and in-flight meal facilities, optimize amounts of fuel and drinking water)
- Recover engine performance and improve fuel efficiency by cleaning engines
- Working with related parties to identify issues involved in introducing alternative fuels and considering measures for resolving these issues

○Support for the creation of a recycling-oriented society

Target: Lower industrial waste final disposal rate to 2.4% or below for 2020

Achievement: Industrial waste final disposal rate in 2018 was 5.1%

Contents of measures: Promote garbage collection by type, promote reuse and recycling, and select waste processing companies with resource recycling technologies, etc.

○Environmental awareness raising activities

- Participation in forestation activities around airports nationwide, participation in coral planting in Okinawa, and development of eco-tours related to the above activities.
- Hold environment seminars by pilots to raise the environmental awareness of children, who represent the future.

②Railway companies

The Association of Japanese Private Railways, an association of railway operators in Japan, has formulated "Commitment to a Low Cabon Society" and carried out the following principal measures as part of this plan.

Target: Reduce power usage basic units in 2020 by 5.7% in comparison to 2010

Reduce power usage basic units in 2030 by over 5.7% in comparison to 2010

Contents of primary measures:

○Introduction of energy saving (railway) cars

Energy saving trains such as VVVF controlled trains, which consume less power, and regenerative brake-equipped trains, which efficiently use power, are being introduced.

●Rates of introduction of energy saving cars by 16 major private rail companies (as of March 31, 2019)

	Control method	No. of cars owned	
			Number of reduced weight cars
Cars with regenerative brakes	VVVF control	12,121 cars*	10,920 cars
	Chopper control	2,127 cars*	1,046 cars
	Resistance control, other	602 cars*	213 cars
Cars without regenerative brakes	Resistance control, other	2,365 cars	296 cars*
Total number of cars owned		17,215 cars (A)	12,475 cars
Number of energy saving cars (trains with regenerative brakes or reduced weight cars)		15,146 cars (B) (total of cars indicated with a *)	
Share of energy saving cars		88.0% (B/A)	

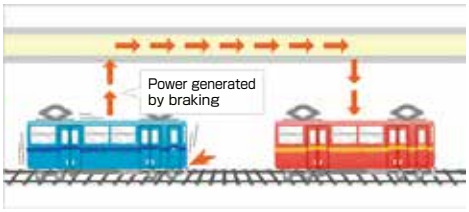
Note 1: As a general rule, only commercially used cars are included (funicular lines and new transport lines are not included)

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

Source: The Association of Japanese Private Railways (Tentative Translated by Eco-Mo Foundation)

○Usage of energy saving systems (regenerative brakes, regenerated power storage devices)

Trains with regenerative brakes, which generate power when braking and return the power to the overhead power lines for re-use, are being actively introduced.

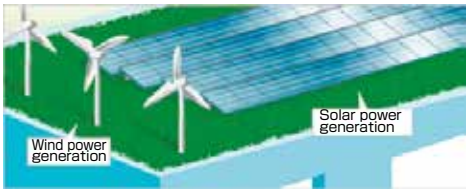


○Noise and vibration reduction

Efforts to reduce noise and vibration include the introduction of reduced noise trains, the use of long rails to reduce the number of rail joints, the use of synthetic crossties, and the installation of elastic material such as rubber between concrete railbeds and crossties.

○Use of natural energy

Solar panels and wind power generators are being installed on the roofs of stations, using sunlight and wind to generate the power used by the station.



Source: The Association of Japanese Private Railways (Tentative Translated by Eco-Mo Foundation)

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

Contents of measures:

・Promote introduction of low-emission vehicles

◇Provide aid for the introduction of CNG vehicles and diesel hybrid vehicles

◇Distribute pamphlets, etc. which raise awareness of replacing vehicles with low-emission vehicles

・Promote eco-driving

◇Hold eco-driving training sessions and promote attendance at the said sessions

◇Distribute energy saving driving manuals, energy saving driving recommendations, eco-driving promotion notebooks and eco-driving promotion manuals by data download from website

◇Provide subsidies for the introduction of devices which support the shutting off of engines when parked

Provide subsidies for the acquisition of vehicle-mounted heating and cooling devices (air heater, truck battery driven coolers) which can be used continuously for long periods of time when engines are stopped during truck driver breaks, when waiting for cargo to be loaded, etc.

■Nihon Bus Association

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

Target:

○Cut CO_2 emission intensity in 2030 by 6% in comparison to 2015.

○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. The association is also actively equipping buses with devices which contribute to eco-driving, such as start-stop (idling-stop) devices and digital drive recording devices.

・Promotion of introduction of high fuel efficiency buses

When purchasing new vehicles, national, local government, and Nihon Bus Association subsidy systems are used to actively strive to deploy hybrid buses and high fuel efficiency buses.

・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

・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.

■Example of initiatives by companies: Miyazono Bus Co., Ltd.

Implementing effective activities through business site autonomy and head office follow-up

The Miyazono Group was created in 2000 as "Miyazono Fukushi." In 2020, as it approached its 20th anniversary, it was renamed "Miyazono Bus."

The Miyazono Group is a long-time contributor to social welfare. For example, in 1975, it was the first company in Japan to hire persons with disabilities to be taxi drivers. Miyazono Bus shares that same spirit, providing services that are there for people, such as transport to and from special needs schools and senior facilities, as well as the operation of tourist buses with lifts. It also takes the lead in other activities, led by the belief that environmental and safety measures are essential aspects of the company due to the nature of its business activities.

<"Implementing effective measures through the acquisition of transport-specific certifications">

Miyazono Bus is deeply rooted in the society around it. We operate welfare busses that provide transport assistance to the elderly and people with disabilities, private patient transport for non-urgent medical situations, and proxy driving and operation management for customers' private vehicles. In addition to our firm conviction that accidents must never occur, we believe that among the corporate social responsibilities of passenger transport providers is environmental conservation through the reduction of exhaust gas emissions. Furthermore, as an enterprise, we must eliminate wasteful expenses and achieve stable company operation. We have therefore placed especially great importance on our environmental and safety measures. Together with the other companies in our Group, we have acquired Green Management Certification with the expectation of achieving even greater results in the future.

Many tourist busses with lifts

<"Promoting autonomous activities by individual business sites, led by promotion council members">

Under the company's environmental activity promotion structure, the president is the environmental conservation manager and each business site manager is an environmental management director. There are four promotion committee members from each site who act as leaders and issue instructions to bus and business site staff. They hold environmental and safety workshops for the promotion committee, and promotion committee members convey the knowledge they obtain through these workshops to drivers through the safety training performed at individual business sites. Safety training sessions are voluntarily conducted study sessions concerning safe driving. All drivers are required to attend training once per month. Due to the nature of the company's operations, not all drivers can gather at one time, so multiple training sessions are held to ensure that everyone can attend.

The contents of these safety training sessions are diverse, including how to practice eco-driving and how to perform inspections and maintenance. We use instructional materials such as DVDs, and video from drive recorders is shared to improve drivers' safe accident avoidance mentality. Eco-driving is essential for ensuring the safety and comfort of passengers, so it is one of our core initiatives, and the "10 Tips for Eco-driving" are posted in the company's roll call areas. Every month, we also publish a company newsletter with information about safe driving and environmental conservation. These newsletters are distributed during safety training and used as instructional materials. The company newsletters are made by the promotion committees of individual business sites. This makes it possible to address issues and topics specific to each site, and helps expand the knowledge of promotion committee members. They struggle to find topics to write about, but this provides opportunities to learn new things.

<"The head office provides extensive support to business sites. The environmental and safety results are immediately apparent.">

We gather driver and vehicle operation data from daily drive records. Input staff enter the information into a system every day. The information is tabulated by the head office, and the tabulated information is provided to the sales sites in monthly reports. The number of kilometers driven and the fuel efficiency are clearly indicated on a per-driver, per-vehicle, and per-business site basis. This information is also posted on-site and used in safety training, and drivers are instructed to review and reflect on their own driving. We create an environment in which there are always opportunity to learn, such as by posting environmental and safety-related posters in offices and break rooms, where drivers can learn from them. Fuel efficiency has remained roughly the same as before acquiring Green Management Certification, improving by 1%, but we see this as maintaining an already high level of fuel efficiency.

The head office also checks the data for all vehicles. When it finds vehicles with poor fuel mileage, it shares this information with the promotion committee, has the company repair shop, located in the Edogawa business site, investigate the cause of the problem, and rapidly addresses it. This makes it possible to rapidly rectify vehicle problems and helps prevent breakdowns. If there are no problems with the vehicles themselves, the drivers are given personal instruction. These activities also contribute to driving safety. In the first year of Green Management Certification, the number of accidents fell by 43% compared to the previous year, and there were zero accidents involving injuries. It is immediately apparent that the promotion of Green Management Certification, which includes not only driving but also inspection and maintenance, has had a positive influence on environment and safety.

