2016
Transport and Environment in Japan

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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 2016", published in March 2016 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.

Table of Contents

Ⅰ. Developments Related to Environmental Issues in 2015

There were a great deal of developments in 2015, both inside Japan and overseas, related to environmental issues. Belows are some of the developments in global warming, automobiles and the environment.

■Global warming related developments

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 targets.

From 2013 to 2020 is the second commitment period of the Kyoto Protocol, but Japan decided not to participate in the second commitment period, instead choosing to implement voluntary measures.

Due to the energy problems resulting from the Great East Japan Earthquake and nuclear power plant disaster (2011), the government revised Japan's 2020 emissions reductions target (25% reduction compared to 1990), submitted to the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat in 2010, from the ground up. At the 19th conference of parties to the UNFCCC (COP19), held in November 2013, Japan announced a tentative post-Kyoto Protocol reduction target of 3.8% compared to 2005 by 2020.

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.

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. The Japanese cabinet approved Japan's INDC (greenhouse gas reduction targets, etc. for 2020 and beyond) in July 2015, and submitted it to the UNFCCC secretariat. Under this INDC, Japan's emissions reduction target was defined as a 26.0% reduction in 2030 compared to 2013 (25.4% reduction compared to 2005) (approximately 104.2 million tons of CO2).

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 was adopted.

On December 22, 2015, a meeting of the Global Warming Prevention Headquarters was held. Based on the Paris Agreement, the meeting decided that its global warming countermeasure policy would be to "formulate a global warming countermeasure plan based on the Japan's INDC and Paris Agreement by the next spring (spring of 2016)." It was also decided that "Japan would actively contribute to the creation of detailed international rules aimed at the implementation of the Paris Agreement, and would undertake the preparations necessary for Japan's signing and entering of the agreement."

■Automobile and the environment related developments

According to the Japan Automobile Dealers Association and the Japan Mini Vehicle Association, Mini-vehicles accounted for six of the top ten models in the new vehicle sales, and the remaining four models were hybrid vehicles or passenger vehicles with hybrid options.

Environmentally conscious vehicles such as mini vehicles and hybrids accounted for the majority of the top-selling automobiles. From the perspective of improved automobile safety and harmonization of international standards, testing methods for the UN's Global Technical Regulations on Hydrogen and Fuel Cell Vehicles and Regulations on CNG/LNG Vehicles were introduced into domestic standards, the mandatory installation of vehicle stability control devices was expanded, standards were tightened for collision avoidance systems, and mandatory installation of these systems was also expanded.

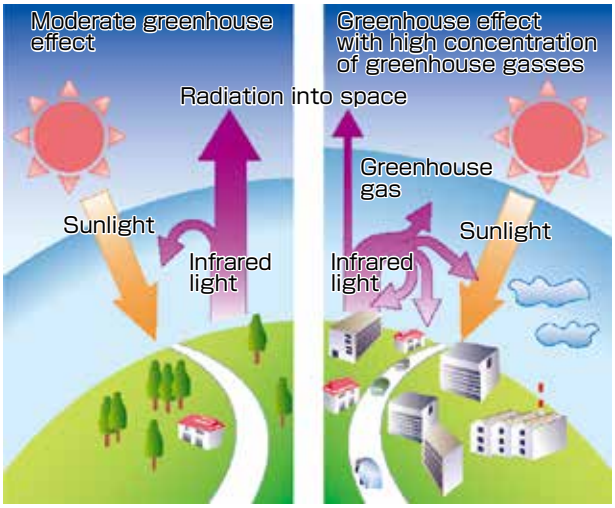
In order to accomplish this, the "Announcement that Prescribes Details of Safety Regulations for Road Vehicles (MLIT Announcement No.619 of 2002)" was revised, issued, and enacted.

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.

●Mechanism of the greenhouse effect



(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.

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 decade 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 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.

●Forecast of increase in average global surface temperature

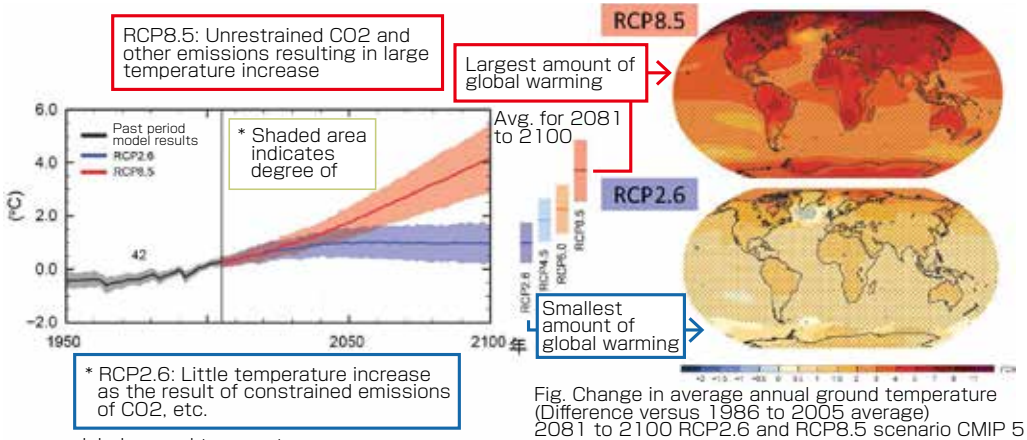


Fig. Change in average global ground temperature between 1986 and 2005
CMIP5 simulated timeline based on multiple models (1950 to 2100)
Source: Figure: IPCC AR5 WG I SPM Fig. SPM.7(a)

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
(IPCC AR5 WG I SPM Fig. SPM. P.20, lines 21 to 22)

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 2013 carbon dioxide accounted for 93% of all greenhouse gas contributions to global warming, an extremely high figure.

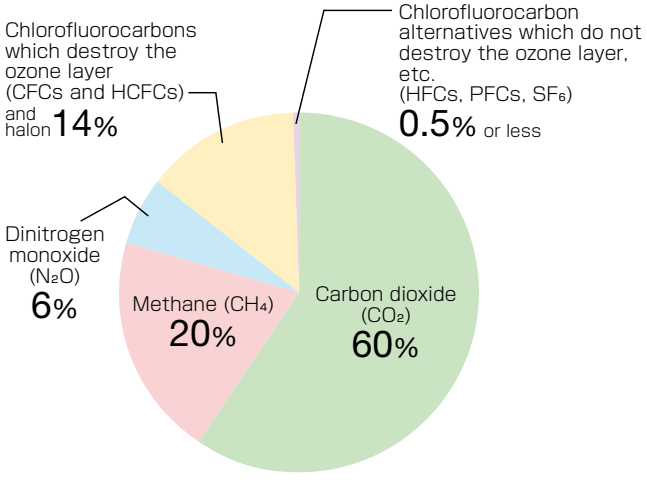
●Greenhouse gas and global warming potential (100 year period)(*1)

	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

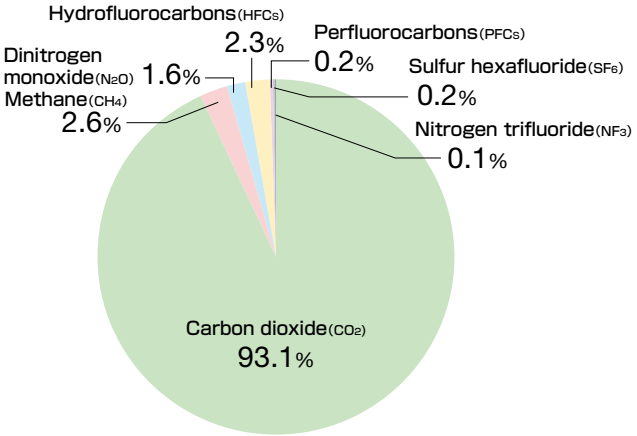
Source: IPCC (2007)

●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 2013)



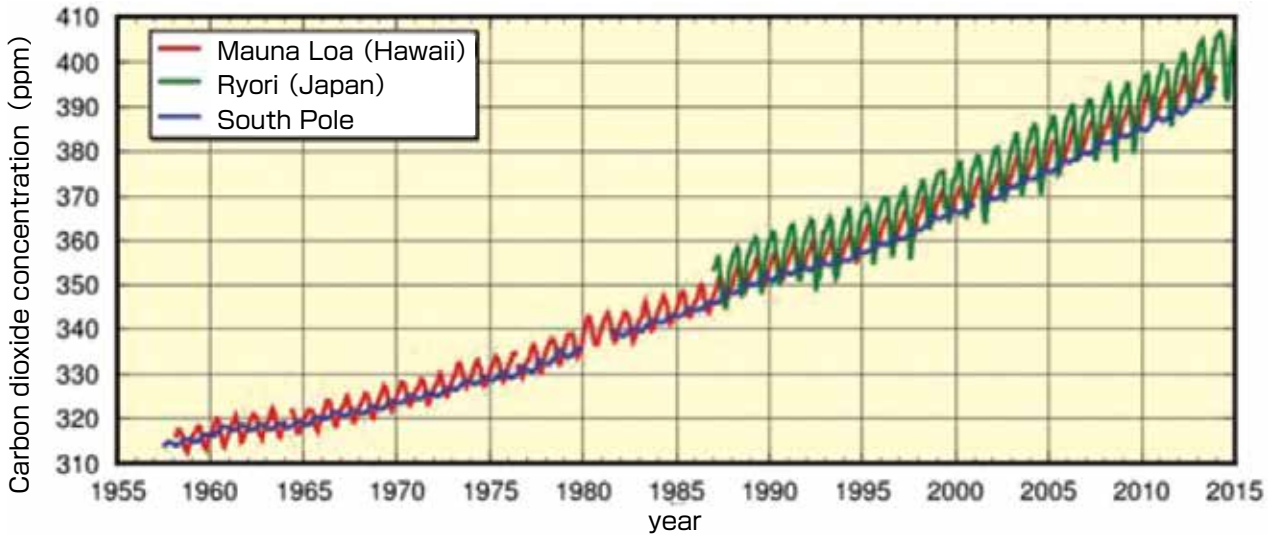
Source: GIO "Greenhouse Gas Inventory"

■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 2013 was 396.0ppm, significantly higher than the concentration before the industrial revolution.

●Change in carbon dioxide concentration at typical global observation points

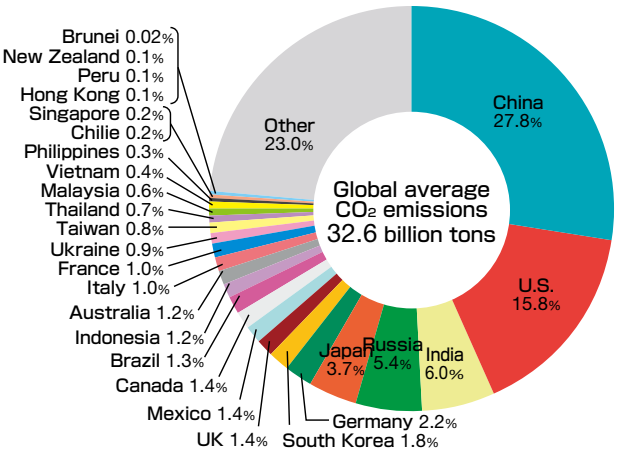


Source: Japan Meteorological Agency (JMA) "Climate Change Monitoring Report 2014" (Tentative Translated by Eco-Mo Foundation)

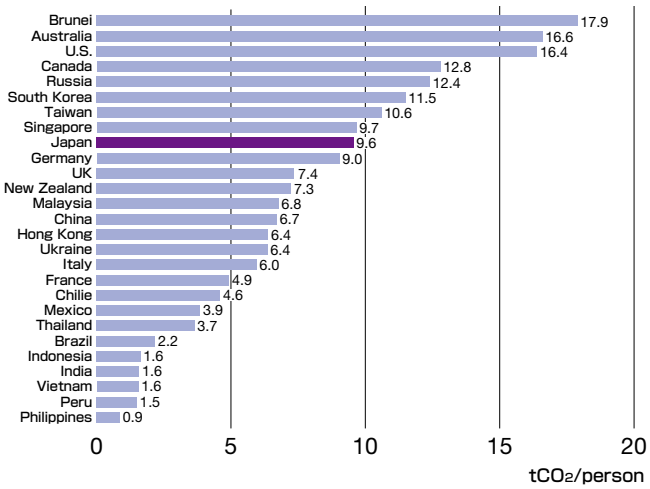
■Carbon dioxide emission volume by country

In 2012, Carbon dioxide emission volume by country is as follows: China 27.8%, America 15.8%, India 6.0%, Russia 5.4%, followed by Japan at 3.7%. In terms of per capita emissions by country, Japan is number 9.

●Share of carbon dioxide emission volume by country (2012)



●Per capita carbon dioxide emission volume by country (2012)



Source: EDMC "Handbook of Energy & Economic Statistics in Japan 2015"

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

■UNFCCC and the Kyoto Protocol

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 2016 the European Union (EU) and 195 countries, including Japan, are signatories.

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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The results of the December 2015 COP21 are shown below.

The 21st Session of the Conference of the Parties to the United Nations (UN) Framework Convention on Climate Change (COP21)
The 11th Session of the Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol (CMP11)

December 13, 2015

1. Overall Summary and Evaluation

(1) From November 30 to December 13, the 21st Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP 21) and the 11th Session of the Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol (CMP11) were held in Paris, France. From Japan, Ms. Tamayo Marukawa, Minister of the Environment, Mr. Seiji Kihara, State Minister for Foreign Affairs, Mr. Tsuyoshi Hoshino, Parliamentary Vice-Minister of Economy, Trade and Industry, Mr. Makoto Oniki, Parliamentary Vice-Minister of the Environment, and relevant parties from the Ministry of Foreign Affairs (MOFA), Ministry of Economy, Trade and Industry (METI), Ministry of the Environment (MOE), Ministry of Finance (MOF), Ministry of Education, Culture, Sports, Science and Technology (MEXT), Ministry of Agriculture, Forestry and Fisheries (MAFF), and Ministry of Land, Infrastructure, Transport and Tourism (MLIT) attended the conferences. On November 30, Prime Minister Abe of Japan and other officials attended the Leaders Event hosted by President Hollande of the French Republic.

(2) After holding working level negotiations at the Ad Hoc Working Group on the Durban Platform for Enhanced Action, negotiations were further conducted at the ministerial level from December 6. The final outcome was the adoption of a new legal framework, the Paris Agreement, on December 12. Japan highly values the adoption of the Paris Agreement, which is a fair and effective framework with participation from all countries.

2. Action taken by the Government of Japan

(1) In regard to the Paris Agreement, Japan, as represented by Environment Minister Marukawa and Foreign State Minister Kihara, actively participated in the negotiations and advocated that the new framework should be fair, effective and applicable to all countries, while also contributing to various discussions including by making specific proposals for the draft text of the Agreement.

(2) Representing Japan, Environment Minister Marukawa delivered a speech and once again emphasized we should make an effective, legal agreement applicable to all countries, while also stressing the need to set long-term goals and include within the legal agreement a cycle for the submission and review of targets and review mechanisms. Environment Minister Marukawa also stated that Japan will formulate a Global Warming Measures Plan as early as possible and steadily implement measures for reducing emissions, as well as implement specific adaptation measures based on the recently finalized National Adaptation Plan. Furthermore, Environment Minister Marukawa announced that Japan will provide approximately 1.3 trillion yen of public and private climate finance in 2020 to support developing countries, and enhance its development of innovative technologies. Through these statements, Japan helped create the momentum toward the consensus on the Paris Agreement.

(3) In addition, Environment Minister Marukawa and Foreign State Minister Kihara had a series of bilateral negotiations with a total of 14 countries and international organizations, including with ministers from France - the president of COP21, the United States, China, India, South Africa, and other major nations, as well as with UN Secretary-General Ban Ki-moon and other heads of international organizations. In these negotiations, both sides exchanged their views on the new framework and reaffirmed their commitment to closely work together to reach consensus. Furthermore, Environment Minister Marukawa spoke at a various official events such as an event focused on the cities and regions under the Lima-Paris Action Agenda (LPAA), where she promoted collaborative initiatives between Japan and Asian cities. METI Parliamentary Vice-Minister Hoshino also spoke at many official events such as an event on innovation under the LPAA, where he emphasized the importance of innovation and stressed that Japan can also lead discussions on resolving the issue of global warming with a focus beyond COP21. Environment Parliamentary Vice-Minister Oniki held talks with Mr. Rintaro Tamaki, the Organization for Economic Co-operation and Development (OECD) Deputy Secretary-General, and Dr. Naoko Ishii, CEO and Chairperson of the Global Environment Facility (GEF), among others. During these talks, both sides discussed the direction of the new framework, and exchanged opinions while also listening to the views of international institutions.

(4) The 3rd JCM Partner Countries' High-Level Meeting was held for all 16 signatory countries to the Joint Crediting Mechanism (JCM), during which all parties welcomed the progress of JCM and expressed their will to implement JCM through continuing mutual cooperation. Furthermore, Environment Minister Marukawa and Mr. Ramon J.P. Paje, Secretary of the Department of Environment and Natural Resources, the Philippines, signed an aide memoire for establishing JCM between Japan and the Philippines. In addition to this, 18 countries including Japan joined the "Paris Ministerial Declaration on Carbon Markets," which indicates the intent of Parties to cooperate in the use of international market mechanisms.

(5) Environment Minister Marukawa and Ms. Ségolène Royal, Minister of Ecology, Sustainable Development and Energy, France, signed a memorandum for strengthening friendly relations between both nations and on environmental cooperation for building a low-carbon society at the international and national levels.

(6) The Japanese Government opened the "Japan Pavilion" during the conferences, in which it introduced various initiatives of the government, institutions, organizations, and researchers in Japan and also held many talk events. Through "Japan Pavilion", the Japanese Government showcased Japan's contributions to tackling climate change.

(7) The 4th East Asia Low Carbon Growth Partnership Dialogue was held as an official side event for discussing the direction of low carbon growth in the East Asian region. At this event, a summary of proposals based on the achievements made up to the 3rd Dialogue was presented, and excellent examples of low carbon growth were introduced by Vietnam, Cambodia, Malaysia, and Japan.

3. Outcomes of the Conferences

(1) Adoption of the Paris Agreement

A COP decision was adopted containing the Paris Agreement in its Annex.

The Paris Agreement includes the following elements:

- Setting a long-term common global goal for holding the increase in the global average temperature to well below 2 ℃ above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5℃ above pre-industrial levels
- Communicating or updating emission reduction target every five years
- Reporting implementation of a target and undergoing a review in common but flexible manner.
- Use of market mechanisms, including JCM
- Taking action to conserve and enhance sinks and reservoirs of greenhouse gases, and taking action to implement and support the existing framework for: policy approaches and positive incentives for activities relating to reducing emissions from deforestation and forest degradation
- Setting the global goal on adaptation, and engaging in adaptation planning processes and the implementation of actions
- providing financial resources by developed country Parties to assist developing country, and providing support voluntarily by other Parties
- The importance of innovation
- taking stock of the implementation of this Agreement to assess the collective progress towards achieving the purpose of this Agreement and its long-term goals (global stocktake)every five years
- Entry into force on the thirtieth day after the date on which at least 55 Parties accounting in total for at least an estimated 55 percent of the total global greenhouse gas emissions have deposited their instruments of ratification, acceptance, approval or accession.
- the Sendai Framework for Disaster Risk Reduction (COP decision)

These elements also include many proposals from Japan.

(2) Other COP/CMP decisions

The following COP/CMP decisions were also adopted: Matters relating to finance,, Report of the Green Climate Fund to the Conference of the Parties and guidance to the Green Climate Fund, The 2013-2015 review, Report of the Adaptation Committee , Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts , Linkages between the Technology Mechanism and the Financial Mechanism of the Convention., and rules on implementation of the second commitment period of the Kyoto Protocol, etc.