We are also implementing measures to eliminate waste that is not related to driving, such as conserving water when washing buses or setting air conditioners to appropriate temperatures. At first, these measures had difficulty taking hold, but in addition to oral instruction, we also posted signage near faucets and control panels. It appears that as a result of these unflagging efforts, these measures are gradually becoming more firmly established.

<"Becoming essential by maintaining [Green Management Certification] and fostering mutual understanding with the community">

Six years have passed since we received certification. We are still midway through implementing measures, and we know that there is much left to be done. For example, currently digital tachographs and drive recorders are only installed in tourist buses, but the objective evaluations of the output daily reports have clearly improved the mentality of drivers and been effective in making driving safer and more economical. We are now moving forward with plans to deploy this throughout the company. We also plan to replace vehicles with more fuel efficient vehicles.

Our business is intimately tied in to society, and welfare buses will come to provide even greater value with the coming of the super-ageing society. This is why we believe that environmental and safety measures through Green Management Certification will become even more essential in the future.

We have bus depots within the city limits, and we do business with the understanding of members of the community. In order to deepen our relations with the surrounding community, each of our business sites holds events such as mochi rice cake making events and barbeques, which are attended by many community members.

In addition to providing the community with greater opportunities to learn about our company and what we do, it also enables us to gather frank feedback about their everyday experiences and thoughts. We use this valuable information in our environmental and safety activities. We consider fostering deeper mutual understanding to be an important activity, and we aim to become a company that society relies on.

Deepening mutual understanding through interaction with the local community

■Japan Federation of Hire-Taxi Associations

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

Target level:

○2020 target (total volume of emissions target)

Reduce CO_2 emissions by 20% in comparison to 2010.

○2030 target (total volume of emissions target)

Reduce CO_2 emissions by 25% in comparison to 2010.

Basis used to establish targets:

○2020 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.

○2030 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 2020 30%,by 2030 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 federation is promoting the elimination and suspension of vehicles in order to eliminate excess supply.

・Taxi usage promotion

◇The federation is promoting universal driver training and cultivating high quality drivers.

◇The federation is striving to improve user convenience and promote taxi usage by improving taxi stands and promoting the deployment of advanced technologies such as smartphone-based technologies.

◇The federation is working to expand shared taxi use and reduce the amount of private car usage.

・Enrichment of and PR for sightseeing taxis

◇The federation is striving to enrich and engage in 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

◇The federation is promoting 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 are being issued to related organizations to establish and improve taxi pools in order to reduce the amount of unoccupied taxi operation.

・Eco-driving

◇The federation is working to ensure 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.

◇The federation is promoting 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

◇The federation will use 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 conpanies

The Japan Association of Refrigerated Warehouses is continuing its efforts to reduce "CO_2 emissions and energy usage" in 2019 as well, through measures such as: ① Acceleration program (subsidizing 1/3 of project costs) of the introduction of energy-saving natural refrigeration equipment for the early realization of a CFC-free and low carbon society, and promote energy-saving machines that don't use CFC, ② carrying out "Energy usage fact-finding studies" and "Coolant studies" to collect basic data related to CO_2 emissions reductions, and ③ 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 (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. These transport measures and events, which began in Europe, have spread to roughly 2,000 cities around the world, linked by a common objective and working at the same time in a global environmental and transport event. In 2019 13 cities in Japan participated. (Sendai City*, Saitama City, Yokohama City*, Zushi City*, Matsumoto City, Kanazawa City, Fukui City*, Toyohashi City, Kyoto City*, Osaka City*, Nara City, Fukuyama City*, Naha City*.

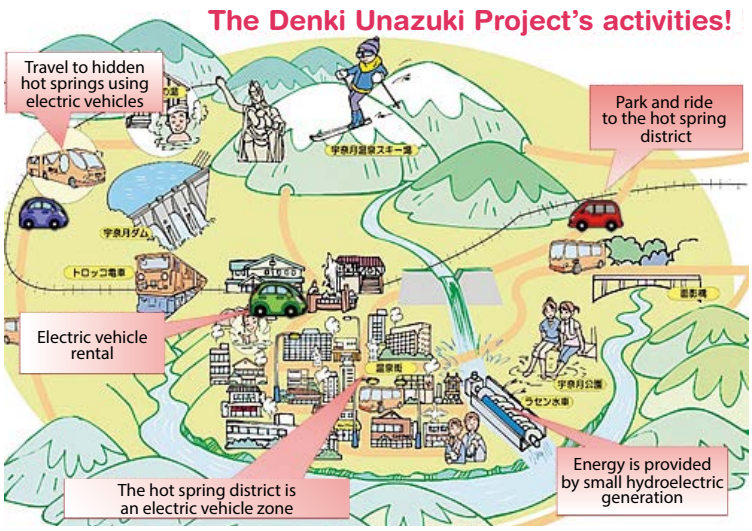
＊Citizen group-sponsored; Those unmarked are local government-sponsored. Secretariat : Car Free Day Japan

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.

The Denki Unazuki Project Planning Committee (in Toyama Prefecture) was established in July 2009, and with the cooperation of community residents, it has carried out activities aimed at creating a natural energy public transport system that exists in harmony with the rich natural environment though measures such as small hydroelectric generation, with the aim of achieving local consumption of locally produced energy. In July 2013 the unincorporated association became the Association of Denki Unazuki Project.

At the Unazuki Hot Spring, it introduced a public transport project using renewable energy such as small hydroelectric generation and Green Slow Mobility (eCOM-8 low-speed eight wheel electric community vehicles, known as "EMU"). The Association is working to attract tourists to Unazuki Hot Spring, which has flourished as an advanced eco-hot spring resort as the result of this power development, and to promote autonomous community development from the perspective of local consumption of locally produced energy.



Source: Denki Unazuki Project website (Tentative Translated by Eco-Mo Foundation)

Column

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

The Nationwide Bus Map Summit is held roughly once a year by the Nationwide Bus Map Summit Planning Committee, which is composed of citizens' organizations and other bus map creating organizations.

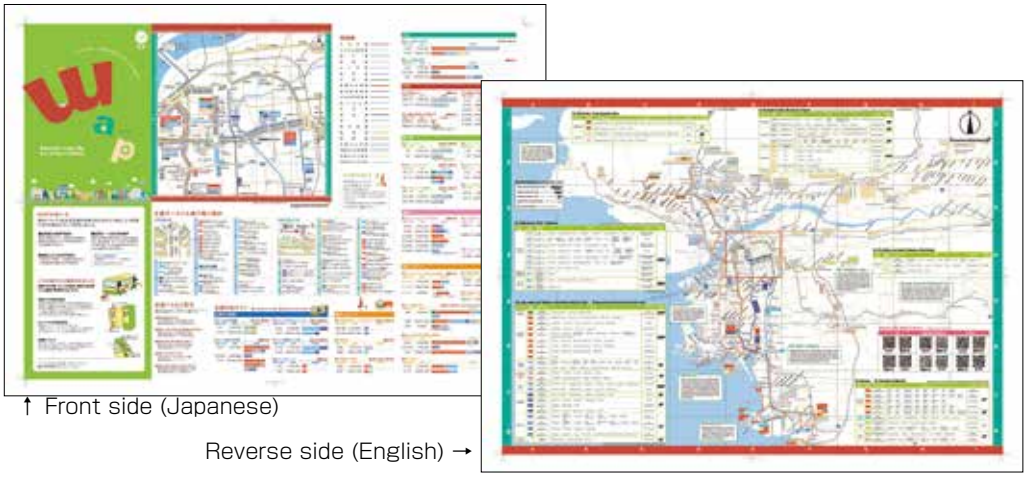
Approximately 100 people from across Japan participate in each summit, from citizens, transport operators, and government officials to, in recent years, a broad range of organizations and people that deal with transport information such as open data. They engage in passionate discussions about topics ranging from map creation to the overall transport information that forms the foundation of MaaS.

●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.
Wakayama	Wakayama City Planning Council - Wakayama Komachi	wap
Matsue	Project UI NPO Inc.	Doko Demo Bus Net Doko Demo Bus Book Doko Demo 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 Translated by Eco-Mo Foundation)

●Bus maps example (wap)



↑ Front side (Japanese)

Reverse side (English) →

Source: Wakayama Transport Machizukuri Council — Wakayama Komachi

(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 between certified companies, society, and 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. As of the end of 2019 there are 3,402 certified businesses and 6,685 certified business sites. These are indicated as "Environmentally-friendly transport operators" on the Eco-Mo Foundation website, and each month press releases are issued to newspaper companies containing newly certified businesses. Vehicles owned by certified truck, bus, and taxi operators account for between 11.3% and 16.0% of the vehicles owned by companies 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, 2019	Companies Nationwide	Percentage Owned by Certified Companies	Notes
Trucks	145,047	1,282,069 (Note 1)	11.3%	(Note 1): Number of vehicles owned as of the end of March 2018. This includes the number of commercial trucks (excluding trailers) and the number of commercial special purpose vehicles as indicated in the "Transport Statistics Collection" (from the MLIT). It does not include the number of registered light trucks.
Buses	15,566	116,181 (Note 2)	13.4%	(Note 2): Number of vehicles owned as of the end of March 2018. Based on the "Transport Statistics Collection" (MLIT).
Taxis	32,015	199,909 (Note 3)	16.0%	(Note 3): Number of corporate taxis owned as of the end of March 2018. Based on information on the Japan Federation of Hire-Taxi Associations website

■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 2007 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 2008 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 Regional 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 (Chuo-ku, Tokyo; Shinjuku-ku, Tokyo; Sumida-ku, Tokyo; Katsushika-ku, Tokyo; Yokohama City, Kanagawa Prefecture; Ina City, Nagano Prefecture; Shiojiri City, Nagano Prefecture and a local government)

Industry group

Japan Association of Refrigerated Warehouses and 37 prefectural Trucking Associations (Hokkaido, Aomori Prefecture, Iwate Prefecture, Akita Prefecture, Fukushima Prefecture, Ibaraki Prefecture, Tochigi Prefecture, Gunma Prefecture, Saitama Prefecture, Chiba Prefecture, Tokyo Metropolis, Kanagawa Prefecture, Niigata Prefecture, Yamanashi Prefecture, Nagano Prefecture, Fukui Prefecture, Gifu Prefecture, Shizuoka 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 establishment 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, consist of various transport operator organizations, economic organizations, related government bureaus, and other organizations, acts as its certification body. The MLIT and the Eco-Mo Foundation jointly operate the certification system as the secretariat. By the end of December 2018, 737 business sites have been certified.

Certified business sites implementing best measures may also be recommended for MLIT awards. In 2019, ONOGUMI Inc. and the Kagamiyama School District Self-Governing Association/Kyoto City's Yamashina Ward Office were selected as the winners of the "2019 Minister's Award for Excellent Business Implementing Traffic-Related Environmental Conservation Efforts".

●ONOGUMI Inc.

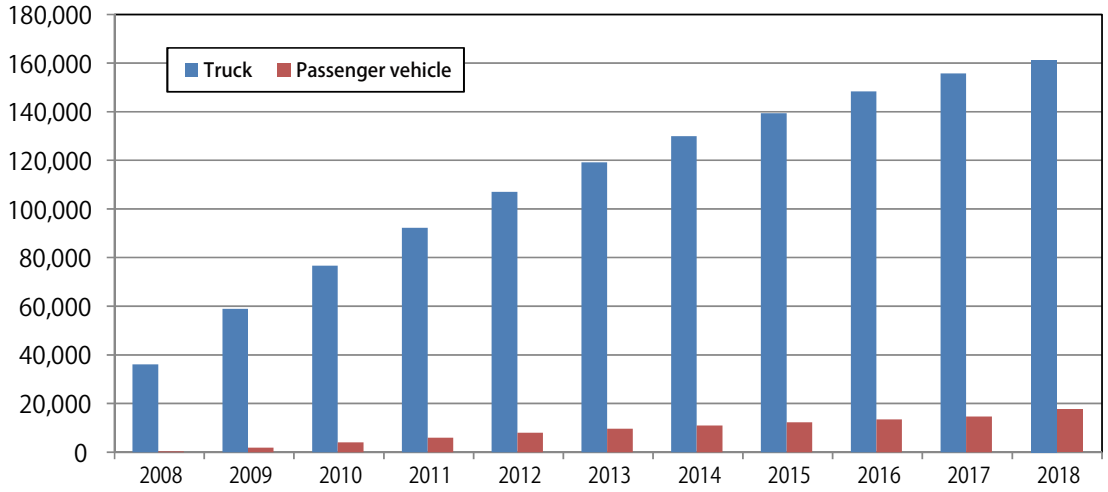
●Kagamiyama School District Self-Governing Association/Kyoto City's Yamashina Ward Office

③Promotion of eco-driving

The Eco-Mo Foundation acts as the secretariat of the Eco-Drive Promotion Implementation Council (consist of 16 transport related organizations), established based on the results of the "COP3 to the UNFCCC" held in Kyoto in 1997. It also carried out various unique eco-driving promotion activities. 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 2011 it has also held the "Eco-Drive Activity Contest" with the support of the Eco-Drive Promotion Liaison Committee (consist of the NPA, METI, MLIT, and MOE) and the Eco-Drive Promotion Implementation Council. Since 2014 Minister of Land, Infrastructure, Transport and Tourism Award (transport business category) and Minister of the Environment Award (general category) have been conferred, and the award ceremony for top winners was held as part of the "2019 Eco-Drive Symposium" on November 27.

●Accumulated number of completed certificates issued



●2019 Eco-Drive Activity Contest award ceremony

●Contest leaflet

④Promotion of Environmentally Sustainable Transport (EST)

The OECD has proposed Environmentally Sustainable Transport (EST) (see page 39), 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 2006 the Eco-Mo Foundation has worked with academic experts, related groups, EST related ministries and agencies, and other organizations to promote EST.

Submissions for the 10th EST Transport Environment Awards, recognizing exceptional regional transport environment efforts, were accepted. The 2019 MLIT's Minister Award, the grand prize, was awarded to the Shodoshima Regional Public Transport Council and the 2019 MOE's Minister Award was awarded to the Joint Minato Town Planning Network/Aizuwakamatsu City. In May, an award ceremony and symposium (the 12nd EST Promotion Forum) was held in Tokyo. In 2019, the Eco-Mo Foundation collaborated with the Regional Transport Bureau in holding workshops for local governments and transport operators (EST Emergence Seminars) in Oita City. In addition to these workshops, tours and review sessions were also held as part of a three day personnel development training session (the 9th such session) in Aizuwakamatsu City.

●10th EST Transport Environment Award results

Award	Recipient	Name of Main Project
Grand Prize	[MLIT's Minister Award] Shodoshima local Public Transport Council (Tonosho Town and Shodoshima Town, Kagawa Prefecture)	"Taking on the Challenge of Sustainable, Environmentally-friendly Public Transport Reconstruction in Shodoshima"
Grand Prize	[MOE's Minister Award] Joint Minato Town Planning Network/Aizuwakamatsu City (Aizuwakamatsu City, Fukushima Prefecture)	"Using Renewable Energy and ICT to Sustainably Support Transport Development in Hilly Areas"
Outstanding Performance Award	Oita City (Oita City, Oita Prefecture)	"Development Lively Towns through Environmentally-friendly Transport"
Incentive Award	Association for Promoting Eco-Transport in Toyota City (Toyota City, Aichi Prefecture)	"Ongoing Implementation of Toyota City Transport Demand Management Measures for Twenty Years and Beyond"
Incentive Award	Koto Area Public Transport Vitalization Council (Hikone City, Aisho Town, Toyosato Town, Kora Town, and Taga Town, Shiga Prefecture)	"Ten Years of Initiatives for Promoting the Use of Public Transport and Increasing the Number of Public Transport Users through Coordination between Multiple Cities and Towns in the Koto Area"
Incentive Award	Society for Researching the Supply of Traffic Information in the Event of a Disaster (Kure City, Hiroshima City, and surrounding areas, Hiroshima Prefecture)	"The Construction and Deployment of a Real-time Transport Information Provision System Following the Torrential Rainfall of July 2018"

●Shodoshima public transport "Olive Bus" (Shodoshima local Public Transport Council)

●The Minato area's "Minato Bus" (Joint Minato Town Planning Network/ Aizuwakamatsu City)

⑤Promotion of mobility management education (Transport Environment Education)

In order to promote mobility management education, the Eco-Mo Foundation provides support to local governments and elementary and junior high schools, creates centers for ongoing education, publishes educational manifestos to serve as guidelines, publishes textbooks, and engages in other education promotion activities.

Regarding support for the local government, support continue for Shiga Prefecture and start for Hachinohe City and Urasoe City.