(3) Schedule for next COP/CMP

COP22 will be held in November 2016 at Marrakesh in Morocco.

Source: Ministry of Foreign Affairs of Japan website

(3) Current status of global warming issues in Japan

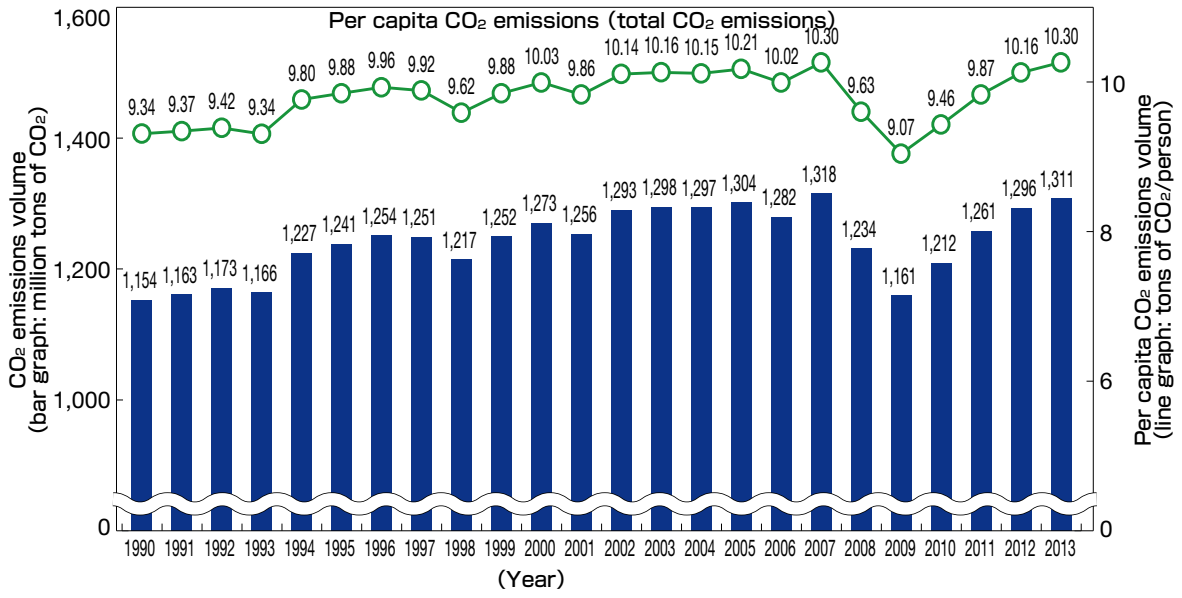
①Current status of carbon dioxide emissions in Japan

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 2013 Japan emitted approximately 1,311 million tons of carbon dioxide, roughly 13.5% more than it did in 1990. The per capita emissions volume in 2013 was approximately 10.30 tons.

●Trends in carbon dioxide emissions in Japan

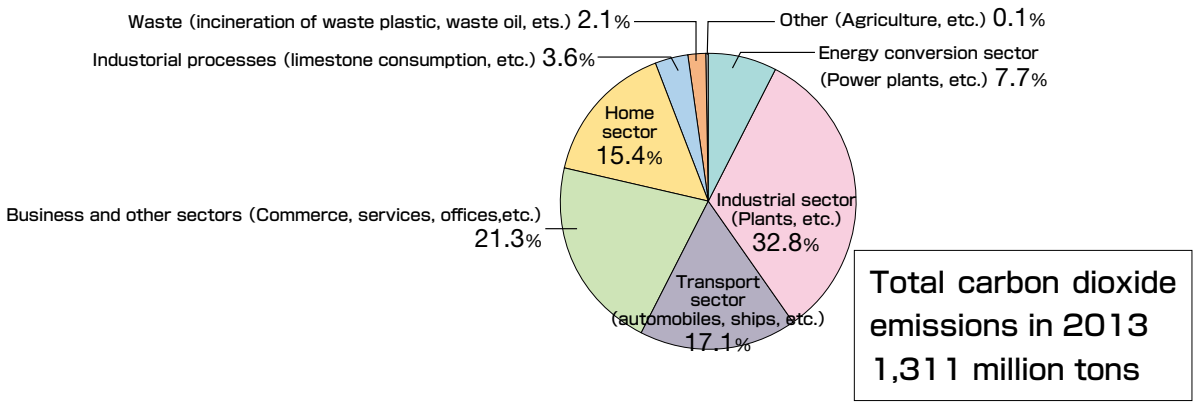


Source: GIO "Greenhouse Gas Inventory"

■Ratio of carbon dioxide emissions in Japan by sector

The industrial sector accounts for 32.8% of Japan's carbon dioxide emissions, the transport sector for 17.1%, business and other sectors account for 21.3%, and the home sector accounts for 15.4%.

●Amount of carbon dioxide emissions in Japan (by sector) 2013



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 peak has been falling since peaking in 2004.In 2010 the economic recovery, together with temperature conditions, produced a major increase in final energy consumption. In 2011 the focus on energy conservation following the Great East Japan Earthquake brought about another decline in final energy consumption. Real GDP reached a new record high in 2013, and final energy consumption fell by1.0% verus2012.

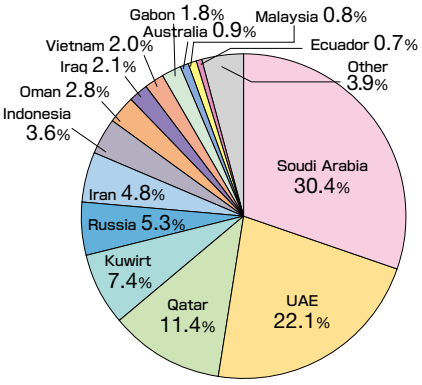
Looking at energy consumption trends from 1973 to 2013 energy, consumption for the company and business sector grew 1.1-fold (fell by 10% for industrial sector and grow 2.5-fold for business and other sectors), and 2.0-fold for the home sector ,1.8-fold for transport sector. Since the oil crises, the company and business sector, while experiencing economic growth led primarily by manufacturing, has seen minimal increase in energy consumption thanks to the implementation of energy saving measures. On the other hand, the home sector and transport sector has seen greatly increase in energy consumption because of the spread of energy equipment and automobile. As a result, while the industrial, consumer, and transport sectors accounted, respectively, for 74.7%, 8.9%, and 16.4% of total energy consumption in 1973, in 2013 these ratios had changed to 62.5%, 14.4%, and 23.1% 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 falling crude oil prices. From the mid-1990s onwards the development of alternative energy sources, etc. caused petroleum use to decline.

In 2013 Japan supplied 0.3% of the crude self-sufficiency raito. Japan's major oil fields are located in Niigata Prefecture, Akita Prefecture, and Hokkaido. Because of this low level of self-sufficiency, in 2013 Japan relied on foreign imports for 99.7% of its crude oil, with over 80% coming from the Middle East. Japan is far more dependent on the Middle East for its oil than other countries — in 2013 the U.S. depended on the Middle East for 25.7% of its crude oil, and European OECD countries depended on the Middle East for 15.5% of their crude oil. In 2013 Saudi Arabia was Japan's largest supplier of crude oil, supplying 30.7%, followed by the UAE (22.7%), Qatar (13.0%), and Kuwait (7.2%).

●Crude oil imports by supplying country (2012)



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

(Source: METI "Energy White Paper 2015" (Tentative Translated by Eco-Mo Foundation)

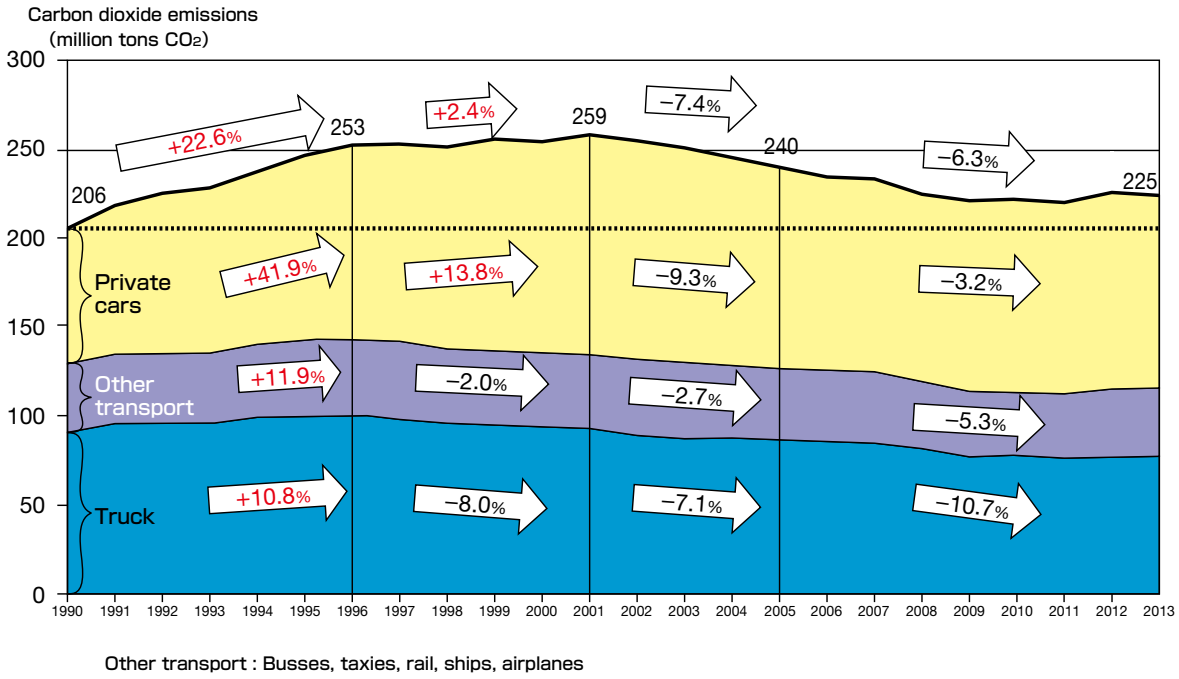
(4) Current status of global warming issues in the transport sector

①Current status of carbon dioxide emissions by the transport sector

■Trends in carbon dioxide emissions by the transport sector

From 1990 to 1996 the amount of carbon dioxide emitted by the transport sector rose by 22.6%, but the rise in emissions then slowed, and began falling from 2001 onwards. In 2013 the amount of carbon dioxide emissions was approximately 225 million tons, 9.2% more than in 1990.

●Trends in carbon dioxide emissions by the transport sector



Other transport : Busses, taxies, rail, ships, airplanes

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

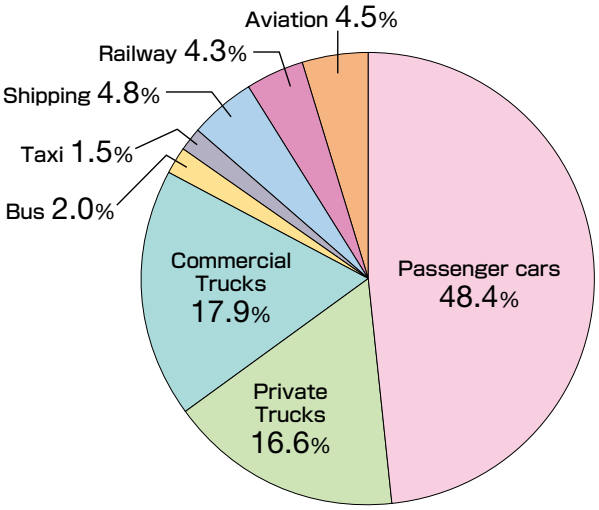
Carbon dioxide emissions from automobiles accounts for 86.4% of total carbon dioxide emissions produced by the transport sector. 48.4% of these carbon dioxide emissions are produced by private cars.

■Carbon dioxide emission rates by the transport sector

Comparing passenger transport carbon dioxide emission rates (the amount of carbon dioxide emitted in transporting a person for 1km), private cars emit 6.7 times more carbon dioxide than rail transport. Therefore in order to reduce carbon dioxide emissions, the use of public transportation, which has smaller carbon dioxide emission rates than private vehicles, need to be promoted.

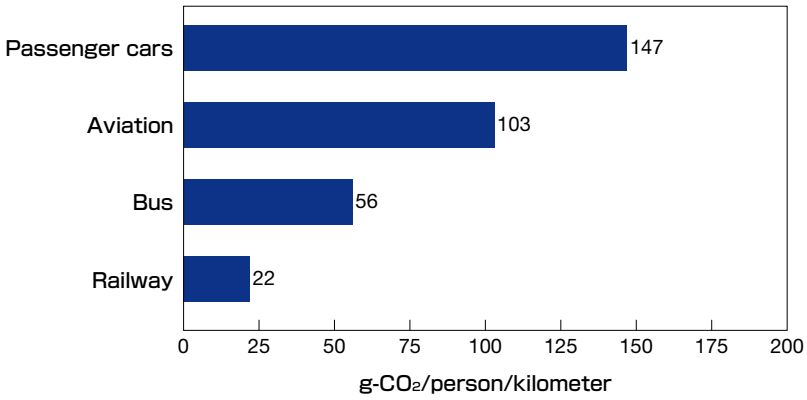
For freight transport carbon dioxide emission rates (the amount of carbon dioxide emitted in transporting one ton of freight for 1km), private truck emit 48 times more carbon dioxide than trains, 31 times more than ships, and 6 times more than commercial truck. There need to be a modal shift, moving to efficient use of commercial truck, ships, and trains, improving distribution efficiency.

●Amount of carbon dioxide emissions from the transport sector (by means of transportation) 2013

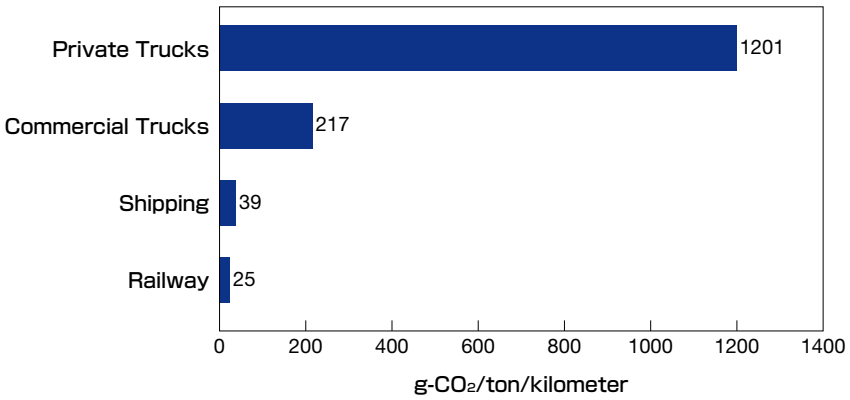


Source: MLIT website (Tentative Translated by Eco-Mo Foundation)

●Carbon dioxide emission rates by passenger transport mode (2013)

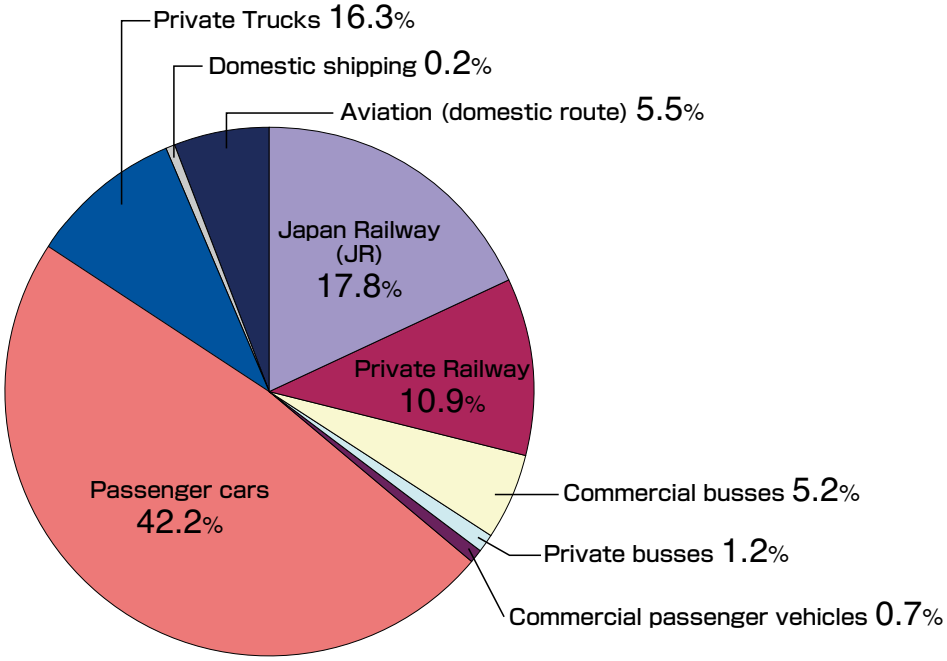


●Carbon dioxide emission rates by freight transport mode (2013)

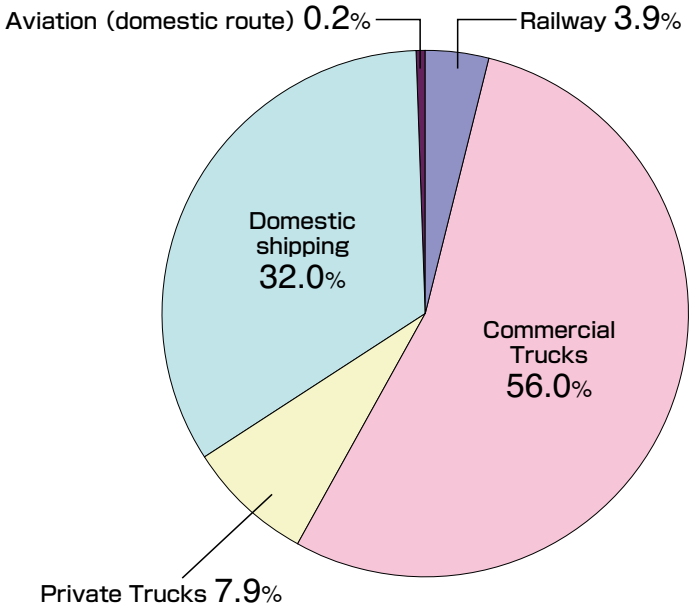


Source: MLIT website (Tentative Translated by Eco-Mo Foundation)

●Modal shares of domestic passenger transport (per person per kilometer), 2009



●Modal shares of domestic freight transport (per ton per kilometer), 2009



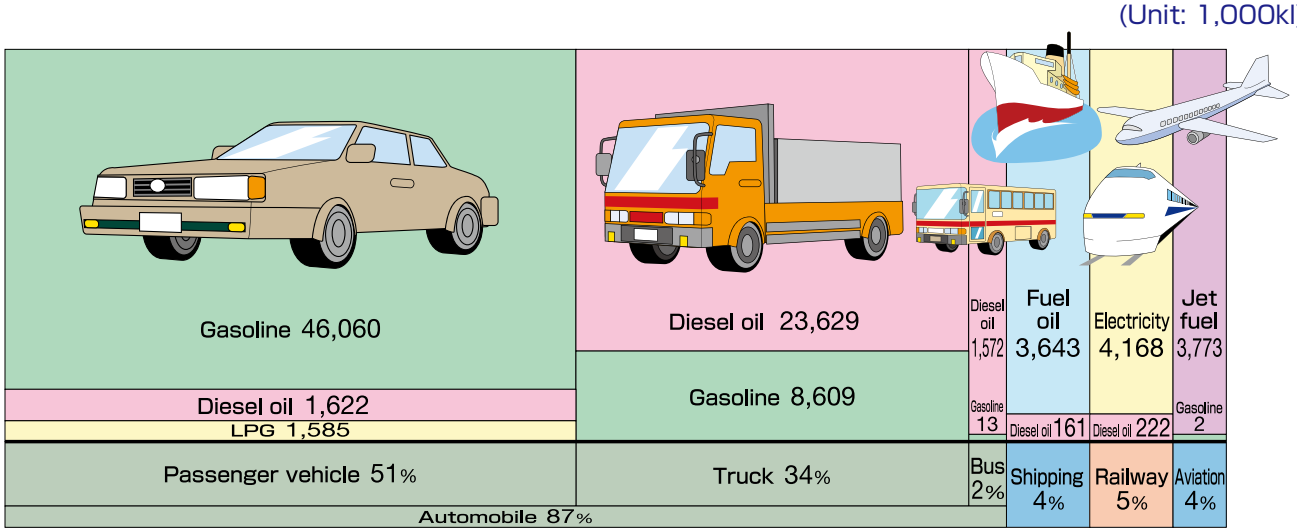
Source: MLIT "White Paper on Land, Infrastructure, Transport and Tourism in Japan 2011" (Tentative Translated by Eco-Mo Foundation)

②Energy consumption by the transport sector

Within the transport sector, automobiles account for the largest amount of energy consumption, roughly 87% of the sector's total energy consumption. The majority of this is energy consumption is by cars and trucks. In terms of consumption by oil type, gasoline and diesel oil account for 87% of the transport sector total.