<Supporting local government initiative>

Shiga Prefecture : Apart from the visiting lecture conducted primarily by the prefecture, programs that are easy to put into practice by the teaching staff associated with the subject were also developed and classes were carried out at 26 schools in 9 local municipalities.

Hachinohe City : The city developed a program for active and autonomous involvement by teaching staff, created supplementary teaching materials, and deliberated regarding how to create a system that would be continuously implemented.

Urasoe City : The government created ICT instructional materials and a curriculum so that students in elementary schools could learn about public transport, and deliberations were carried out with the aim of implementing this education in all eleven schools in the city.

In addition, support has also been provided to the following 13 schools.

●Names of supported schools and educational themes

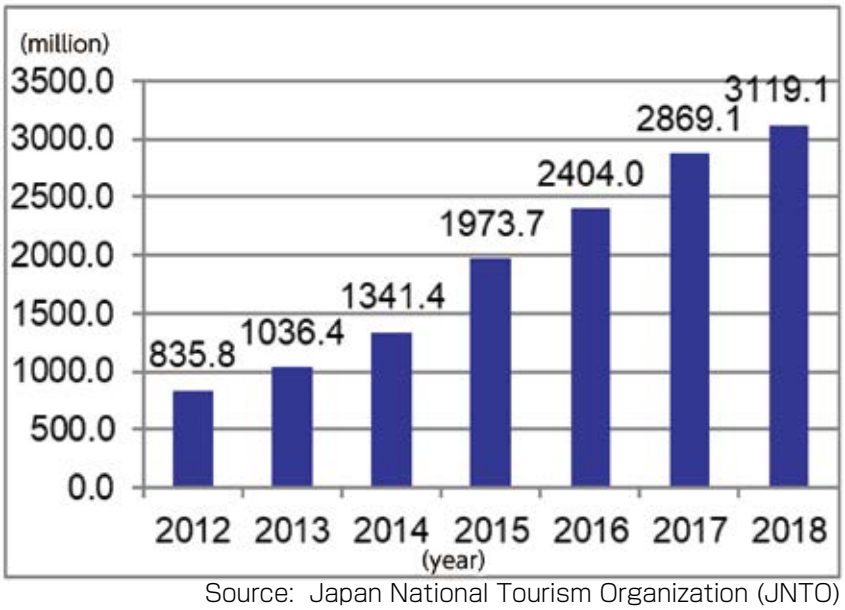
School	Theme	Subject
Nohoronooka Elementary School, Sapporo City	Integrated studies - "Nohoronooka Public Transport Investigation Team!"	Integrated studies
Sapporo Elementary School attached to Hokkaido University of Education	Carrying Out Mobility Management Education in Fifth Year Elementary School Social Studies	Social studies
Akeno Elementary School, Tomakomai City	Vertically-structured Off-campus Activity	Integrated studies
Yumoto No. 3 Elementary School, Iwaki City	Environmentally-friendly Town Planning	Social studies
Joetsu University of Education-attached Elementary School	"Station Town Joetsu"	Integrated studies
Otemachi Elementary School, Joetsu City	Our Beloved Takada	Social studies, integrated studies
Hamamatsu Gakugei Junior High School	Tenhama Line Spontaneous Support Squad (project for communicating the allure of areas along the train line)	Exploratory activities
Kawase Elementary School, Hikone City	Town Facilities Everyone Uses	Life studies
Momoyama Junior High School Attached to Kyoto University of Education	Study of Balancing Tourism and the Environment as Seen through Area Pricing	Social studies
Doshisha Junior and Senior High School	Junior High School Movement to Invigorate the Station and the Community - Eizan Electric, Hachiman-mae Station Project	Special studies
Hokuyo Elementary School, Izumo City	Integrated studies - Local Revitalization Project - Sharing the Allure of the Hokuyo Area through the Ichibata Electric Railway	Integrated studies
Hokubu Junior High School, Kumamoto City	Activity Implementation and Ethics Class Research from the Perspective of ESD	Ethics
Genyo Junior High School, Saiki City	Education for Public Transport and Sustainable Development in Provincial Cities (ESD)	Social studies

⑥ Regional promotion of the smooth mobility of foreign tourists

In the "Tourism Vision to Support Tomorrow's Japan" that was established in 2016, the Japanese Government released the clear goals of 60 million foreign tourist visitors and 15 trillion yen in the consumption annually in 2030, and these numbers are being aimed for through various efforts.

As a result of these efforts, at the end of 2018 the annual number of inbound tourists exceeded 30 million annually for the first time and the number of foreign tourists continues to increase each year. On the other hand, foreign independent tours (FIT) in which travelers make independent airline and accommodation reservations are increasing and the need for an improved environment to enable smooth and comfortable mobility for such independent travelers is an urgent issue.

●Transition of inbound foreign tourists



Source: Japan National Tourism Organization (JNTO)

Thus, from 2017, we are supporting the funding, know-how and consensus-building of two groups that are improving transport means and enriching guide information for smoothly moving foreign tourists.

In April 2017, we publicly invited support groups and received 22 applications from around the nation. Two support groups were selected by the "Committee for the Promotion or Smooth Transport for Foreign Tourists in Various Areas" (Chairman : Haruno Ishida, Specially - appointed Professor of University of Tsukuba) which had been established within this Foundation. Support was provided until the end of March 2020.

●The work of the support groups

Group	Project name and summary of 2019 work
Tokachi Area Intermodal Passenger Transport Vitalization Promotion Council	Tokachi Area Project for the Smooth Transport of Foreign Tourists.
	We created multilingual signage for bus stops, revised the signage used on ticket machines for airport buses, and rode on buses to monitor conditions and to verify and evaluate the results of these activities.
Miyoshi City	Miyoshi City "Sennen-no-kakurenbo Smooth Transport Project for Tourist Areas"
	Along with creating sightseeing and excursion maps for the area around Awa Ikeda Station, we also examined and introduced secondary transport that could be used for tourism.

●Tokachi District Project bus stop signage

●Miyoshi City Awa Ikeda Station Walking Map

⑦Eco-Products 2019 Exhibition

The Eco-Products Exhibition, held annually since 1999 in order to promote environmentally-friendly products and services, is a comprehensive environmental exhibition held at Tokyo Big Sight. It is one of the largest-scale exhibitions in Japan, attended by business persons, members of the government, and general consumers.

The Eco-Mo Foundation has operated booths at the exhibition featuring videos and panels explaining the current state of the global warming issues related to the transport sector, global warming countermeasures, and the activities of the foundation.

(Eco-Products 2019 data: Exhibitors: 515 companies and organizations. Visitors: Approx. 150,000. Eco-Mo Foundation booth visitors: Approx. 4,500)

⑧Promotion of usage of carbon offsets in the transport and tourism sectors

One global warming countermeasure is the use of "carbon offsets", which eliminate or absorb greenhouse gasses to compensate for emissions made elsewhere as the result of the usage of products or services. Product or service users or providers bear the costs of purchasing emissions rights produced elsewhere to compensate for their emissions. In the transport sector, carbon offsets are already being used by airlines, rail operators, bus operators, taxi operators, truck operators, and travel companies.

Carbon offsets don't only highlight the efforts being made by the companies which use them to prevent global warming, but they can also promote voluntary greenhouse gas reductions across a wide spectrum of users, including individuals. They also serve to provide funding to projects for reducing or absorbing greenhouse gasses.

In order to promote greater usage of carbon offsets by the transport and tourism sector, in December 2009 the Eco-Mo Foundation established the "Transport and Tourism Carbon Offset Support System." This system reduces the burden placed on companies in introducing carbon offsets for transport and tourism related services, and makes it possible to calculate CO_2 emissions and purchase emissions rights via the web. The system is already being used by local government transport bureaus and a wide range of companies, including major private rail operators, bus companies, taxi companies, truck companies, and tourism companies.

●Example of carbon offsets using the support systems

Implementing company: Kokusai Motorcars
Name: Environmentally-friendly taxi stand
Overview: A taxi stand exclusively for taxis from Kokusai Motorcars, part of the KM Group, was set up at the main Isetan location in Shinjuku, and the CO_2 emissions for the base fare distance (2km) of each taxi trip departing from the taxi stand was offset by the company

Taxi stand

Leaflet

⑨Promotion 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 2018, efforts have been made to increase the promotion of Green Slow Mobility through national verification experiments, vehicle purchasing subsidies, etc.

The use of golf carts in Wajima City and Ofunato City has been observed, promotion scenarios for a range of uses have been studied, and the results have been presented in a seminar in 2016.

In 2017, a study began of the personal use of golf carts in the U.S., with an eye towards permitting the personal use of golf carts in Japan in the future.

Along with carrying out demonstration experiments in 2018 at the three areas adopted (Yokohama City, Wajima City and Matsue City), test drives were also carried out in areas such as Otaki Town, Toshima and Kyoto City.

In 2019, the Eco-Mo Foundation continued to lend its experimental vehicles, to hold training sessions, and to share its operation know-how.

●Training session - drivers' training (Wajima)

●Training session - driving practice on actual public roads (Wajima)

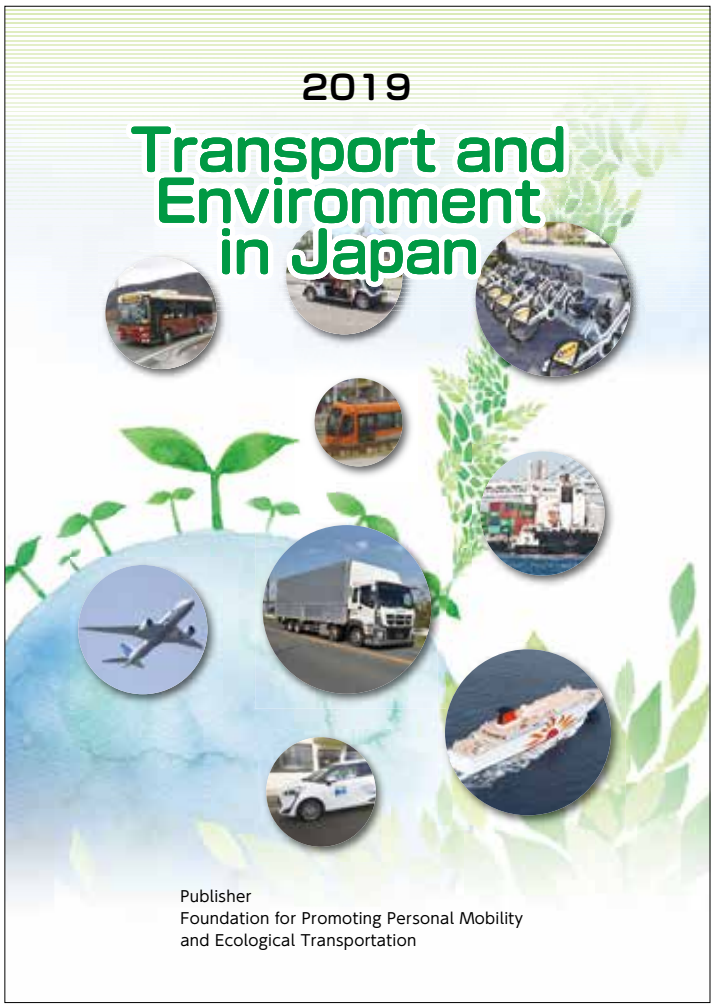
●Training session - keynote lecture (Kiryu)

●Training session - driving practice on actual public roads (Kiryu)

⑩Publication 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 2015 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 2019



Ⅳ. Measures in Response to Other Environmental Issues

1 Noise related measures

(1) Automobile noise countermeasures

A study of motor vehicle noise environmental standard compliance status conducted in 2017 found that of the 8,721,400 homes studied, 532,200 (6.1%) homes had motor vehicle 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. 248,300 homes (2.8%) exceeded environmental noise standards both during the day and at night.

Of the 3,701,600 homes in areas along major arterial roads, 384,600 (10.4%) homes exceeded environmental noise standards during the day, at night, or both. Of those, 175,000 (4.7%) 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 88,000 homes located in these areas, approximately 10,900 homes (12.2%) exceeded environmental noise standards. (Source: Ministry of the Environment "Automobile Transport Noise in 2017")

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

●Nationwide Motor Vehicle Noise Map

Source: NIES

(2) Rail noise countermeasures

In regard to noise from Shinkansen trains, based on "About the Environment Standards Associated with Shinkansen Railway Noise" that was announced by the Environment Agency in 1975, measures, such as setting up and raising soundproof walls, have been carried out in order for the environment standards to be attained.

Of these measures, for the noise associated with the Tohoku (between Tokyo and Morioka), Joetsu, Tokaido and Sanyo Shinkansen lines, the "75 Decibel Countermeasures" are currently being promoted by related government institutions and the operators in order to bring the noise levels down to below 75 decibels in the target areas, which include densely populated areas.

So far, the 75 Decibel Countermeasures have been enforced across stages 1 to 5, and extra measures are being taken for places that exceed 75 decibels in the measurement points of the target areas, as found in a stage 5 survey associated with the Tohoku, Joetsu and Sanyo Shinkansen lines. Also, in places outside the target areas there are still locations that haven't achieved 75 decibels, and so the "75 Decibel Countermeasures" have been promoted to achieve the environment standards.

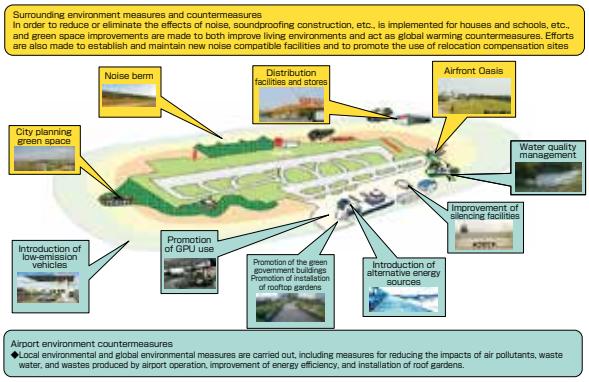
In addition, in regard to noise from conventional railways, based on the "Noise Countermeasure Guidelines Regarding the New Construction or Large Scale Improvement of Conventional Railway Lines" that was notified by the Environment Agency in 1995, measures such as rail welding for long rail have been promoted in order to meet these Guidelines.

(3) Airplane 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.

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.

●Eco-airport conceptual diagram



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

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 Translated by Eco-Mo Foundation)

Japan maintains three large dredging and oil reclamation ships to quickly reach and clean up oil spills in the seas around Japan, and in accordance with the Act on the Prevention of Sea Pollution, a joint public-private oil pollution prevention and cleanup system has been created. Furthermore, Japan, China, the Republic of Korea, and Russia have established a collaborative system for cleaning up large spills of oil or hazardous substances in the seas around Japan, the Sakhalin area, and Okhotsk. The system of international collaboration and coordination is being strengthened through the "Action Plan Area for the Protection, Management and Development of the Marine and Coastal Environment of the Northwest Pacific Region (NOWPAP) Oil and Hazardous and Noxious Substances (HNS) Spill Contingency Plan" (2008).

(2) Countermeasures against harmful aquatic organisms in ballast water

Organisms such as plankton in ship ballast water (sea water used to weigh empty ships for greater safety) can contaminate areas where they are not normally found when ballast water is purged, harming the local ecosystem as well as having negative effects on human health and economic activity. In February 2004 the International Maritime Organization (IMO) adopted the Ballast Water Management Convention in order to regulate ballast water countermeasures using a consistent global standard. Japan became a party to the convention in October 2014.

As of November 2013 nine ballast water management systems have been approved. The first unit of the "JFE Ballast Ace", a ballast water processing system developed by JFE Engineering Corporation and commercially released after being the first system to receive model approval by the MLIT, was installed in August 2010 in the Emerald Leader, a vehicle carrier owned by NYK. Other ballast water countermeasures are also being earnestly implemented. These include the FineBallast®OZ ozone-based ballast water processing system, jointly developed by Mitsui Engineering & Shipbuilding, the Japan Association of Marine Safety, and five other companies, which received approval by the MLIT in June 2011.

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.

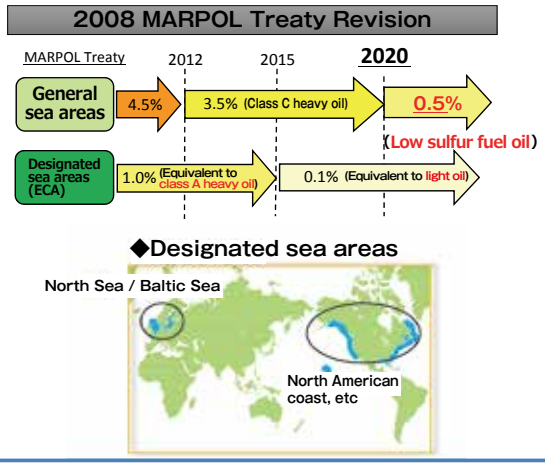
In Japan, in order to smoothly handle the implementation of these strengthened regulations, the shipping industry, oil industry, the MLIT and the Ministry of Economy, Trade and Industry collaborated together and shared a mutual understanding on the range of fuel oil conditions and specifications complying with the MARPOL Convention so that Japanese petroleum suppliers can provide a stable supply of oil while minimizing an impact on ship safety and operation. For that purpose, the trial operation using actual ships was also conducted.