●Ratios of energy consumption type and volume of oil used by means of transport (2009)

(Unit: 1,000kl)



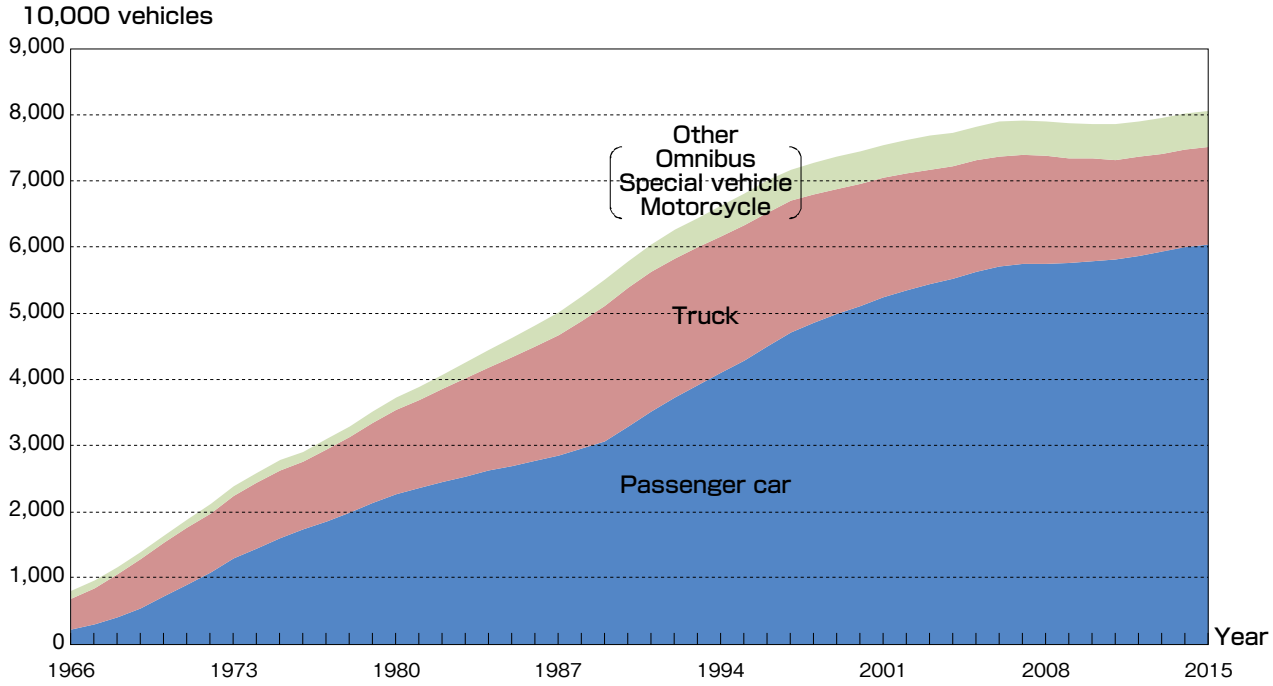
Total: 95,059,000kl crude oil equivalent
Note: Does not include oversea ocean shipping or international aviation

Source: MLIT "Transportation Statistics Collection" (Tentative Translated by Eco-Mo Foundation)

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 2013 were 225 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.

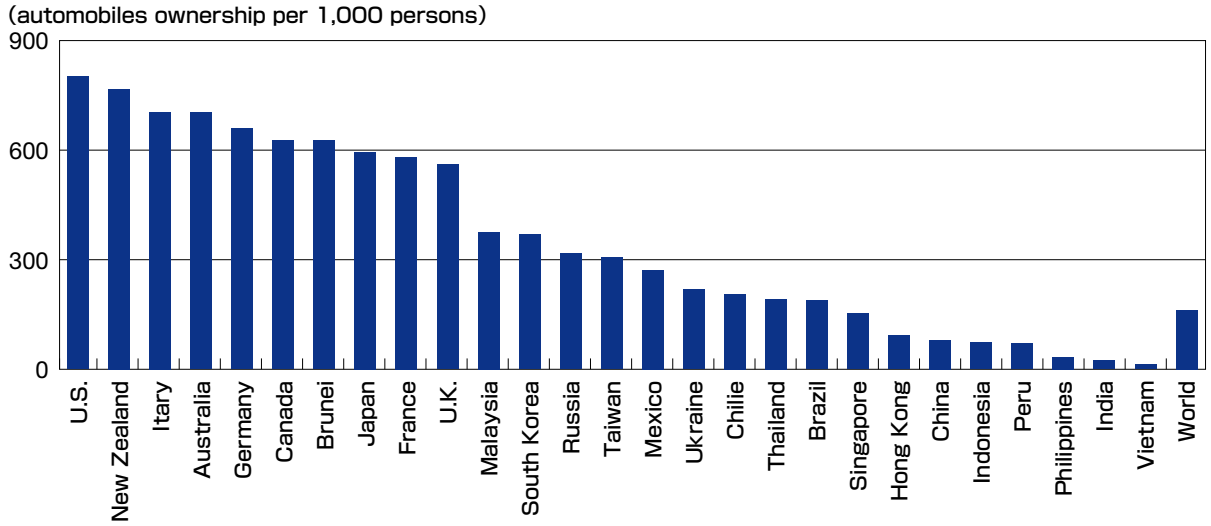
Source: Automobile Inspection & Registration Information Association website (Tentative Translated by Eco-Mo Foundation)

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 801 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 2.5% globally in 2012, but in China it grew by 16.2%, and in India by 8.2%. 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 2012



Source: EDMC "Handbook of Energy & Economic Statistics in Japan 2015"

2 Current status of automobile gas emissions

Road transportation related environmental problems involving the transport sector include atmospheric pollution produced by suspended particulate matter (SPM) and nitrogen oxides (NOx) such as nitrogen dioxide (NO2) 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 have met 2013 air quality standards achievement rates for NO2, with 100% achievement rates for eight consecutive years since 2006. Automobile exhaust gas monitoring stations have seen a slight decline in target achievement, at 99.0% compared to 2012. For automobile exhaust gas monitoring stations in areas implementing Automobile NOx/PM Act measures the achievement rate was 98.6%. For SPMs, nationwide air quality standards achievement rates were 97.3% for air pollution monitoring stations and 94.7% for automobile exhaust gas monitoring stations. These have fallen slightly, for both types of stations, in comparison to 2012 (air pollution monitoring station: 99.7%, automobile exhaust gas monitoring station: 99.7%).

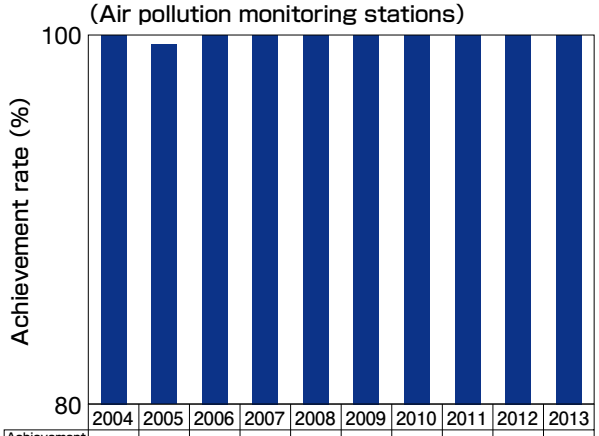
SPM 2013 air quality standards achievement rates for areas implementing Automobile NOx/PM Act measures were 96.4% for both air pollution monitoring stations and 92.3% for automobile exhaust gas monitoring stations, have fallen slightly.

※1 Air pollution monitoring station:
Monitoring stations performing regular monitoring of general atmospheric pollution conditions. (Nationwide: 1,478 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: 417 stations)

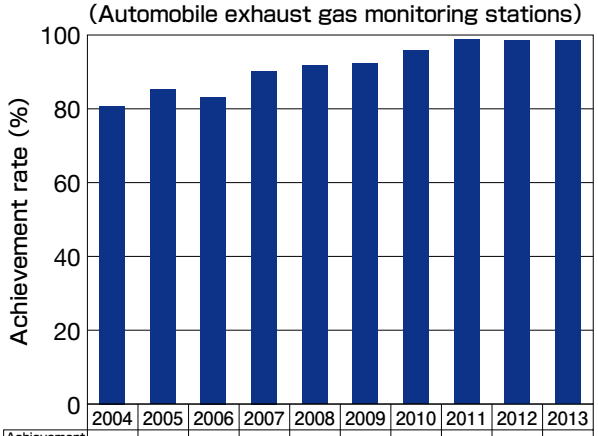
●NO2 air quality standards achievement rates in regions implementing Automobile NOx/PM Act measures (2004 to 2013)

(Air pollution monitoring stations)



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Achievement rate	100%	99.8%	100%	100%	100%	100%	100%	100%	100%	100%
No. of effective stations	447	448	441	436	436	438	411	425	418	411
No. of achieving stations	447	447	441	436	436	438	411	425	418	411

(Automobile exhaust gas monitoring stations)

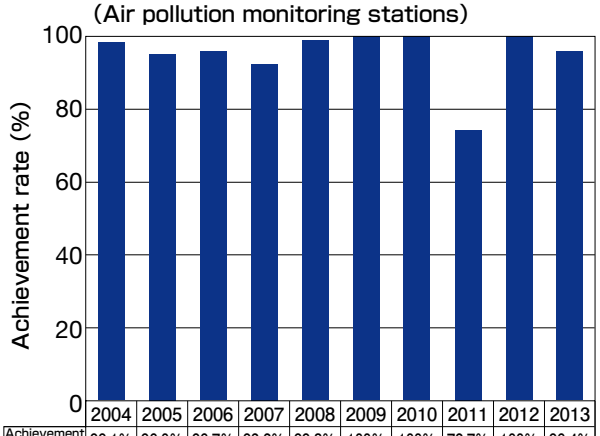


	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Achievement rate	81.1%	85.1%	83.7%	90.6%	92.0%	92.9%	95.7%	99.1%	98.6%	98.6%
No. of effective stations	217	222	227	224	225	226	207	219	216	218
No. of achieving stations	176	189	190	203	207	210	198	217	213	215

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

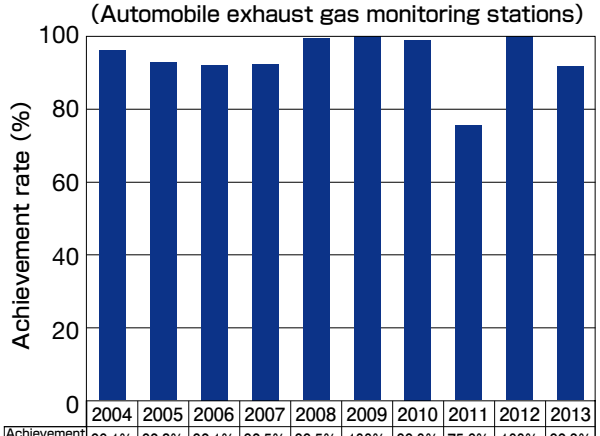
●SPM air quality standards achievement rates in regions implementing Automobile NOx/PM Act measures (2004 to 2013)

(Air pollution monitoring stations)



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Achievement rate	99.1%	96.0%	96.7%	93.2%	99.8%	100%	100%	72.7%	100%	96.4%
No. of effective stations	452	452	448	443	440	439	415	429	421	415
No. of achieving stations	448	434	433	413	439	439	415	312	421	400

(Automobile exhaust gas monitoring stations)



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Achievement rate	96.1%	92.8%	92.1%	92.5%	99.5%	100%	99.0%	75.6%	100%	92.3%
No. of effective stations	206	209	215	212	213	214	197	209	207	209
No. of achieving stations	198	194	198	196	212	214	195	158	207	193

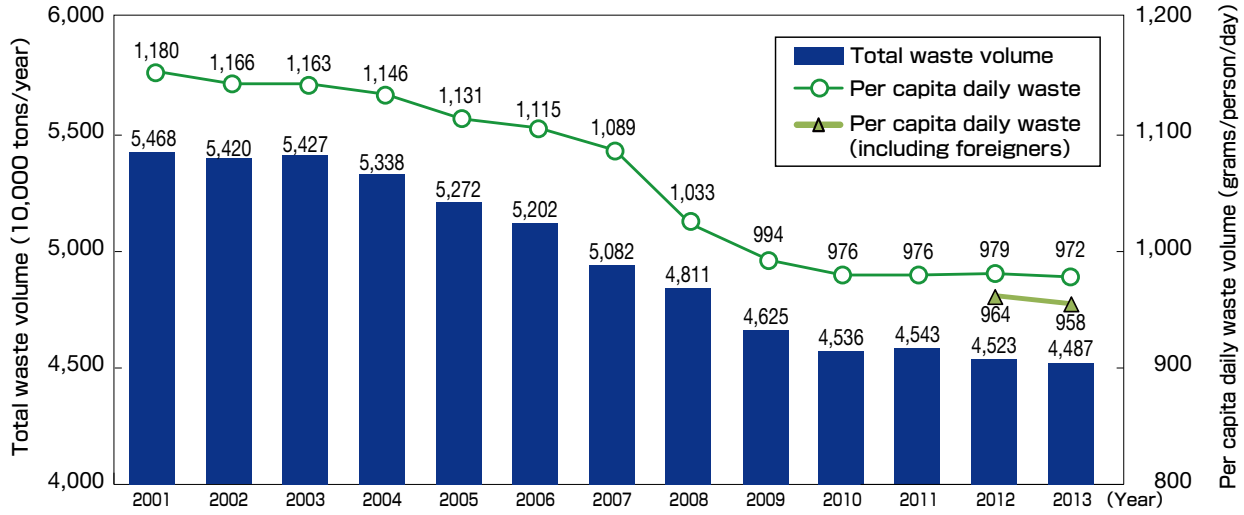
Source: MOE website (Tentative Translated by Eco-Mo Foundation)

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 2013 the total amount of waste was 44.87 million tons. The total amount of recycled waste in 2013 was 9.27 million tons. The ratio of total waste which was recycled has grown tremendously, from 5.3% in 1990 to 20.6% in 2013 (an increase of 0.1% over the previous year).

●Total waste volume and per capita daily waste volume

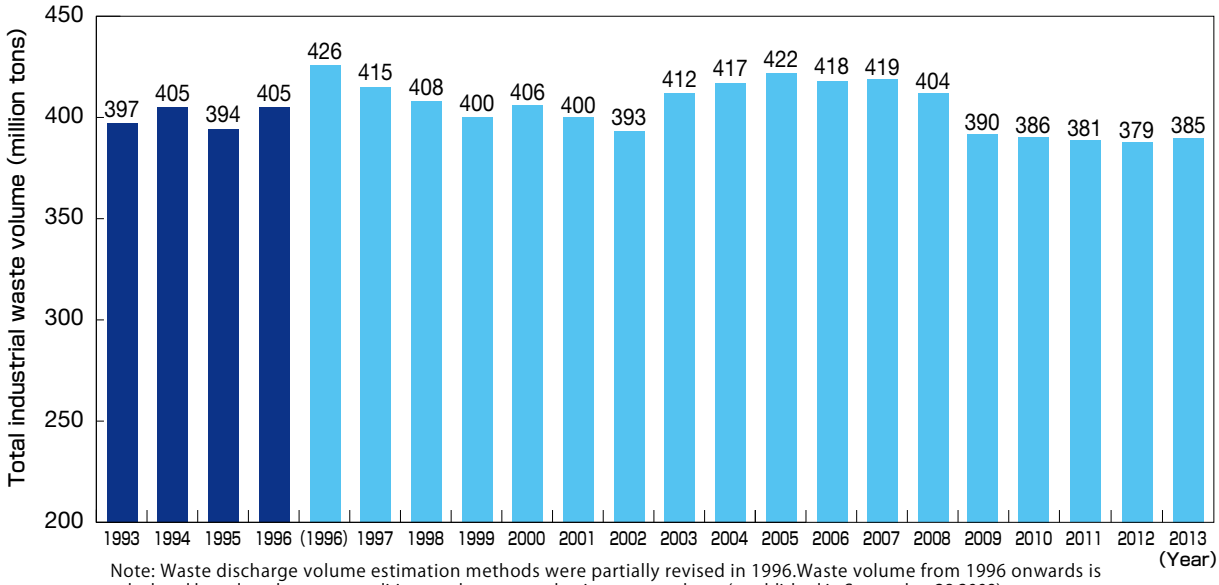


Source: MOE website (Tentative Translated by Eco-Mo Foundation)

②Trends in industrial waste volume

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

●Industrial waste volume



Note: Waste discharge volume estimation methods were partially revised in 1996.Waste volume from 1996 onwards is calculated based on the same conditions as the waste reduction target volume (established in September 28 2009) .
*:Government set value based on The dioxin countermeasures basic policy (Ministerial Conference on Dioxin Policy decision).

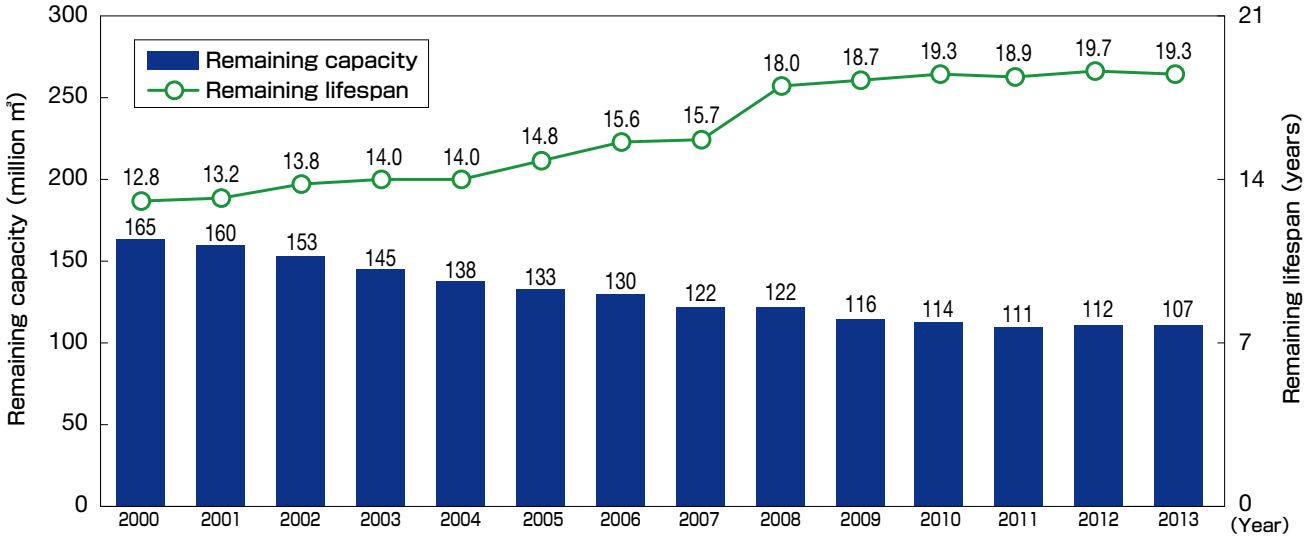
Source: MOE website (Tentative Translated by Eco-Mo Foundation)

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

As of the end of 2013 there were 1,723 general waste final disposal sites in Japan with a remaining capacity of 107.41 million m³. The average remaining lifespan was 19.3 years. The remaining capacity is shrinking, and the remaining lifespan is decreasing.