Following the entry into force of the strengthened Sulphur content regulation, operations by the industry is being followed up in order to ensure the smooth implementation of the regulations.

●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.



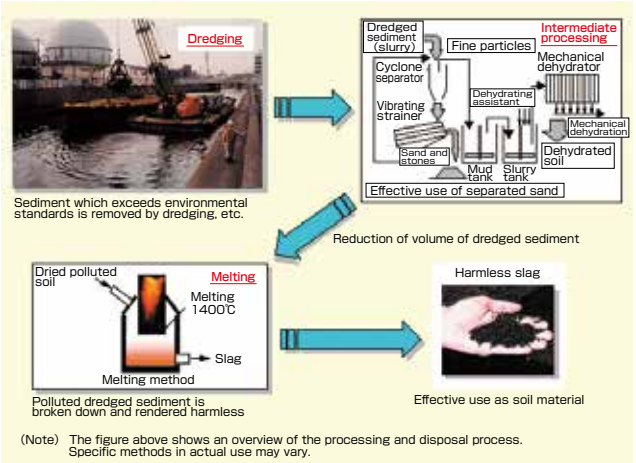
Source: MLIT (Tentative Translated by Eco-Mo Foundation)

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 Translated 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.

●Endocrine disruptor website

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

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.

(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 gasses 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.

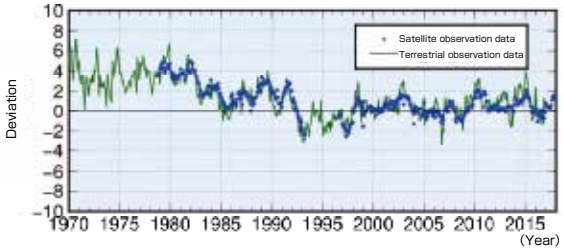
With regard to the recovery of fluorocarbons from vehicle air conditioners and subsequent destruction, due to the fact that vehicle air conditioners are constituent components of automobiles, in January 2005 they were excluded from the scope of the "Fluorocarbon Recovery and Destruction Act", and regulated 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

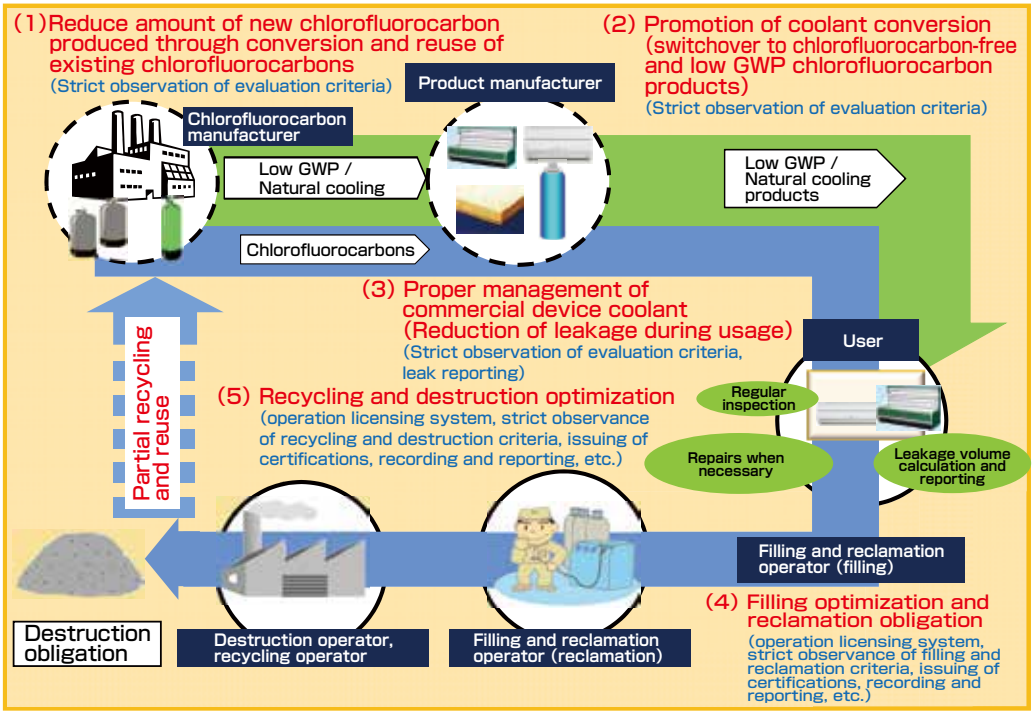
Amount of ozone worldwide

Except for low latitudes, the average amount of ozone worldwide, as measured terrestrially and from satellites, 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.



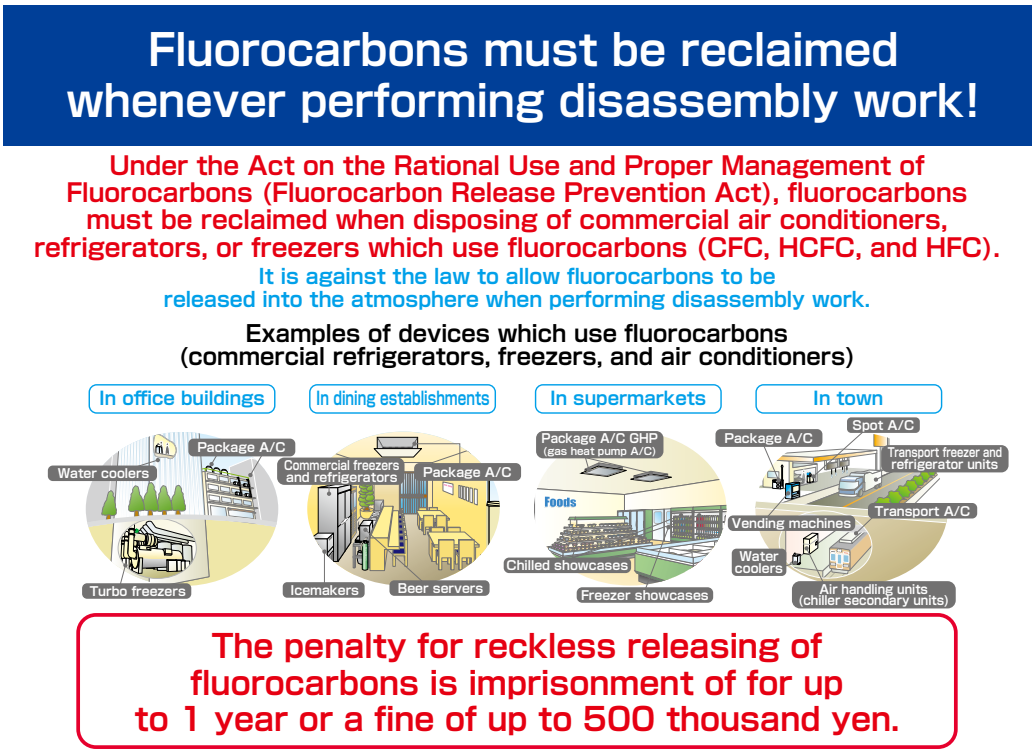
This graph shows the percentage of increase or decrease in the average amount of ozone worldwide compared to the average amount for the 1970 to 1980 period.* These value changes have been adjusted to eliminate the influence of seasonal variation. The solid lines indicate data from terrestrial observation sites, and the dots indicate averaged satellite observation data between N70 and S70 degrees latitude. 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

●Overview of the Fluorocarbon Discharge Prevention Act



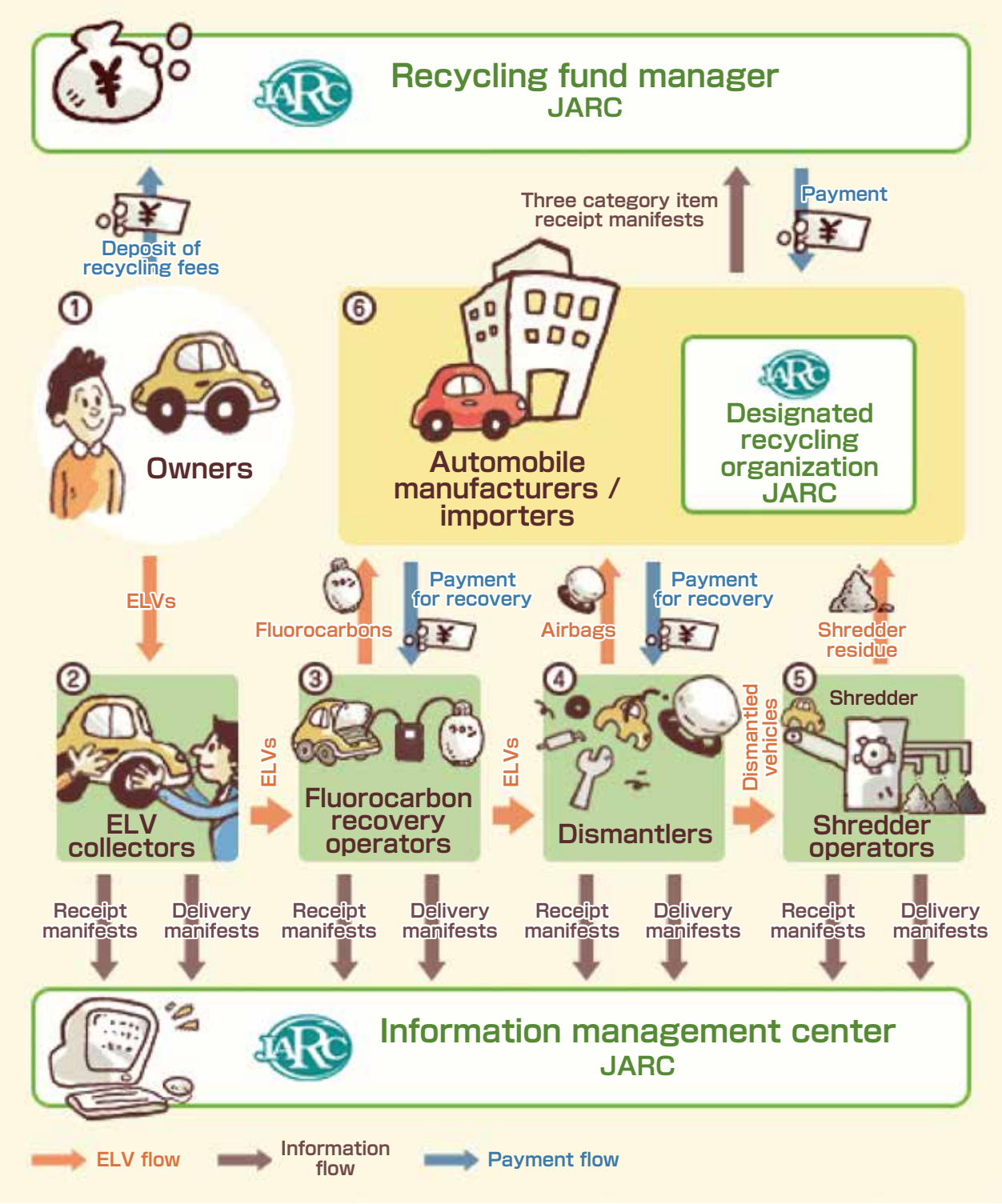
Source: METI and MOE (Tentative Translated by Eco-Mo Foundation)

●Fluorocarbon Discharge Prevention Act pamphlet



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

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



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

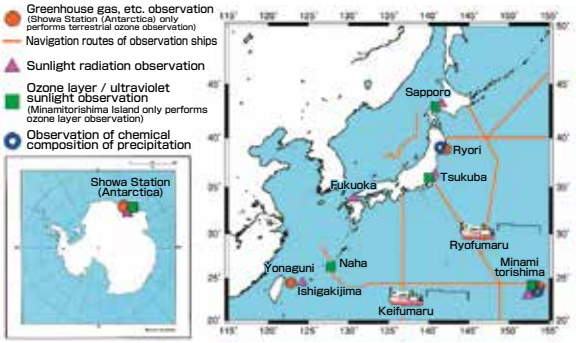
6 Global environmental observation and monitoring

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 JMA is implementing the following measures in accordance with the "Strategic Policy Regarding Future Global Environmental Operations", formulated and announced in 2008.

●Atmospheric environment monitoring network



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

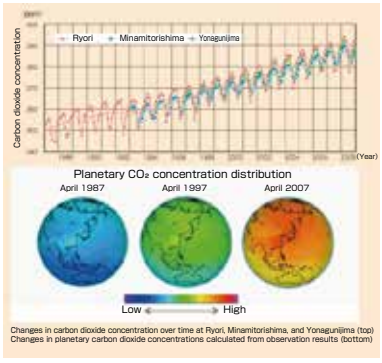
In order to assess greenhouse gas conditions, the amount of CO_2 in the atmosphere is being measured at three locations in Japan and the amount of CO_2 in the surface sea water and the air above the northwest Pacific Ocean is being measured by marine weather observation vessels. Furthermore, since 2009 precise sunlight and infrared radiation measurements have been performed at five locations in Japan.

Sea level increases levels caused by global warming are 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.

"Climate change monitoring reports" and "Anomalous weather reports" are created based on observation results, and views on annual climate changes, anomalous weather, and global warming conditions and changes are also released.

●Changes in carbon dioxide concentrations in Japan and global concentration distribution of carbon dioxide (3 measurement points)



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

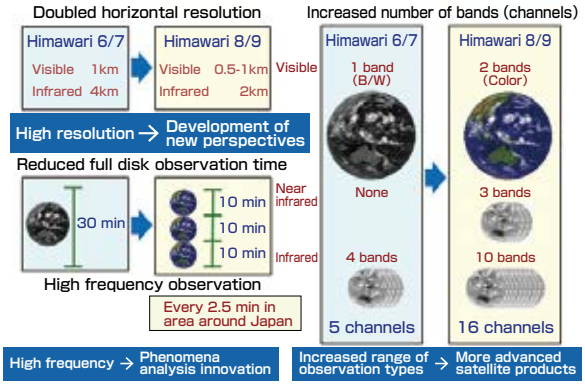
●Climate change monitoring report

Source: JMA

(2) Himawari 8 and 9

Himawari 8 and 9 are the successors to the Himawari 7 (MTSAT-2) satellite, a multipurpose transport satellite currently in operation. Himawari 8 was launched in October 7, 2014, and after performing confirmation testing of its functionality while it orbited, full-fledged operation began on July 7, 2015, taking over from Himawari 7. Himawari 9 was launched in 2016, and will remain in orbit in standby until 2022. Himawari 8 and 9 have radiometers (AHI) which use cutting edge observation technologies, and their deployment ahead of other US and European next generation still imaging satellites has drawn international attention.

●Monitoring capability improvements provided by Himawari 8/9



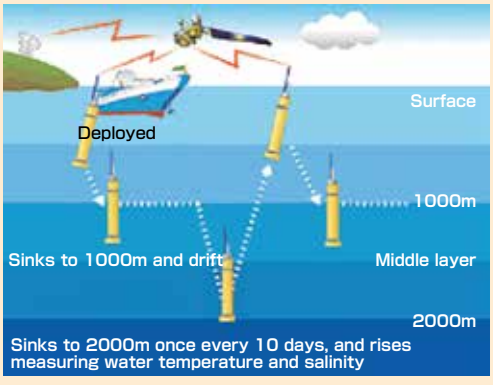
Source: JMA (Tentative Translated by Eco-Mo Foundation)

(3) Sea observation and monitoring

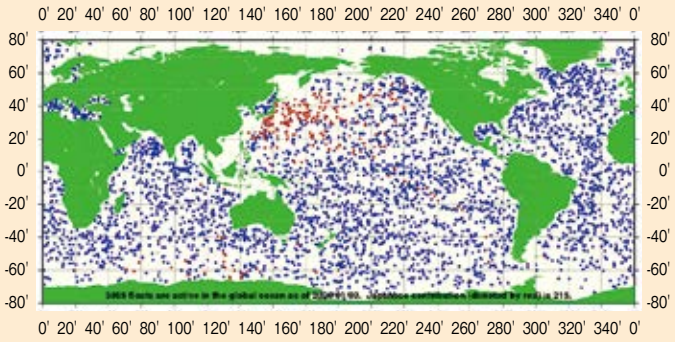
The sea absorbs CO_2, a greenhouse gas, and retains heat, moderating global warming. Sea changes are intrinsically linked to typhoons and anomalous weather conditions, so accurately assessing sea conditions is an important part of responding to global environmental problems.

In order to immediately monitor and assess sea 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 sea.

●Overview of Argo project monitoring and Argo float distribution



Argo floats deployed at sea by marine weather observation 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 (3,865 floats as of January 3,2020. 215 of these floats are Japanese, indicated with a (●).)