The remaining capacity of industrial waste final disposal sites as of the end of 2012 was 182.71 million m³, 3.44 million m³ less than the previous year. The average nationwide remaining lifespan is 13.9 years. Slight improvements are being made, but the remaining lifespan in the Tokyo area is 6.3 years, and remaining capacities are particularly low for major metropolitan areas.

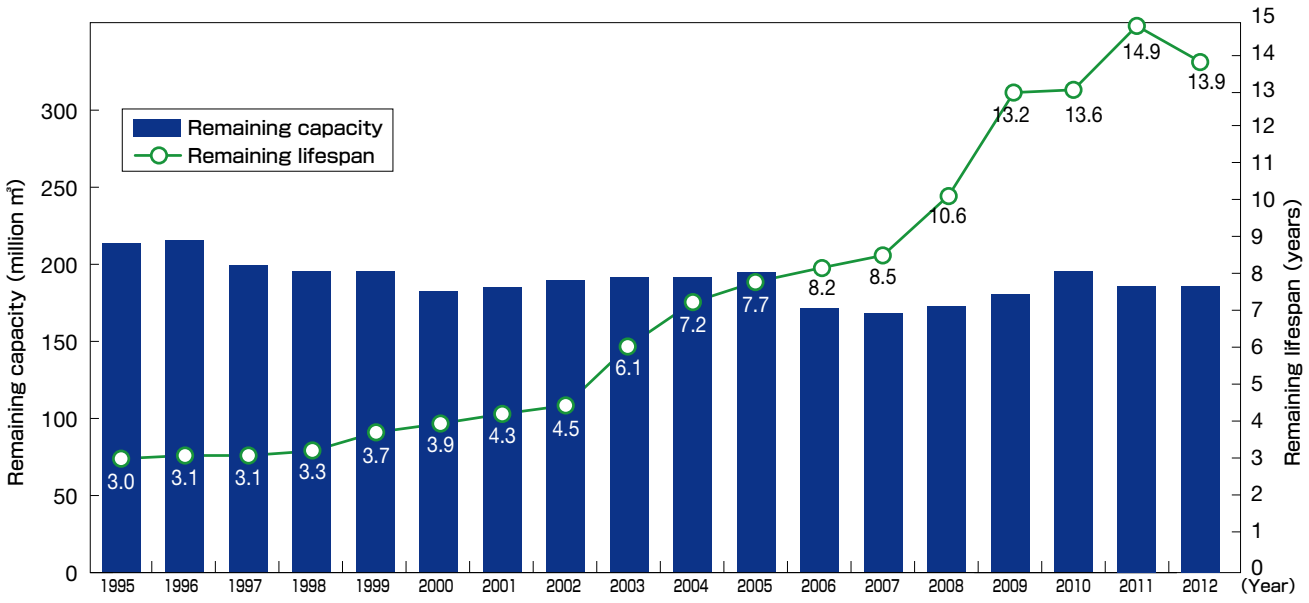
●Remaining lifespans and remaining capacities of final disposal sites (general waste)



Note: Of the remaining capacity revised through aerial measurements, etc., in 2005, the increase (7,737,000m³) have been added to the data for 2004 and earlier, and the remaining capacities and remaining lifespans for each year have been recalculated. Because of this, the figures differ from those announced in 2004.

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

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

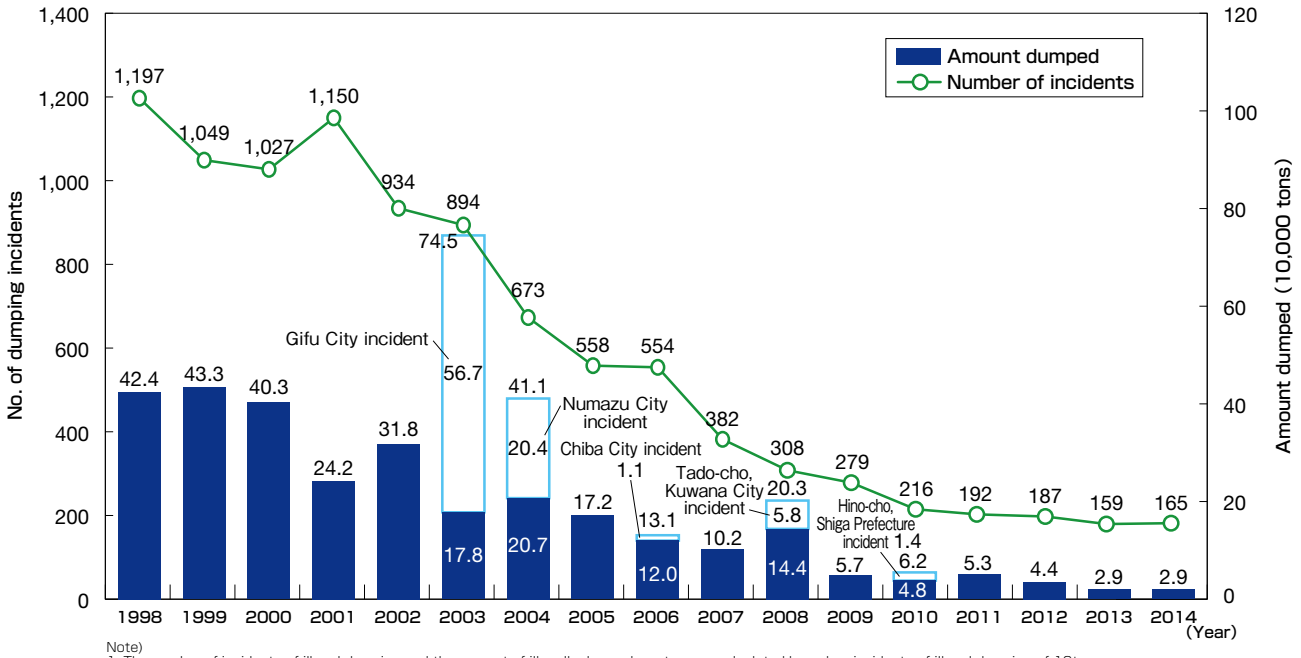


Source: MOE website (Tentative Translated by Eco-Mo Foundation)

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

165 incidents of illegal dumping of industrial waste, a total of 29,000 tons of waste, were discovered in 2014, along with 146 incidents of improper disposal (60,000 tons). The number of incidents, and volume of waste involved, has decreased yearly in conjunction with enhanced enforcement of the Waste Management and Public Cleansing Act.

●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.
3. The sulfate aid 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 (as of March 27, 2015).

* Amounts are rounded, so totals may not match.

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

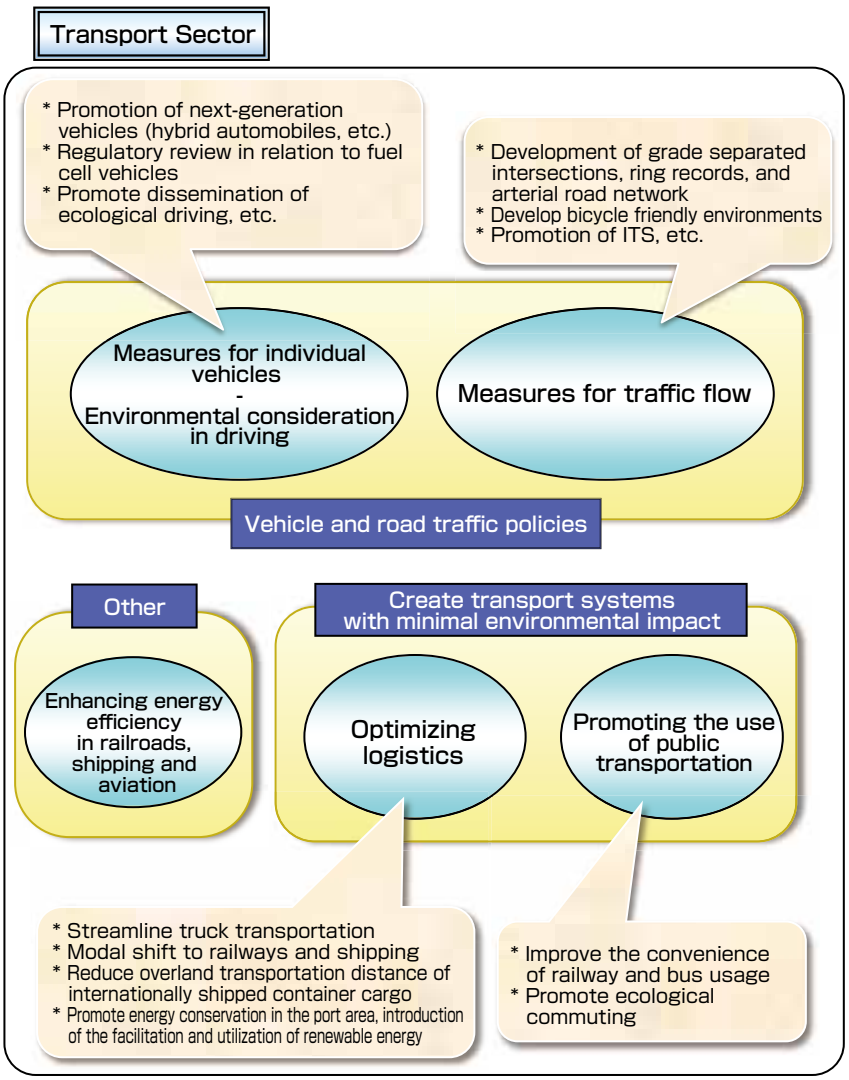
Ⅲ. Measures in Response to Major Environmental Problems of the Transport Sector

1 Promotion of global warming countermeasures

(1) Transport sector countermeasures

The amount of carbon dioxide emitted by the transport sector in 2013 was 9.2% greater than the amount emitted in 1990, 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, distribution efficiency improvements, and promoting the use of public transportation.

●Global warming countermeasures of MLIT



Source: MLIT "White Paper on Land, Infrastructure, Transport and Tourism in Japan 2014" (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 CO2 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 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 and small cargo vehicles, 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 vehicles. These new standards aimed for a 23.5% improvement in fuel efficiency (versus 2004) for passenger vehicles by 2015.

In March 2013 new fuel efficiency standards were created for passenger vehicles, 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 cargo vehicles, 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).

○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.

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.

●Passenger vehicles

[Gasoline passenger vehicles, diesel passenger vehicles, and LP gas passenger vehicles (with occupancies of 10 people 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

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

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

●Cargo vehicles

[Gasoline cargo vehicles and diesel cargo vehicles (total vehicle weight of 3.5t or less)] Target year: 2022 Measurement method: JC08 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. (cargo 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

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

■Measures for developing and promoting energy-saving vehicles and low-emission vehicles

The increasingly severe global warming situation, together with the rise of CO2 emissions, air pollution, and crude oil prices resulting from the rapid increase in energy consumption by developing countries, has led to greater usage of energy-saving and low-emission vehicles such as compressed natural gas (CNG) vehicles, hybrid vehicles, and electric vehicles. Vehicles with functions such as automatically stopping idling engines when stopped, or which promote eco-friendly driving awareness by indicating with signal lamps when drivers are performing high fuel efficiency driving, are also becoming more popular.

Research is also taking place for new energy-saving vehicles, aimed at the commercialization of hybrid busses with inductive charging capabilities. These vehicles can be rapidly charged using electrical induction from electricity supply embedded in the pavement, without the need for electrical charging cords. The government, academia, and manufacturers are working together on verification testing for electrical full flat-floored busses, with testing being performed in Fujisawa City, Kanagawa Prefecture in August 2011.

From the perspective of improved automobile safety and harmonization of international standards, testing methods for the UN's Global Technical Regulations on Hydrogen and Fuel Cell Vehicles and Regulations on CNG/LNG Vehicles were introduced into domestic standards, the mandatory installation of vehicle stability control devices was expanded, standards were tightened for collision avoidance systems, and mandatory installation of these systems was also expanded.

In order to accomplish this, the "Announcement that Prescribes Details of Safety Regulations for Road Vehicles (MLIT Announcement No.619 of 2002)" was revised, issued, and enacted.

The "Global Technical Regulations on Hydrogen and Fuel Cell Vehicles" were established in June 2013 based on a proposal made by Japan. They have great potential for contributing to the adoption of fuel cell vehicles outlined in the "Regulatory Reform Implementation Plan" (approved by the Cabinet in June 2013).

- ○ They add requirements concerning the concentration of hydrogen leaked into the vehicle interior following fuel cell vehicle related collision testing, as well as requirements concerning the securing of gas containers to the vehicle, bringing the regulations into agreement with the Global Technical Regulations.
- ○ They change the method used for testing the strength of the mount of gas containers to compressed natural gas vehicles from vibration testing to acceleration testing, bringing them into agreement with the Regulations on CNG/LNG Vehicles.
- ○ They expand requirements for vehicle stability control device and collision avoidance braking system related vehicle stability control devices, making them mandatory for all busses, trucks, and trailers. They also strengthen collision avoidance braking system control related performance requirements, and make them mandatory for all busses and medium- and large-sized trucks.

●Inductive charging hybrid bus

●Large electrical full flat-floored bus

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 2012.

●10 Tips for Eco-driving

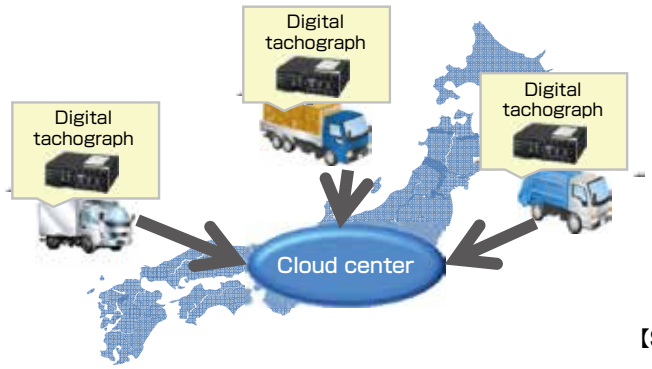
Source: The Eco-Drive Promotion Liaison Commitee

Column

Ecological and safe driving support services which use truck drive data

The promotion of "eco-driving" by truck operators is an important environmental conservation measure for the transport sector. Advances in ecological and safe driving support services which use truck drive data, combined with the effects of deploying digital tachographs, have produced services which improve fuel efficiency by approximately 15%. In addition to their environmental benefits, they also encourage safer driving, contributing to reduce traffic accidents.

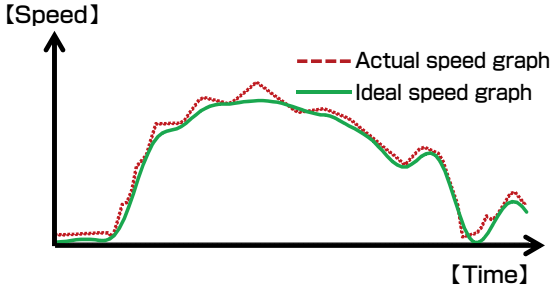
●Service example (TRIAS-TR-Saas Eco & Safety Benchmark Service)



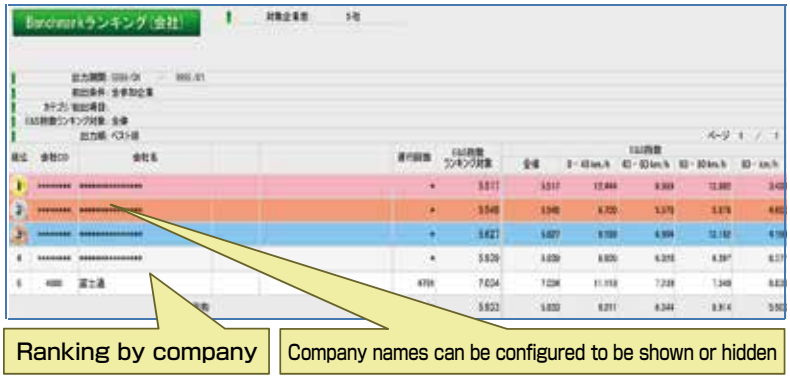
Drive data collected from digital tachographs is collected and analyzed at the cloud center to provide services which contribute to more ecologically friendly and safe driving, as well as reduced costs for transport companies.

【Shifting from sensory to quantitative evaluation of driving levels】

As shown at right, the differences in actual speed graphs and ideal speed graphs are calculated at the cloud center for use as quantitative (*) evaluations of driving levels.



[Service Content]
Collecting E&S index data in a cloud center makes it possible compare eco-driving and safe driving results against other companies, which was not possible in the past.
(Nationwide rankings can be compared for various categories, such as by company, by business site, and by driver.)



This encourage healthy competition, increased ecological and safety awareness, and contributes to further improvements.

(*) "E&S (Ecology & Safety) indices" indicate the level of ecologically friendly and safe driving by individual drivers, and make it possible to provide specific driving improvement guidance.

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 (%)

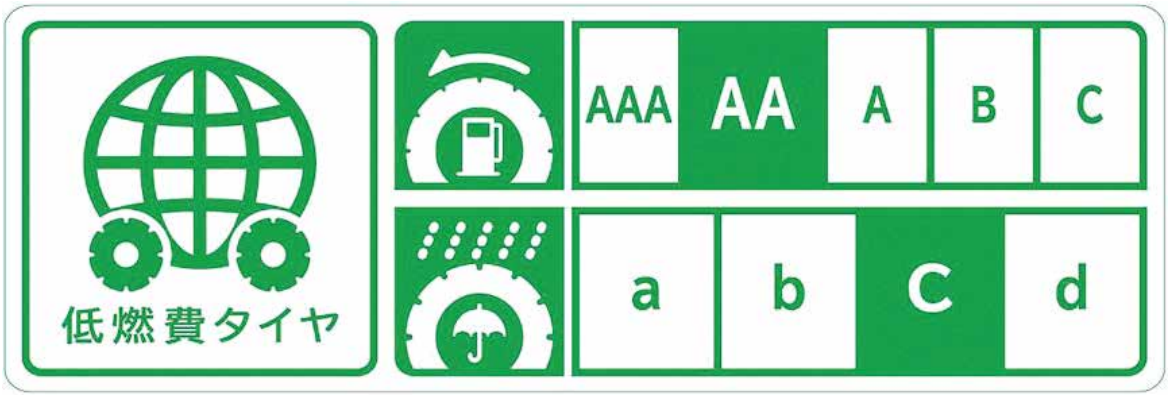
Wet grip performance (G)	Grade
155≦G	a
140≦G≦154	b
125≦G≦139	c
110≦G≦124	d

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)

●Service example

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)

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, and other efforts for promoting smart use of roads in order to provide smooth, safe transportation services. Furthermore, they are also maintaining and improving bicycle traffic spaces through the reallocation of road space, etc. In order to reduce the carbon footprint of road facilities, LED road lighting is being installed and renewable energy is being used.

■Deployment of ETC2.0 service

From October 2014 installed ITS spots and on-board devices have been used to provide “ETC2.0”, a new service, in addition to conventional automatic toll payment service, that provides driving support, etc., to drivers on expressways.

ETC2.0 is an information service which provides traffic jam avoidance support (by providing supplemantal visual images of traffic conditions ahead of drivers, and real-time, wide-area, accurate traffic jam information), safe driving support (by providing information on items which have fallen on roads, information on traffic jam tail ends, and information on hazards, such as still photos of weather conditions, etc.), and disaster support information (by providing appropriate information to users in the event of route closure). The route information obtained via ETC2.0 will also be used in new services, such as preferential treatment for drivers choosing routes which avoid traffic jams, etc., and operation and management support for commercial vehicles. Furthermore, consideration is also being given to the deployment of private sector services such as private parking lot payment and drive-through payment.

■Guideline for the creation of safe and comfortable bicycle use environments

Bicycles play an important role as familiar and easy to use means of transportation, but bicycle accidents are accounting for a growing share of overall traffic accidents. As health and environmental awareness grows, usage needs for bicycles are on the rise.

In 2007 the MLIT collaborated with the NPA on efforts for creating bicycle usage environments, designating 98 areas across Japan as "bicycle traffic environment model areas in order to further develop and maintain bicycle paths and dedicated bicycle lanes. In 2011 the MLIT collaborated with the NPA, holding exploratory committee meetings led by experts. In April 2012 the committee issued a recommendation for the prompt creation of guidelines across Japan focusing on both physical infrastructure and policies.

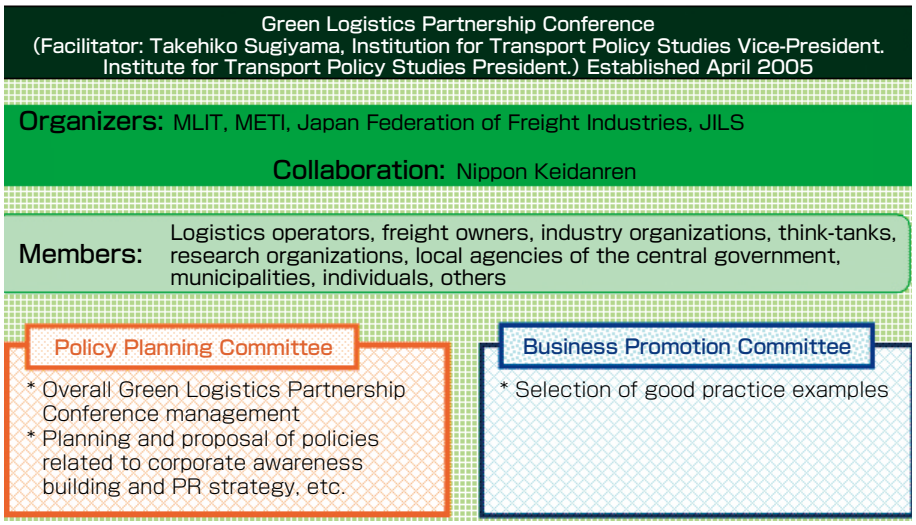
Based on this recommendation, in November 2012 the Japanese government formulated guidelines to assist road management authorities and prefectural police departments in creating and implementing bicycle network plans and thoroughly enforcing bicycle traffic rules. Furthermore, recommendations were summarized in December 2015 in preparation for the early formulation of the bicycle network plan and the early securing of safe bicycle traffic spaces.

④Improvement of freight distribution efficiency

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

○Green Logistics Partnership Conference

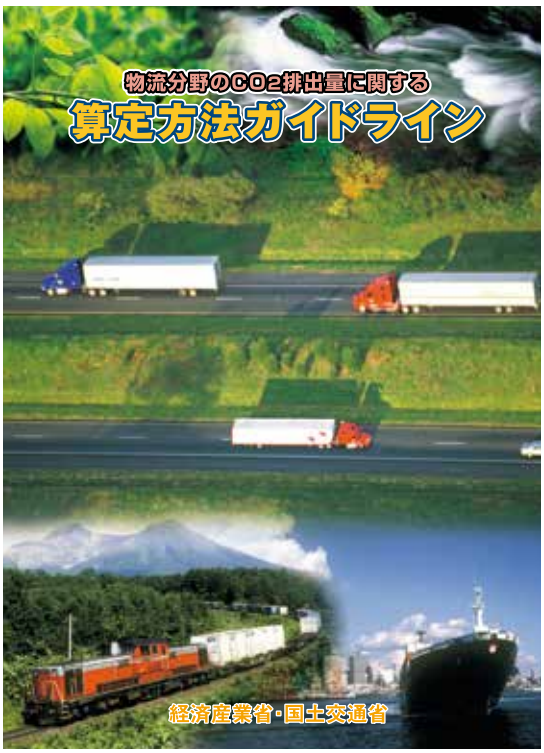
Promoting the creation of a greener overall logistics system requires greater collaboration between freight owners and logistics operators, and the expansion of global warming countermeasures creation of sustainable logistics systems for improving productivity, etc.



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

The Green Logistics Partnership Conference, launched in 2004 and composed of companies and organizations united by this goal, strives to implement and promote logistics improvement measures involving coordination between freight owners and logistics operators, with the support of the MLIT, in order to carry out modal shifts and improve truck transport efficiency.

As part of these activities, the Joint Guidelines on the Method for Calculating CO_2 Emissions by the Logistics Segment (Ver. 3.0) (METI, MLIT) were formulated. These guidelines establish a unified method of calculating carbon dioxide emissions by the logistics segment, 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 creation of sustainable logistics systems for improving productivity, etc. are recognized by MLIT awards.



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

■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). Since March 2015, 204 companies (94 cargo owners and 110 logistics operators) have received Eco-Ship Mark certification. Eco-Ship Mark certified companies are also selected to receive MLIT Maritime Bureau Chief awards.

Source: Committee for Implementation of Eco-Ship Modal Shift Operations (Tentative Translated by Eco-Mo Foundation)

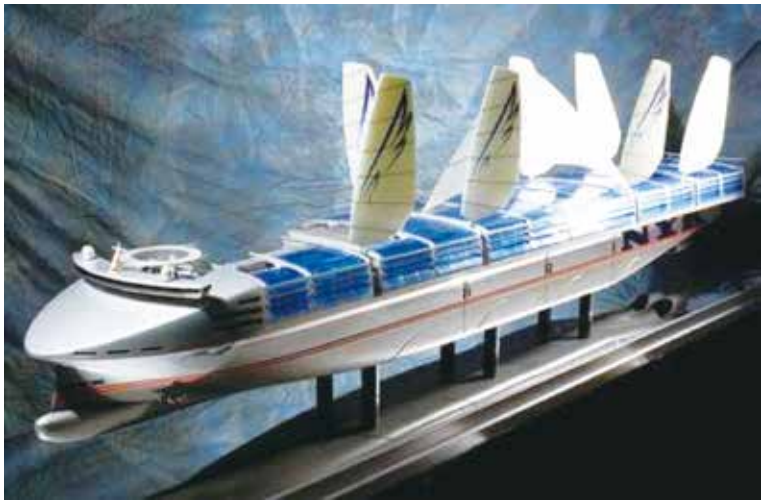
Column

Near-future Eco-ship Concept

The MLIT is developing and promoting low energy consumption vessels, etc. for domestic sea routes. At the same time, Japanese marine transport companies are deploying ocean-going eco-ships for use in international sea transportation, employing cutting edge energy saving technologies such as solar power generation and designs which reduce wind and water resistance. Near-future Eco-ship Concepts, which dramatically reduce energy consumption or emit no carbon dioxide, have also been announced. Belows are some examples.

●NYK Super Eco-Ship 2030

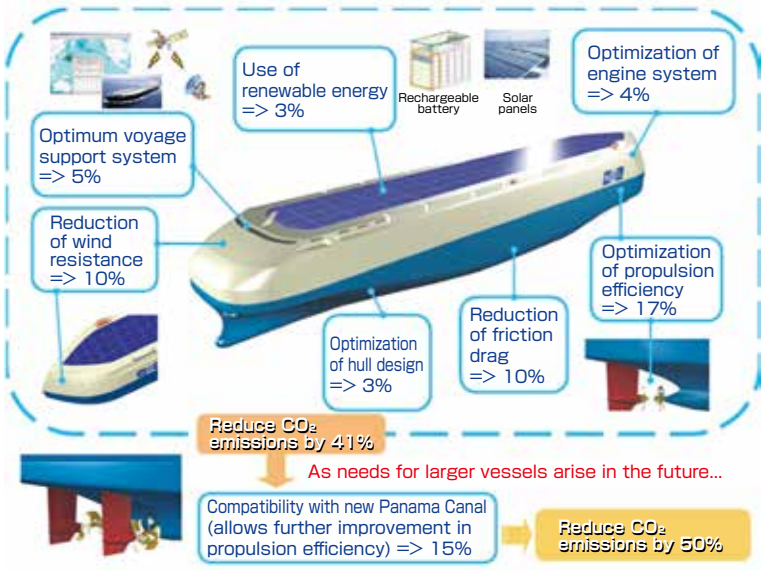
The "NYK Super Eco-Ship 2030" will reduce the amount of propulsive force it needs through its lightweight design and reduced friction resistance. It will use fuel cells powered by LNG, solar power, and wind power, with the aim of cutting CO2 emissions per container by 69% compared to current levels.



Source: Nippon Yusen Kabushiki Kaisha (NYK)

●"ISHIN-I" first next-generation car carrier

The "ISHIN-I" car carrier will further develop the natural energy usage technologies used in existing car carriers, employing large-capacity solar power panels and rechargeable batteries to achieve zero-emissions during in-port navigation, loading, and unloading. It also aims to cut CO2 emissions during open sea navigation by 50%, combining multiple new technologies to dramatically reduce its environmental impact.

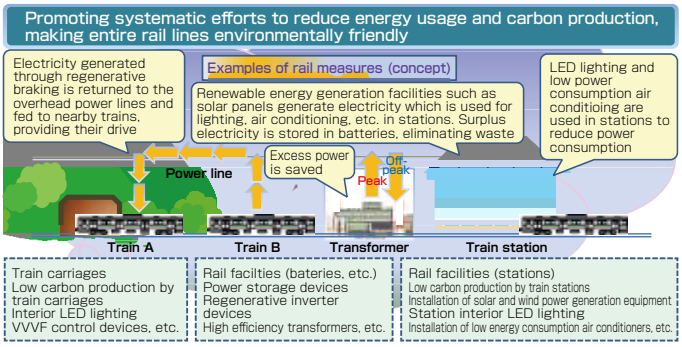


Source: Mitsui O.S.K. Lines, ltd. (Tentative Translated by Eco-Mo Foundation)

○Eco Rail Line Project

Railroads are essential parts of the daily lives and economic activities of the people of Japan. It is vital that they will be capable of maintaining regular operation even in the event of emergency situations such as power restrictions. Implementing cutting edge efforts to reduce energy consumption and carbon emissions from rail lines, which are used by 60 million people a day, contributes to greater societal energy conservation and environmental awareness. The MLIT is implementing the Eco Rail Line Project, supporting rail operators who are implementing systematic efforts to reduce power consumption and carbon emissions for entire rail lines by using renewable energy in train stations and train control centers and installing energy saving facilities for efficient energy usage. Through this support, the project promotes reductions in energy usage by rail lines and the adoption of carbon emissions reducing technologies.

●Overview of the Eco Rail Line Project



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

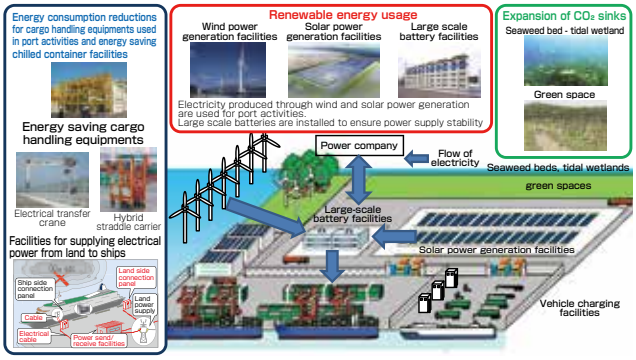
○"Eco Rail Mark" system promotion and expansion

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 cargo 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 are striving to further promote and expand the "Eco Rail Mark". As of August 2015 there are 161 "Eco Rail Mark" product certifications for 199 products, 86 certified companies, and 27 certified supporting companies.

Source: Railway Freight Association (Tentative Translated by Eco-Mo Foundation)

○Promotion of comprehensive reductions in carbon emissions by ports

In order to reduce the greenhouse gas emissions produced by port activities, comprehensive reductions in carbon emissions by ports, such as reducing energy usage by cargo handling equipment and other equipment, using renewable energy, and expanding CO2 sinks, are being implemented.

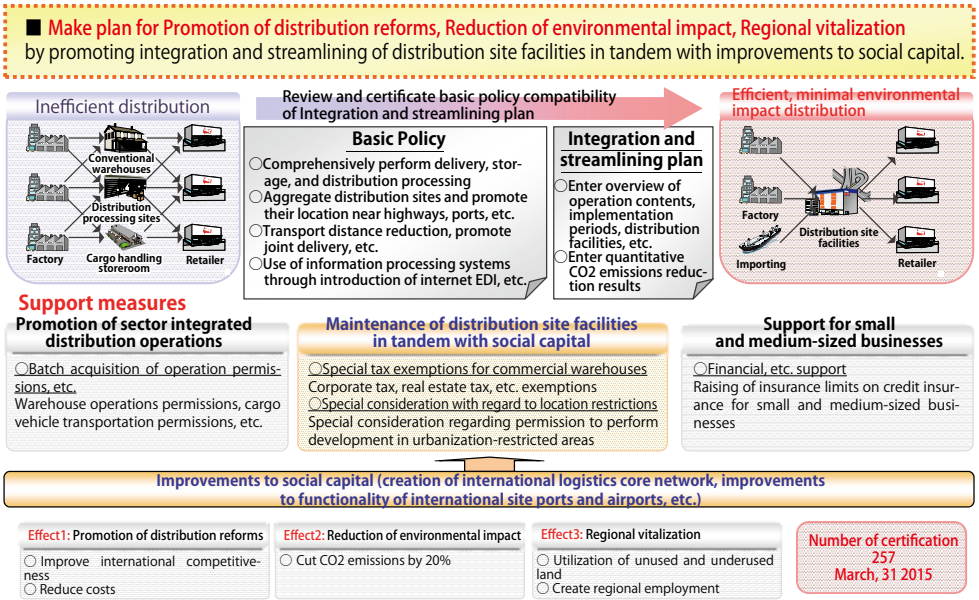


Source: MLIT (Tentative Translated by Eco-Mo Foundation)

Specifically, these include promoting the greater usage of land power supply facilities for providing energy to docked ships, promoting the greater usage of energy-saving cargo handling equipment, promoting the greater usage of energy-saving refrigerated container facilities, promoting the utilization of renewable energy such as solar and wind power in oceanic and coastal areas, and promoting the further development of green spaces and seaweed beds.

○The Act on Advancement of Integration and Streamlining of Distribution Business

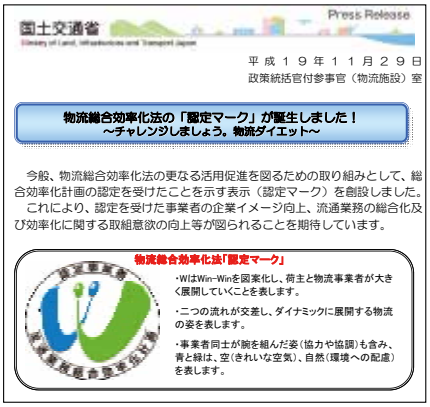
For freight distribution, which is the backbone of economic activity, it is becoming increasingly important to achieve greater international competitiveness through cost reductions, to provide services which meet the needs of increasingly diverse customers, and to create environmentally conscious distribution systems which help prevent global warming. Distribution must appropriately respond to changing social and economic conditions.



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

To promote the integration and streamlining of distribution operations, the Act on Advancement of Integration and Streamlining of Distribution Business was enacted in 2005. This act defines support measures and business plan certification procedures in order to promote the creation of distribution operation streamlining and integration businesses which perform comprehensive, efficient distribution operations such as transportation, storage, handling, and distribution processing, and the creation of distribution facilities which serve as the core of these business activities.

In order to promote the utilization of this act, a system of indicating companies which have received integration and streamlining plan certification (a certification mark system) was established. By the end of March 2015, 257 said plans had been certified. An "Act on Advancement of Integration and Streamlining of Distribution Business / Distribution Business Integration and Streamlining Plan Certification Application Guide" was released, containing explanations of the law, describing the benefits of certification, and providing information on subjects such as certification application procedures, for use by businesses engaged in operation integration and streamlining.


国土交通省
Press Release
平成１９年１１月２９日
政策統括官付参事官（物流施設）室
物流総合効率化法の「認定マーク」が誕生しました！
～チャレンジしましょう，物流ダイエット～
今般、物流総合効率化法の更なる活用促進を図るための取り組みとして、総合効率化計画の認定を受けたことを示す表示（認定マーク）を創設しました。
これにより、認定を受けた事業者の企業イメージ向上、流通業務の総合化及び効率化に関する取組意欲の向上等が図られることを期待しています。
物流総合効率化法「認定マーク」
・WはWin-Winを図案化し、荷主と物流事業者が大きく展開していくことを表します。
・二つの流れが交差し、ダイナミックに展開する物流の姿を表します。
・事業者同士が腕を組んだ姿（協力や協調）も含み、青と緑は、空（きれいな空気）、自然（環境への配慮）を表します。

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 green management promotion manuals containing checklists for self-assessment in order to promote environmental conservation activities by transportation 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 motivation, as well as fostering understanding of and cooperation with certified businesses by other companies and users, with the ultimate objective of reducing the environmental impact of the transportation industry.

(Manual of the Green Management Certification System)

⑤Promotion of usage of public transportation

Creating new railroad lines and new transportation systems, and making rail and bus transportation more convenient, contribute a shift in passenger transportation from private cars to public transportation, which has less of an environmental impact. This leads to reductions in automobile CO2 emissions, so various measures are being implemented in order to achieve this shift.

■Establishment of the Basic Act on Transport Policy

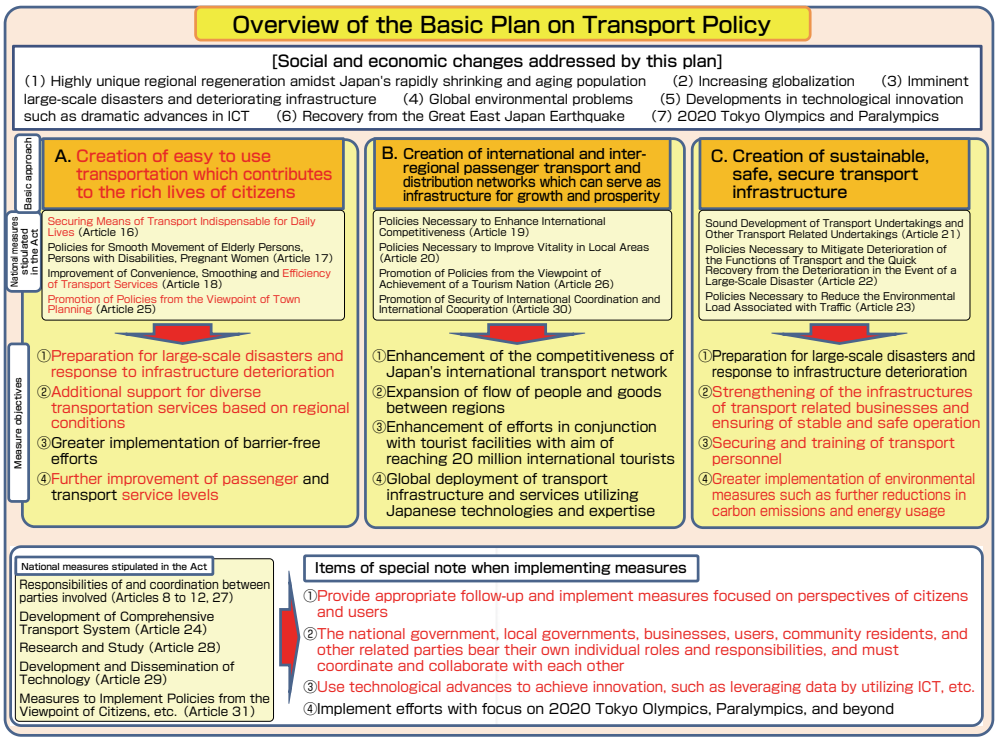
The Basic Act on Transport Policy was enacted on December 4, 2013.