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

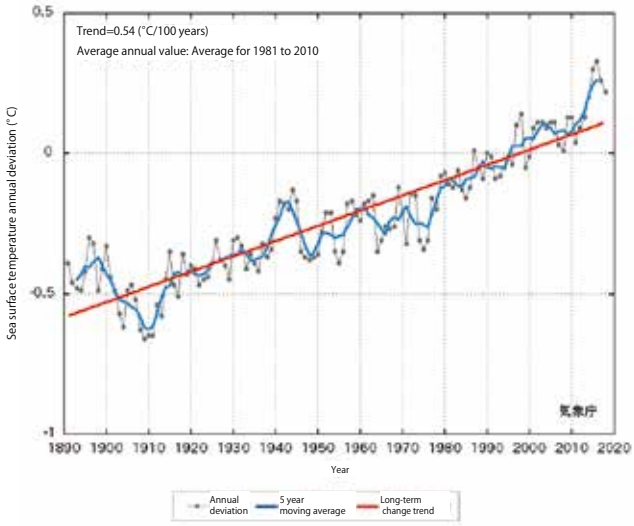
The JMA collects and analyzes data from various sources, such as observation vessels, Argo floats, and satellites, and releases "Marine Health Diagnosis Tables", comprehensive diagnoses and future predictions regarding sea change conditions related to the global environment.

The Japan Coast Guard's Japan Oceanographic Data Center collects and manages sea data from Japanese oceanic research organizations, and provides it to related organizations and the general public.

●"Marine Health Diagnosis Table"
Yearly average sea surface temperature (global average) annual deviation trend

Diagnosis (2018)

•In 2018, the sea surface temperature was 0.22° C higher than the average annual sea surface temperature (global average). This was fourth highest value since statistics were first recorded in 1891.
•The average annual sea surface temperature (global average) is changing due to marine and atmospheric changes, global warming, etc., on a scale of several years to several decades. The long-term trend has been an increase of 0.54° C per century.



Average annual sea surface temperature (global average) annual deviation trend
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 1981 to 2010.

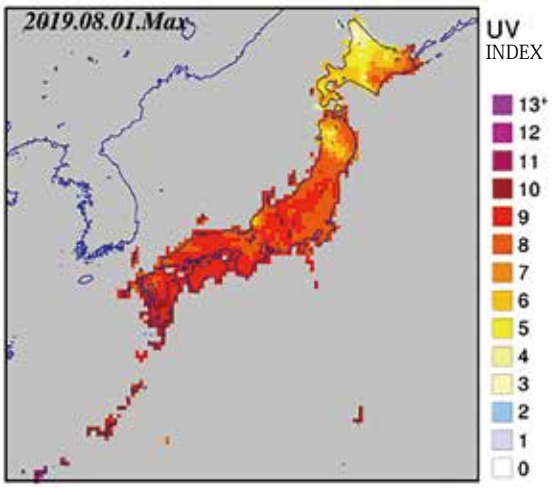
Source: JMA (Tentative Translated by Eco-Mo Foundation)

(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 fluorocarbons and other ozone layer destroying 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 daily data regarding ultraviolet radiation in the form of a UV index, easy-to-understand numerical data indicating the strength of ultraviolet radiation.

●UV index (max daily values)



Source: JMA

(5) Promotion of regular observation at the south pole

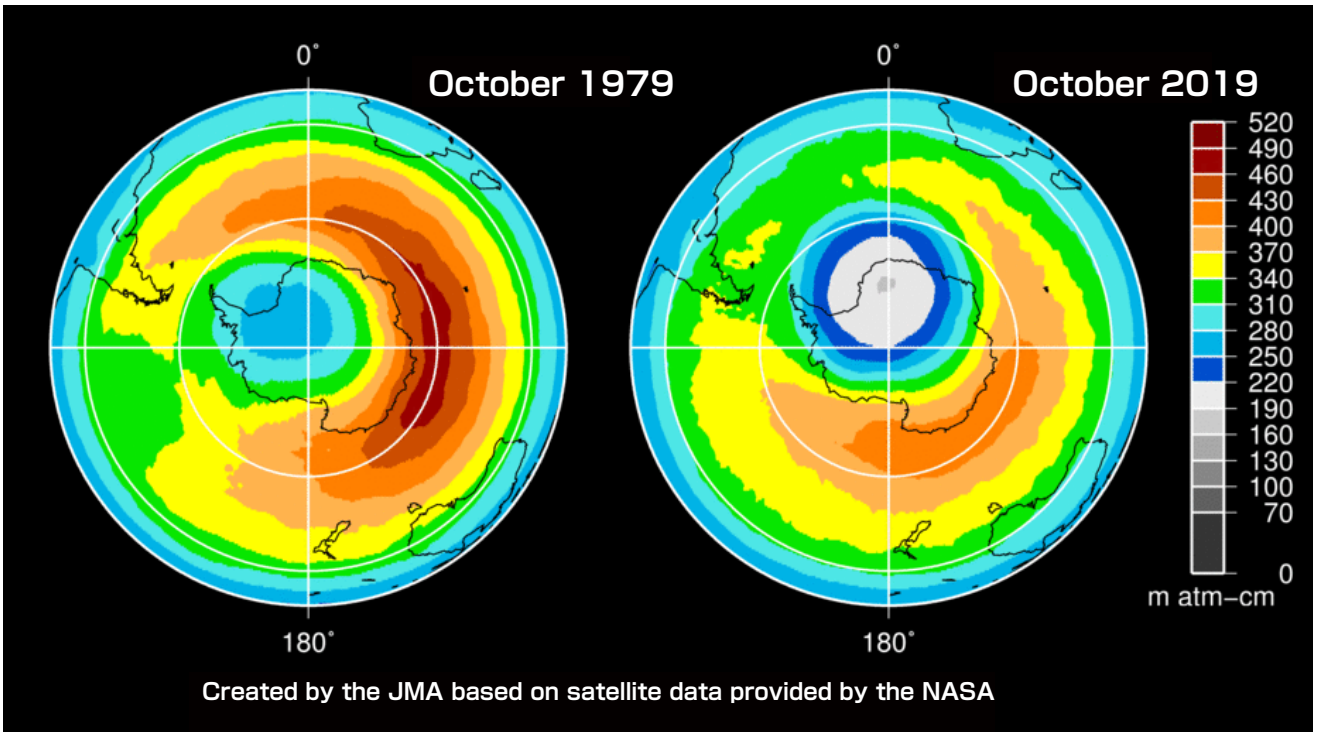
The Geospatial Information Authority creates topographical and other maps based on reference point measurements, gravity measurements, continuous GPS observation, bare rock area change measurements, and photographic measurements. The results contribute to research regarding global environmental changes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

At the Showa Base the JMA is performing continuous sunlight, radiation, and land and high altitude meteorological observation. This observation is effectively utilized in international measures, contributing to climate change research and monitoring of the south pole 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 Anarctic region (October) 1979 to 2019

Distribution of average ozone levels in October in the Anarctic region in 1979, before the southern hemisphere ozone hole appeared, and in 2019.
The region with a concentration of 220m atm-cm or less is the ozone hole.
Created by the JMA based on satellite data provided by the NASA
For details on the satellite data used, please refer to Attachment 1 "Observation Material used in Analysis" of "Yearly Summary of the Ozone Layer and Ultraviolet Rays".



Source: JMA and NASA (Tentative Translated 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.

The MLIT, which controls various sectors including territory preservation and is responsible for making territories and regions safe and secure, established the "MLIT Climate Change Adaptation Plan" in November 2015, and afterwards in November 2018 carried out a revision that takes into account the latest policies.

The transport and infrastructure sector is already experiencing subway flooding and pavement collapses caused by record rainfalls and typhoons, transport interruptions due to snowfall, and other problems. In the future heavy rains, strong typhoons, and violent weather phenomena such as tornados are expected to occur more frequently, and there are concerns of growing climate risks.

Given these situation, there is a strong need to smoothly secure infrasturactures and personnel.

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

Potential impact of climate change on transport and infrastructure

(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

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.

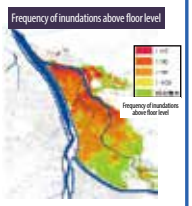
2) **Disaster mitigation measures for external forces which exceed facility capacities**
① Facility measures involving operation, structure, maintenance procedures, etc.
② Flood mitigation measures integrated with town planning and community development
③ Evacuation, first-aid activity, business continuity,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

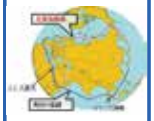

[Subway station flood prevention using water blocking boards]

○**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

Infrastructure 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 Translated 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)
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)
NPA (National Police Agency)
OECD (Organization for Economic Co-operation and Development)
PM (Particulate Matter)
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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