This act 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 act clearly specifies the responsibilities of involved parties, and mandates that the Cabinet approve a Basic Plan on Transport Policy and present it to the Diet. The Cabinet approved the first Basic Plan on Transport Policy on February 13, 2015.

●Overview of the Basic Act on Transport Policy

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

●Overview of the Basic Plan on Transport Policy



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

■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.

●Service and convenience

◆Arterial railroad, etc. vitalization projects
- Conversion of cargo rail lines to passenger rail lines, Osaka outer loop line (Shin-Osaka to Hanate)

◆Rail station comprehensive improvement projects

Keikyu Corporation Keikyu Kamata Station, Seibu Railway Shiinamachi Station, Hanshin Electric Railway Koshien Station, JR East Kannai Station

◆City railroad convenience promotion projects
- Speed improvements - Sotetsu / JR through line (Nishiya Station - Yokohama Hazawa Station area), Sotetsu / Tokyu through line (Yokohama Hazawa area - Hiyoshi)
- Transport interchange function advancement - Hanshin Sannomiya Station

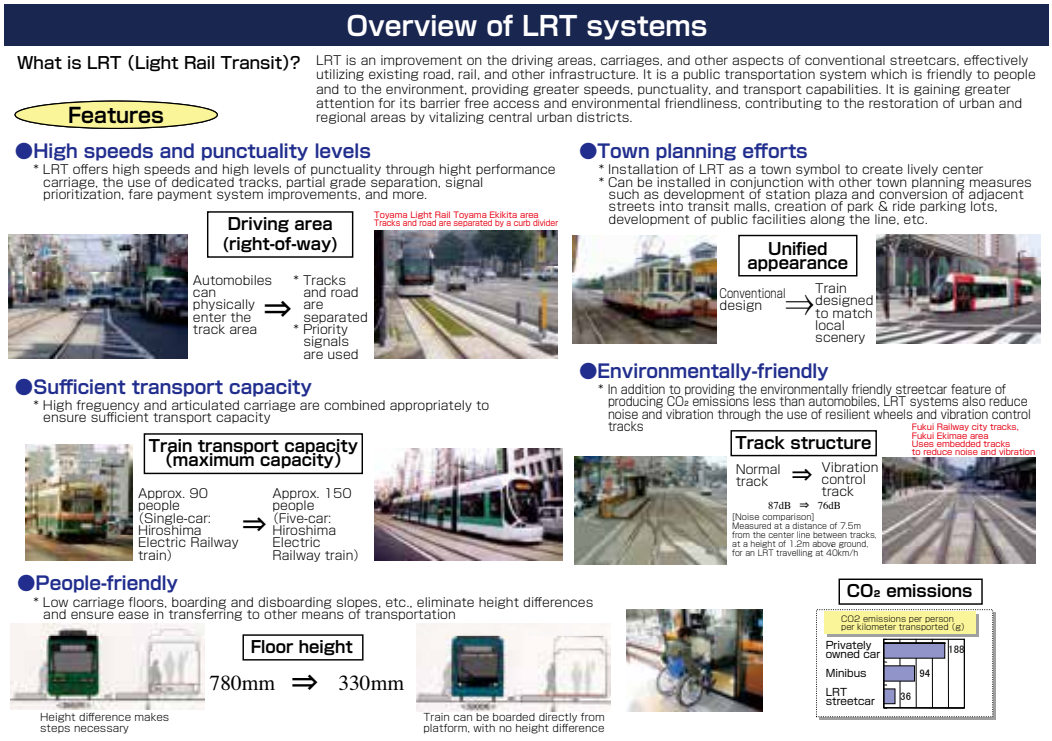
It is also collaborating with rail operators in the "Eco Rail Campaign", promoting the use of rail transportation as an handy environmental action.

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 regional public transportation provision, maintenance, and improvement project.

* LRT: Short for "Light Rail Transit". These next generation streetcar transportation 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



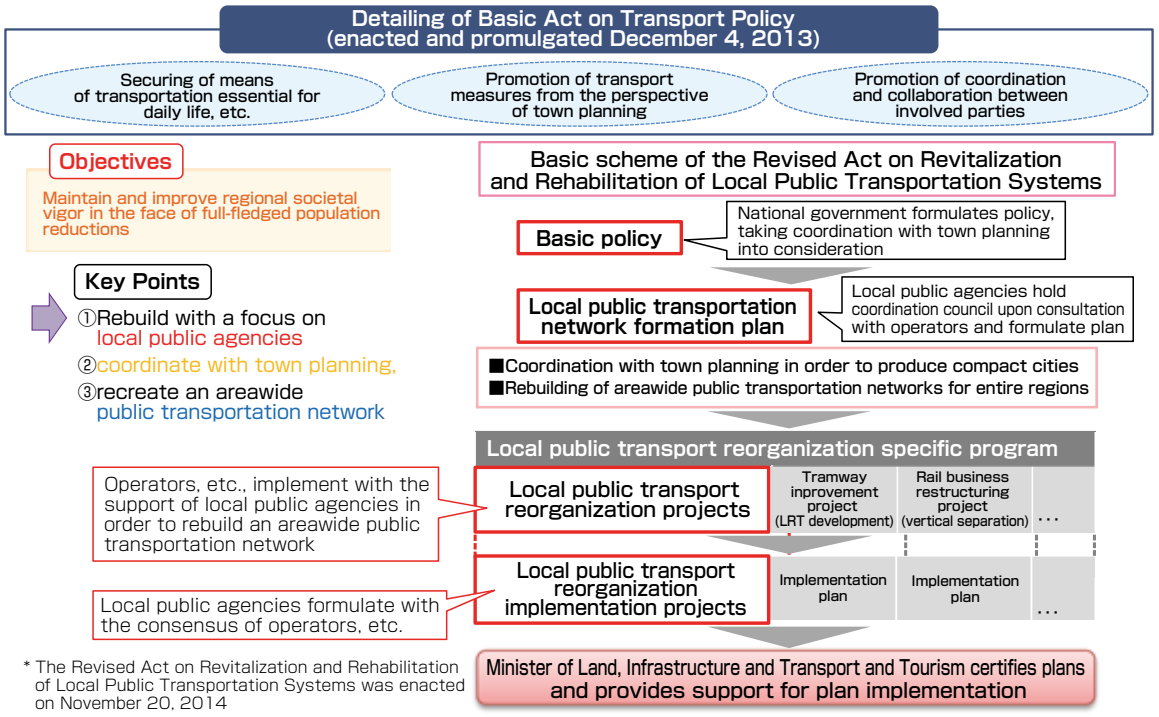
Source: MLIT (Tentative Translated by Eco-Mo Foundation)

Revised Act on Vitalization and Rehabilitation of Local Public Transportation Systems

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

Also, the August 26, 2015, the Revised Act on Revitalization and Rehabilitation of Local Public Transportation 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.

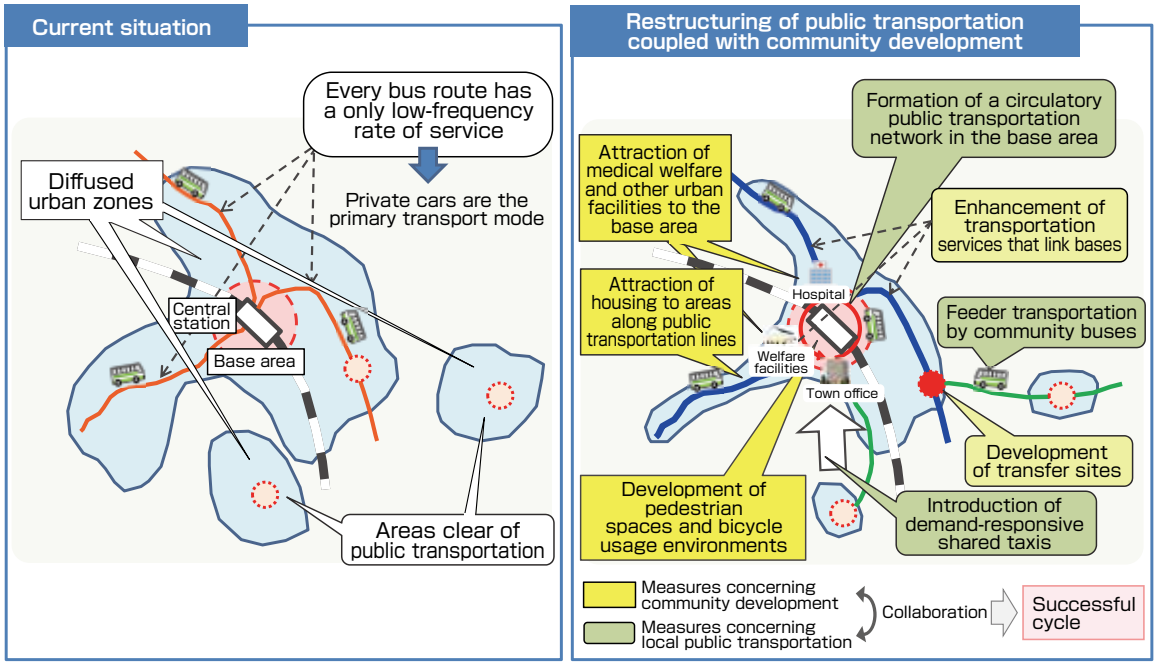
Overview of the Revised Act on Vitalization and Rehabilitation of Local Public Transportation Systems



* The Revised Act on Revitalization and Rehabilitation of Local Public Transportation Systems was enacted on November 20, 2014

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

Conceptual image of reconstruction of public transportation integrated with compact town development



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

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

●Overview of the Reviced Act on Revitalization and Rehabilitation of Local Public Transportation Systems and Japan Railway Construction, Transport and Technology Agency Act

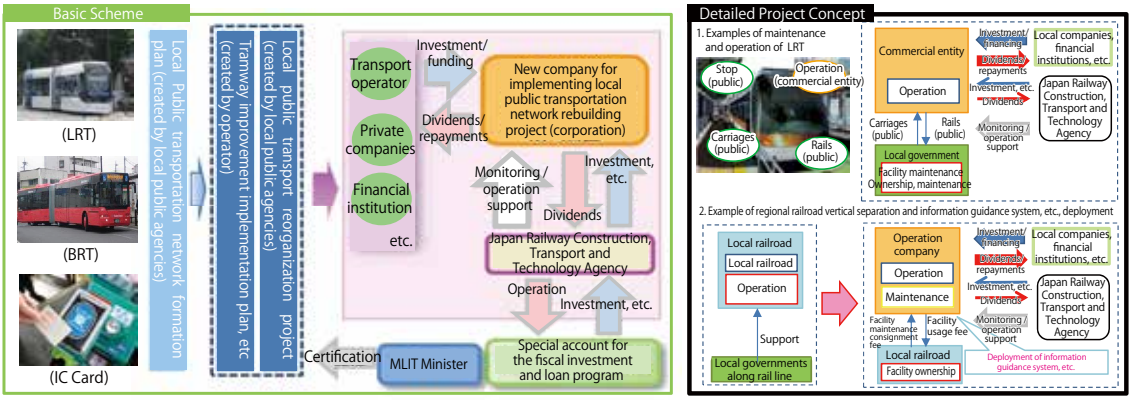
2014 Revised Act on Vitalization and Rehabilitation of Local Public Transportation Systems (drafted in May 2014, enacted in November 2014)

Creation of a system to ① Rebuild with a focus on local public agencies, ② coordinated with town planning, and ③ recreate an areawide public transportation network

Of these, initiatives such as the following require concentrated investment during their initial stages
* Deployment of new transportation systems such as LRT or BRT
* Deployment of IC card and information guidance systems integrated with revisions to routes and timetables

→ Large metropolitan areas and provincial cities of a certain scale, in particular, can be expected to be profitable in the medium- and long-term, so that effective support such as equity financing become more feasible.

◆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 transportation 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 Transportation Systems, and strengthen and diversify support for this system.



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

Promotion of eco-commuting

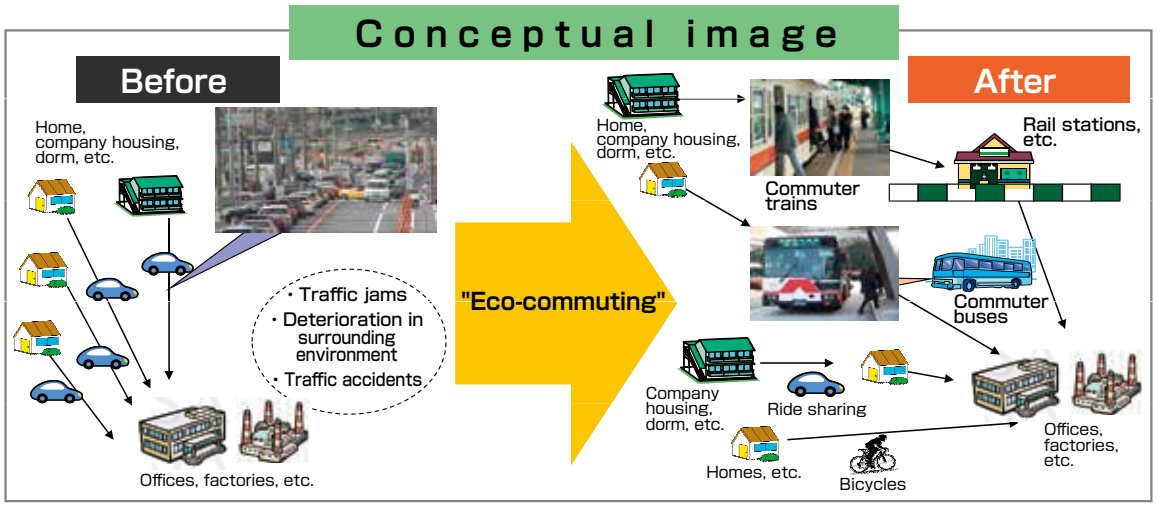
There is a growing demand for a shift in means of transportation, from the use of private cars to low carbon dioxide emission measure, by promoting the use of public transportation. In order to promote highly effective measures which match both user side and transportation operator side efforts, a Conference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

In November 2007 the "Eco-commuting Pilot Program through the Mobility Management Project" was adopted to promote conversion from the use of private cars to public transportation, 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 2015, 647 business sites have been registered.

What is "Eco-commuting"?

"Eco-commuting" is an approach that encourage company workers to change their means of commuting from private cars to public transportation, bicycles and on foot

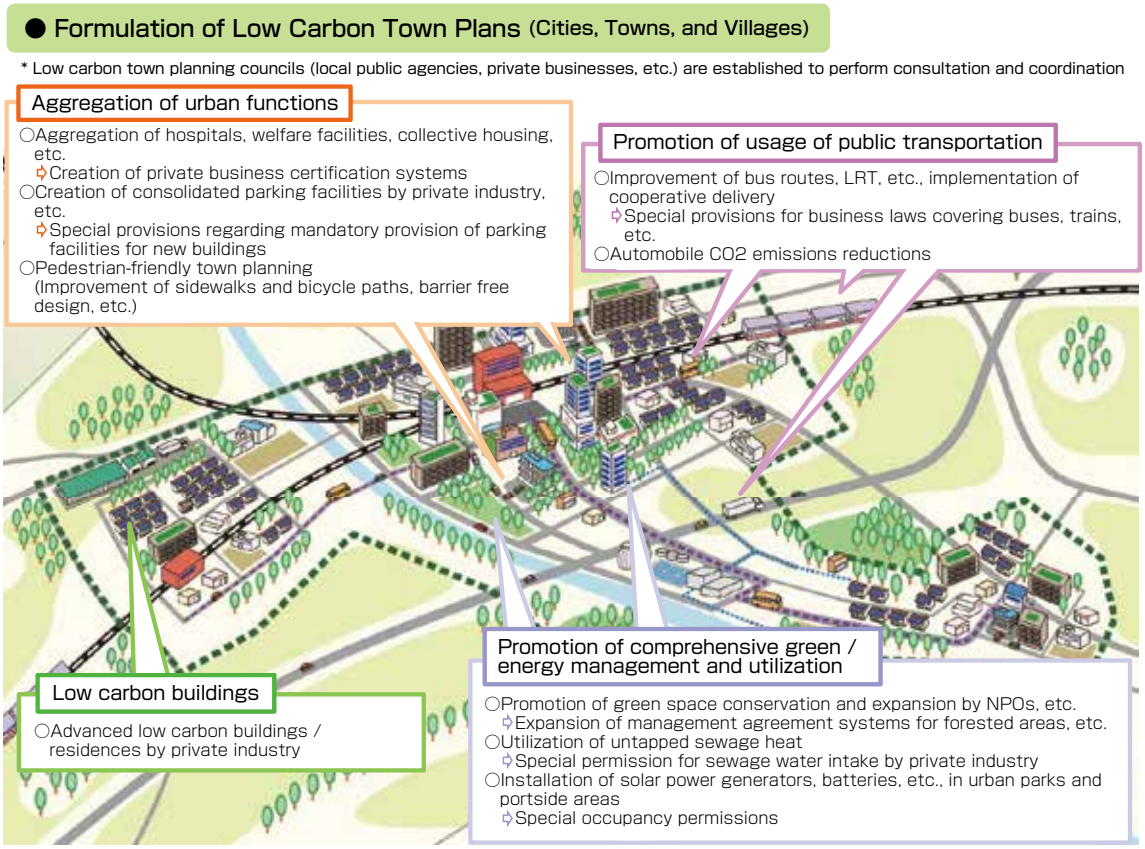


Source: MLIT (Tentative Translated by Eco-Mo Foundation)

■Low Carbon City Act

It is important to build up a collection of success cases of rationalization of energy usage and urban and transportation carbon emissions reductions, 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 Act was passed by the Diet in September 2012 and enacted in 2012 December of the same year. As of December 2015, 21 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 transportation, 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.

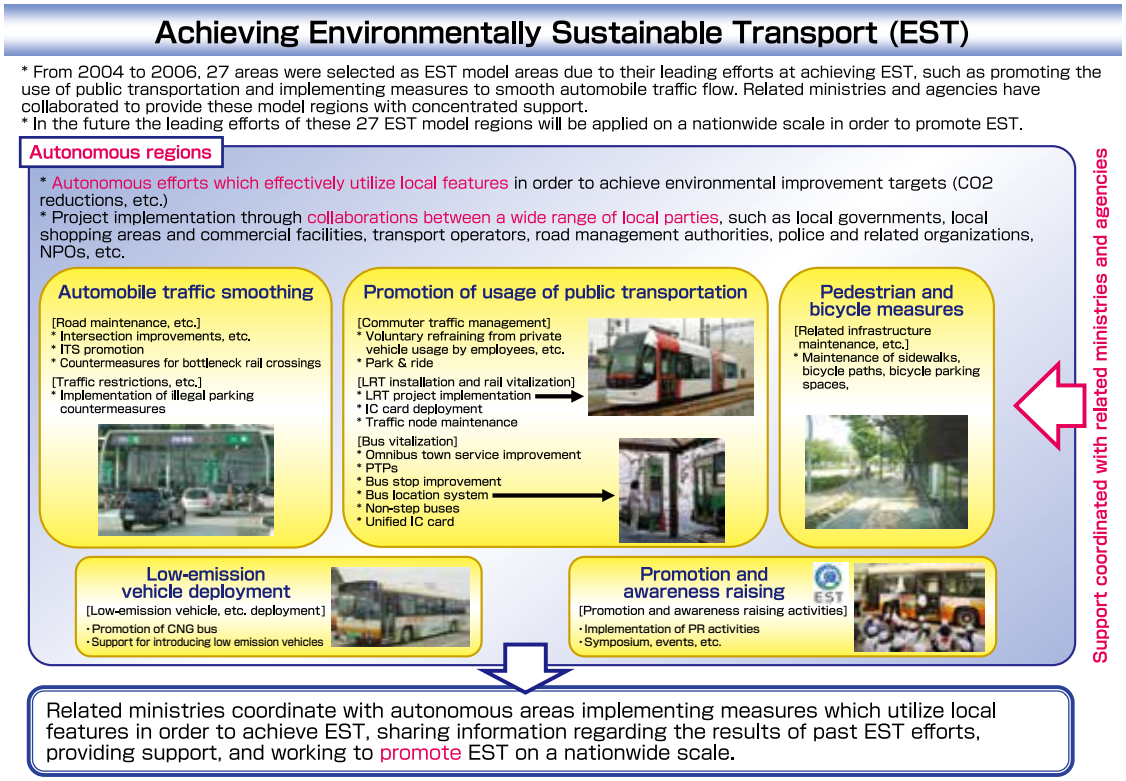
In order to achieve this, the MLIT has implemented an "EST Model Project", selecting areas which are implementing leading efforts at achieving Environmentally Sustainable Transport (EST), and related ministries and agencies collaborate to provide support in the areas such as promoting the use of public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

Over the three year period 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 Regional EST Forum in Asia is a high level governmental policy discussion forum, jointly created by the MOE and the United Nations Centre for Regional Development (UNCRD) with the aim of achieving Environmentally Sustainable Transport (EST) in the Asian region. Members include government officials in charge of environmental and transport issues from Japan and other like-minded countries in Asia, as well as environmental and transport experts. The first Forum was held in Nagoya in August 2005.

It was attended by 13 countries — 10 ASEAN countries, China, Japan, and Mongolia, and resulted in the adoption of the Aichi Statement. The Aichi Statement specifies that the Forum is to be held as a regular event, outlines the basic approach to EST in Asia, and states that the UNCRD will play a central role, assisting with the formulation and implementation of strategic plans and action plans for individual countries.

In April 2013 the 7th Forum was held in Bali, Republic of Indonesia. Representatives from 23 Asian countries and regions participated, sharing information regarding EST policies and success cases. The Bali Declaration was adopted, affirming further promotion of EST and complementing the Bangkok Declaration for 2020, formulated at the 5th Forum, held in 2010, specifying EST targets.

At the 8th Forum, held in November 2014, the Colombo Statement was adopted aiming to promote low-carbon transportation in Asia. The Special Session for city mayors in Asia was convened, reviving interest in the Kyoto Statement adopted in 2007 to promote environmentally sustainable transport in Asia, and issuing a supplementary note to strengthen such actions in this regard.

In November 2015 the 9th Forum was held in Kathmandu, Federal Democratic Republic of Nepal.

●9th Forum opening ceremony

Comprehensive support for energy creation, storage and saving in towns, residences and transport

Japan is facing unprecedented challenges, such as a shrinking and aging population, financial constraints, intensifying international competition, and energy restrictions prompted by the increasingly severe global environmental situation and Japan's earthquake and nuclear power plant disaster. In order to overcome these challenges and create a brighter future for Japan, the MLIT is working as one to carry out sustainable, energetic national and regional planning. The creation of a low carbon, recycling-oriented society is one new direction of policy development, and is an essential part of creating a sustainable society.

In disaster-affected areas, Future Cities, and comprehensive special zones, regional local governments, private businesses, and others are taking the lead in considering how to create a low carbon, recycling-oriented society. The MLIT is engaged in a wide range of fields closely tied to the economy and the lives of citizens. In these fields, the Ministry is providing comprehensive support for leading efforts by regions and businesses to create, store, and save energy in towns, residences, and transport by demonstraiting practical capabilities, responsive capabilities, and comprehensive capabilities.

The Ministry is also supporting the formation of advanced concepts by local governments and private businesses for the creation of models tailored to city scales and local features, etc., in order to create, store, and save energy in towns, residences, and transport.

●Planning supports for comprehensive support model creation for energy creation, storage and saving in towns, residences and transport

2012

Region	Sponsor (Representative Organization)	Cosponsor	Title
Hakodate City, Hokkaido	TO Ogasawara Co., Ltd.	Mitsubishi Heavy Industries, Ltd. Mitsubishi Motors Corporation JTB Corporate Sales Inc. Hakodate Jikoh	Hakodate excursion network concept based on new energy and EV mobility - Striving to create a self-sufficient region by leveraging diverse forms of energy -
Hirosaki City, Aomori Prefecture	Hirosaki City		Town planning concept for local energy production and consumption using Hirosaki's local resources - "Creating", "Moving", and "Storing" by converting to green hydrogen energy -
Tsukuba City, Ibaraki Prefecture	Daiwa House Industry Co., Ltd. Tsukuba Branch	NTT Urban Development Corporation Placemaking Institute Inc..	Realizing the Tsukuba Environment Style "SMILe" Citizen-led sustainable community model concept
Kurashiki City, Okayama Prefecture	JFE Shoji Corporation, Okayama Branch	Sumitomo Mitsui Auto Service Co., Ltd Kurashikijisho Co., Ltd. Mitsubishi Motors Corporation Nishinihon Mitsubishi Motors Corporation Marugo Rubber Industries, Ltd. Kurashiki Machidukuri Co. Kurashiki Seibou Co., Ltd. Inoue Co., Ltd. Kamoi Kakoshi Co., Ltd. Kurashiki Ivy Square Co., Ltd. Marubun Corporation Co., Ltd. Hagihara Industries, Inc. Kurashiki chamber of commerce	EV / PV-centered corporate community-led Kurashiki vitalization and greening concept - Implementing a regionally-based energy creation, storage, and saving model -
Satsumasendai City, Kagoshima Prefecture	Satsumasendai City		Striving to create a town led by the model concept of promoting tourism and exchange between residents by using Satsumasendai's local diversity - A city, supported by energy, where people want to go, share, and live -

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

2013

Region	Sponsor (Representative Organization)	Cosponsor	Title
Urayasu City, Chiba Prefecture	Urayasu City		Urayasu City urban waste heat utilization model concept - Highly sustainable heat utilization system that leverages existing urban sewer infrastructure -
Osaka City, Osaka Prefecture	TAIKA logistics Solution LLC	Sakishima-Asia Smart Community Alliance	Limited lease low carbon industrial and logistics park concept for the Osaka Bay Yumeshima District - Model for creating a low carbon, low cost port district using infrastructure for mutual sharing of electricity and heat and a joint freight distribution system -
Anjo City, Aichi Prefecture	Denso Corporation	Anjo City Anjo Style Company Toyota Tsusho Corporation	Concept for city vitalization through the deployment of low carbon mobility and creation of an "Anjo Model" through harmonious coexistence with industry - Striving to turn Anjo into an environmental capital that grows with its residents -
Takaoka City, Toyama Prefecture	Takaoka City		Concept for achieving low carbon mobility by leveraging Takaoka's trams - Striving for local public transport intimately tied to residents' activities and awareness -
Yanagawa City, Fukuoka Prefecture	Nishitetsu Information System Co., Ltd.	Hewlett-Packard Development Company, L.P. Nishimu Electronics Industries Co., Ltd. KCS Corporation	Yanagawa area tourism promotion concept - Creating a dynamic tourist town of interaction and interchange of people and goods by leveraging energy creation, storage, and saving -

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

2014

Region	Sponsor (Representative Organization)	Cosponsor	Title
Kanagawa Prefecture Odawara City	Odawara City	Houtoku Energy Co., Ltd. Odawara Gas Co., Ltd. Dynacity Corporation	Odawara City Nakazato Area Energy Network and Low Carbon Transportation System Modeling Concept - Urban development using locally generated energy, creating cities where anyone can go out freely using environmentally-friendly transportation -
Nagano Prefecture Matsumoto City	Matsumoto City		Matsumoto City, Shiga Region Hilly Area Energy Creation and Storage Modeling Concept - Using community activities led by residents of hilly areas with declining and aging populations -
Osaka Prefecture Osaka City	Osaka City	Kansai Electric Power Co., Inc. Osaka Gas Co., Ltd. Nippon Telegraph And Telephone West Corporation	Umekita Phase 2 District Energy Concept - Creation of models of energy systems contributing to the implementation of the Osaka energy local generation and local consumption promotion plan -
Hyogo Prefecture Kobe City	Kobe City		Kobe Center Sannomiya Region Next Generation Smart Energy Infrastructure Concept - Creation of a conduit line network utilizing existing underground commercial areas -
Kagoshima Prefecture Yakushima Town	Energy Efficient Construction Institute	Yakushima Town Junior Chamber International Yakushima	Yakushima Clean Energy Island Concept - Discovering optimal environment sharing methods in order to create an energy-efficient, locally circulating regional economy -

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

2015

Implementing Region	Sponsor (Representative Organization)
Sapporo City (Hokkaido)	Sapporo City
Nagai City (Yamagata Prefecture)	Nagai City
Hokuei Town (Tottori Prefecture)	Hokuei Town
Kitsuki City (Oita Prefecture)	Kitsuki City
Yatsushiro City (Kumamoto Prefecture)	Yatsushiro Future Development Council

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

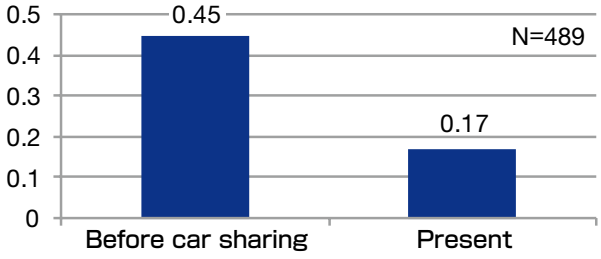
Column

Effectiveness of car sharing in reducing environmental impact

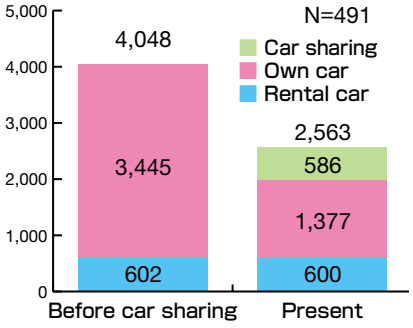
Car sharing, in which people can use cars when they need them, without owning the cars, is growing in popularity worldwide. Over 680,000 people in Japan utilize in car sharing (according to March 2015 research by the Eco-Mo Foundation).

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 CO2 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.

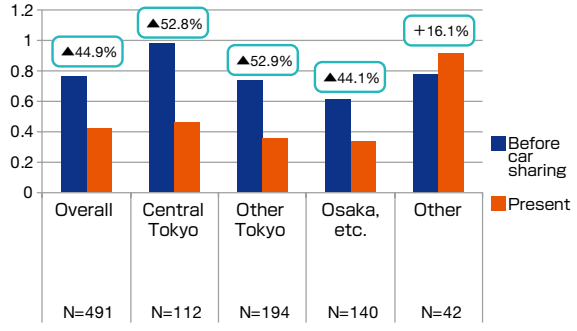
●Change in average number of automobiles owned per household



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



●Change in annual CO2 emissions from automobile use (t-CO2/year/household)



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

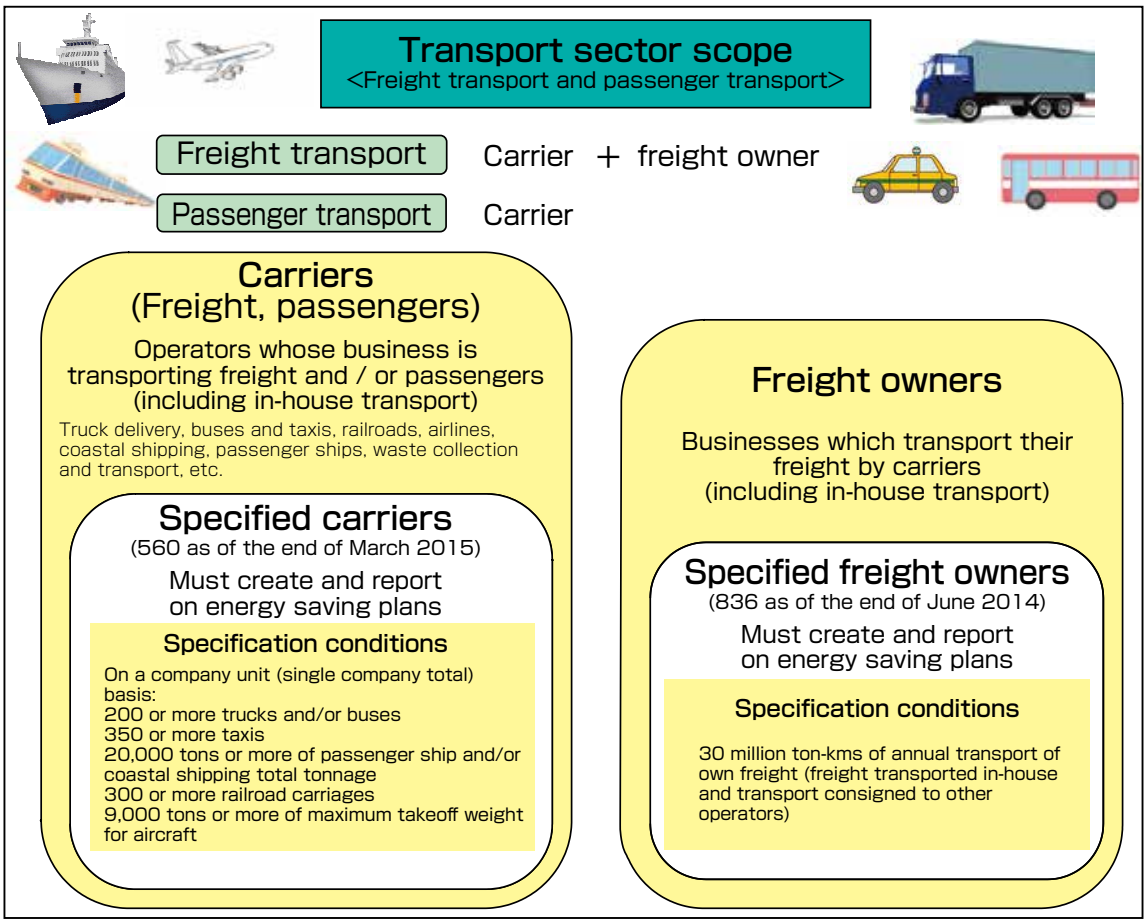
Note 2) Osaka, etc: Osaka Prefecture, Hyogo Prefecture, Kyoto Prefecture, Aichi Prefecture, Kanagawa Prefecture

(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. Operators (specified operators) 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. The transport sector was added in the April 2006 revision to the Act.

In order to ensure energy reductions within freight distribution sector, the Act applies not only to carriers but freight owners as well.



Specified carrier designation status (total of 560 companies as of the end of March 2015)

	Freight				Passengers				Aviation	Total
	Railway	Commercial trucks	Private trucks	Shipping	Railway	Buses	Taxis	Shipping		
No. of carriers	1	281	86	32	26	94	26	12	2	560

[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 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 · 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 · Promote eco-driving through driver education and use of digital drive records, etc. · 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 · Implement reduced energy consumption operation, such as economical speed operation · Promote increases in ship sizes in accordance with freight volume · Perform cooperative 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 reduction of 1% in energy consumption rates or electrical demand equalization evaluation rates by implementing measures such as those below:

· Appointing energy saving measure administrators
· 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 tracks to commercial trucks
· Performing cooperative delivery with other companies

etc.

(3) Emissions trading system measures

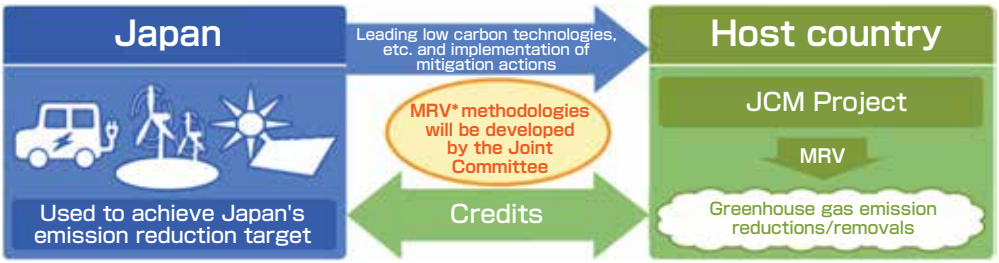
The Japanese government has proposed a Joint Credit Mechanism (JCM) for international emissions trading. With the end of the adjustment period for the first commitment period of the Kyoto Protocol (by 2015), countries not participating in the second commitment period cannot internationally transfer or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

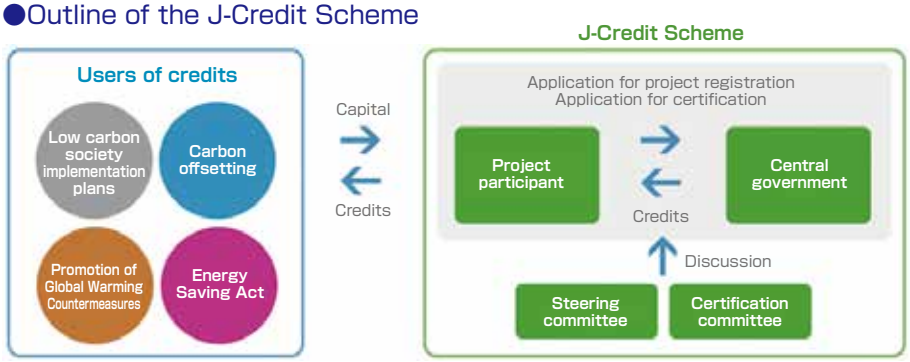
■J-Credit Scheme

The J-Credit Scheme is system in which reductions and absorption of greenhouse gasses such as CO2 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.

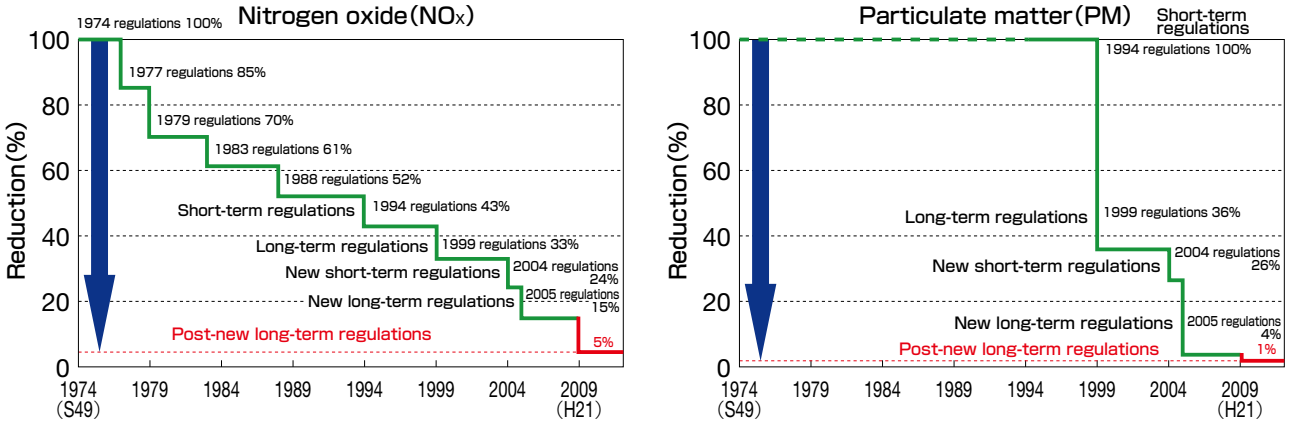
The problem of vehicle exhaust gas became a serious social problem with the rapid urbanization which began in the mid-1960s and the increase in vehicle traffic. The government strengthened exhaust gas regulations by enacting vehicle composition regulations and repeatedly revising road vehicle safety and emission standards. In 1992 the Automobile NOx Reduction Law (now the Automobile NOx PM Control Law) was enacted. In urban areas where there are some difficulty in achieving air quality standards targets, local governments, starting with Tokyo's local government, have implemented operation restrictions, primarily on diesel vehicles, which produce a great deal of PM emissions.

(1) Promotion of emissions gas measures for diesel vehicles

①Restrictions on manufacturers

Post-new long term regulations, some of the strictest regulations in the world, went into effect in 2009. These regulations almost completely prohibit the emission of particulate matter (PM), carcinogenic matter which is a cause of respiratory disorders. They also greatly reduce emissions of photochemical smog, also a cause of respiratory disorders, and of nitrogen oxides (NO2, etc.), which are air pollutants which cause acid rain. These regulations have almost completely solved the long-standing problem of particulate matter emissions by diesel vehicles, with older diesel vehicles being gradually 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, 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 influx 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 trafic, 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 mini vehicles, 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 8t or more which cannot be registered due to their use being based in non-regulated areas specified by the Automobile NOx/PM Control 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

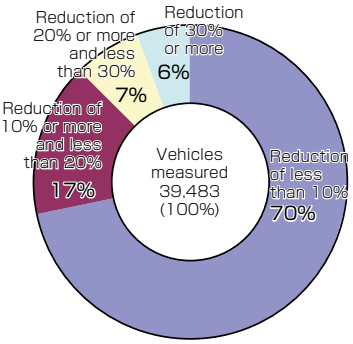
①Appropriately maintained vehicle usage

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 study 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.

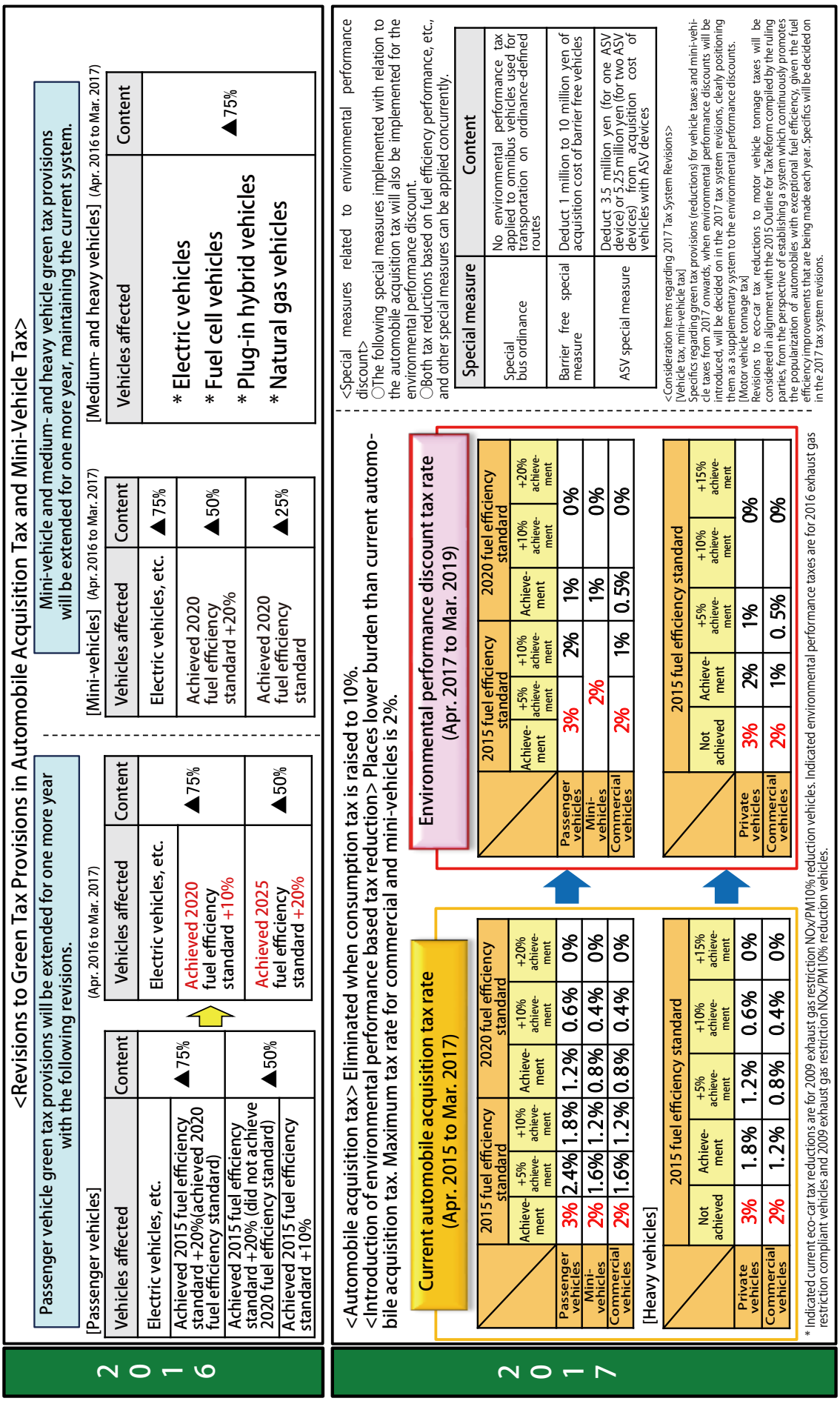
●Illegally dumped sulfate pitch which has leaked out of its containers

An illegal diesel fuel which mixes diesel oil and A-type huel 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 Environmentally friendly vehicle promotion measures (vehicle taxation reevaluation)

The 2016 automobile acquisition tax and mini-vehicle tax green tax provision revision and extension, and the 2017 introduction of environmental performance based tax reduction, are described on the following page.

〈Motor vehicle tonnage tax, automobile acquisition tax, mini-vehicle tax, etc.〉



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

4 Creation of a recycling-oriented society

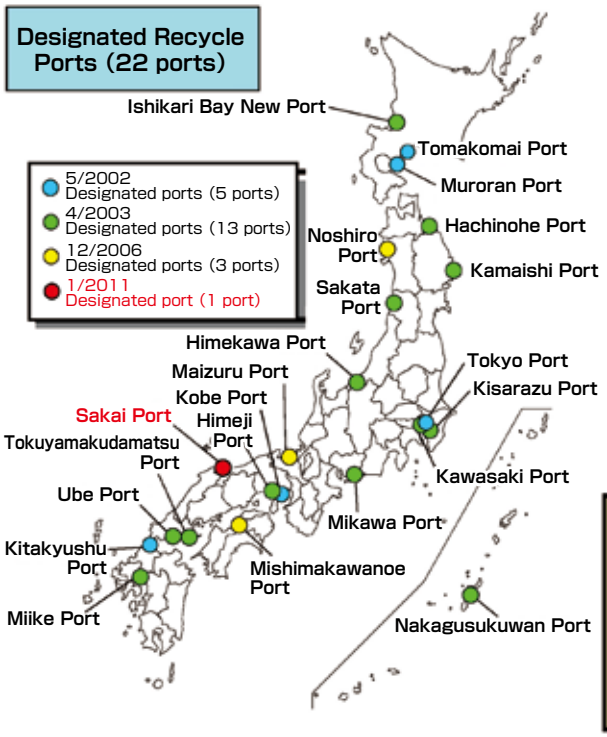
(1) Creation of recyclable resource distribution systems

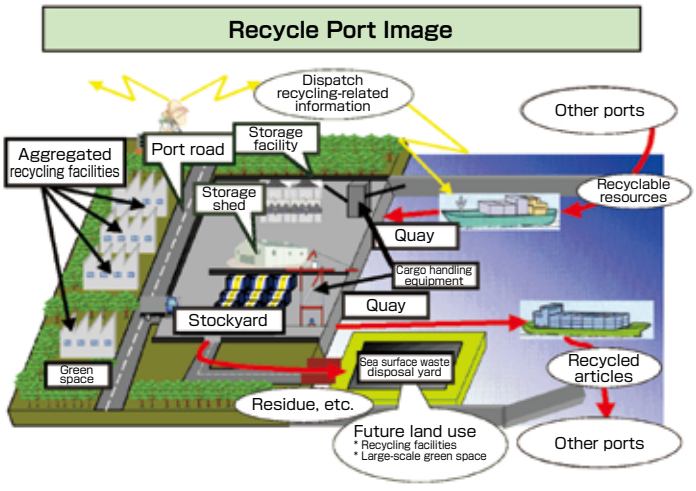
①Formation of a recyclable resource distribution system using sea transport

The Basic Plan for Establishing a Recycling-Based Society puts forth the concept of building a port-centered comprehensive reverse logistics system in order to create a recyclable resource environment for achieving a recycling-oriented society. Based on this plan, Recycle Ports, recyclable resource distribution ports which support wide-area recycling sites, are being established. 22 of these ports have been designated as of January 2011. In conjunction with this, additional measures have been implemented such as securing quays specifically for handling recyclable resources, maintaining recyclable resource distribution support facilities such as enhancing the functionality of drainage ditches and protective fences, promoting collaboration between government and private industry through the Recycle Ports Promotion Council, and formulating the Guidelines on the Handling of Recyclable Resources by Ports (2004) for smooth recycling distribution and the Policy on the Handling of Recyclable Resources by Ports (2010) for efficient port operation and recyclable resource handling. These efforts have advanced the formation of a domestic recyclable resource distribution network which utilizes sea transport.

●Recycle Port locations and Recycle Port image

○Ports are specified as Recycle Ports to serve as centers of wide-area circulation of recyclable resources.
○The following efforts have been implemented as part of Recycle Port measure implementation.
(1) Securing port facilities such as quays, (2) Providing support for the maintenance of shipment transfer and storage facilities, etc. (subsidized with subsidy rate of 1/3)
(3) Improvement of operations related to recyclable resource handling, (4) Promotion of coordination between the government and private industry (use of the Recycle Ports Promotion Council, etc.)





Benefits of creation of a network of recyclable resource logistics sites

○Support for the creation of a recycling-oriented society by promoting nationwide material recycling
○Reduction of environmental impact through use of sea transport
○Recycle cost reduction through recycling facility aggregation and use of sea transport
○Vitalization of port area industry through promotion of use of locations for recycling facilities

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

②Systematic securing of sea surface waste disposal yards

In order to respond to the pressing problem of waste disposal, The Basic Plan for Establishing a Recycling-Based Society puts forth the concept of building a port-centered final waste disposal is being performed of general waste which must be disposed of in landfills after appropriate recycling and waste volume reduction. This is being performed at sea surface waste disposal yards in ports across the country, while ensuring sufficient consistency with appropriate port development, usage, and conservation. In particular, based on Osaka Bay Phoenix Plan, a wide area disposal yard improvement project, general waste is being accepted and processed for cities, towns, and villages within designated areas in the Osaka Bay area.

Soil produced by construction in the Tokyo area, which the area is having difficulty disposing of, is being effectively used over a wide area as a construction material in ports across the country as part of the Super Phoenix Project.

●Osaka Bay Phoenix Plan

Source: Osaka Bay Regional Offshore Environmental Improvement Center

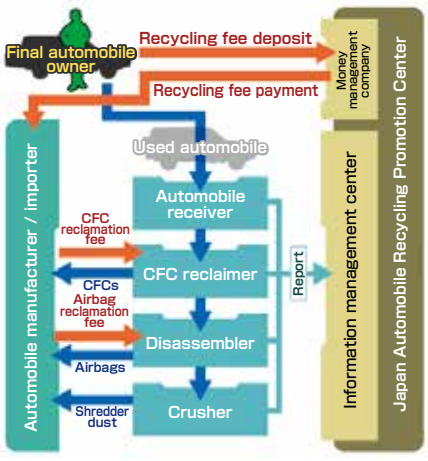
(2) Creation of vehicle recycling system

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 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 5,192 at the end of 2014 (a decrease of 97.4% versus the number in 2004), and the number of illegally dumped

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



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

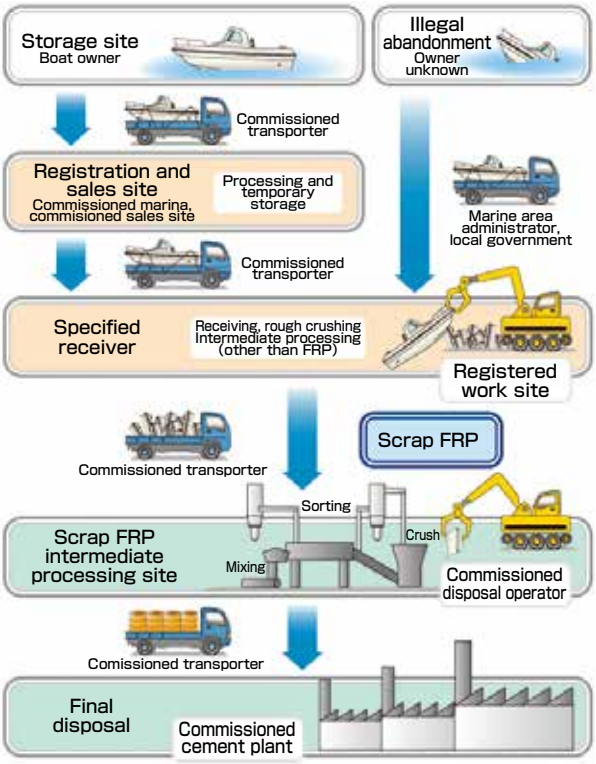
vehicles was 1,924 (a decrease of 91.5% versus the number in 2004), succeeding in both dramatic reductions.

(3) FRP ship recycling

Fiber-reinforced plastic (FRP) boats and ships are distributed widely across Japan. They are sturdy, with lifespans of over 30 years. This makes them difficult to dispose of, and this, together with the lack of appropriate disposal routes, is one of the reasons that they are illegally dumped.

Ship and boat manufacturers, led by the MLIT, have collaborated together to create procedures for appropriately disposing of FRP ships, promoting the establishment of a recycling-oriented society, by establishing appropriate and efficient recycling technologies. Based on these technologies the Japan Marine Industry Association FRP Ship Recycling Center has led the way in using the recycling and reuse operator wide area accreditation system (a system which exempts manufacturers from requiring waste processing permits to reclaim and recycle used products, etc.) of the Wastes Disposal and Public Cleansing Act to promote FRP ships recycling, starting in 2005 with a limited number of areas, and extending nationwide from 2007.

●FRP ship recycling system



Source: Japan Marine Industry Association FRP Ship Recycling Center (Tentative Translated by Eco-Mo Foundation)

Source: MLIT Chugoku District Transport Bureau

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

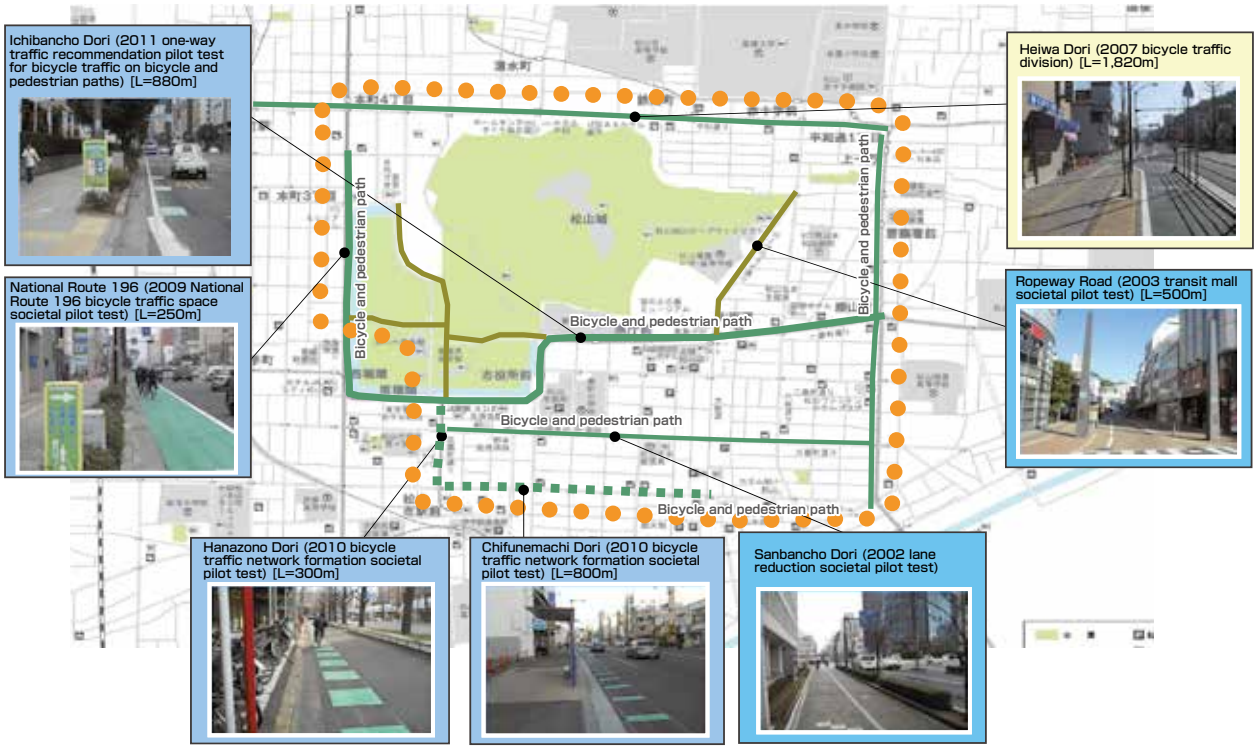
(1) Measures by local governments

Local governments are implementing global warming countermeasures, tailored to their local features, in the transport and traffic sectors. This section looks at efforts by Matsuyama City (population: 520,000), Gifu City (population: 410,000), and Toyama City (population: 420,000).

■Matsuyama City - Pedestrian-friendly town planning -

In order to create a sustainable city with convenient transport that is people-friendly, community-friendly, and environmentally-friendly, Matsuyama City has formulated a comprehensive transport strategy whose goal is to shift from the current automobile-centric transport system to one which offers convenient access via public transportation and bicycles.

Efforts have included promoting the use of public transportation through an omnibus town plan, etc., and promoting the use of bicycles through the formation of a bicycle path network, etc., as well as soft measures implemented through mobility management and social field tests of the Dogo Mobility Center, which enables residents to choose from a diverse range of means of mobility.



Social field tests have been carried out using various methods to study bicycle path networks

Source: Shikoku EST Emergence Seminar Matsuyama City materials (Tentative Translated by Eco-Mo Foundation)

■Gifu City　- Public transportation-centered town planning -

Gifu City is striving to develop a bus network which combines central lines, branch lines, and community buses in order to create a healthy city of healthy people. In particular, it is implementing the Gifu City BRT to provide greater convenience by enhancing central bus routes.

■The concepts of BRT development in Gifu City

【Basic policy of urban transport measures】

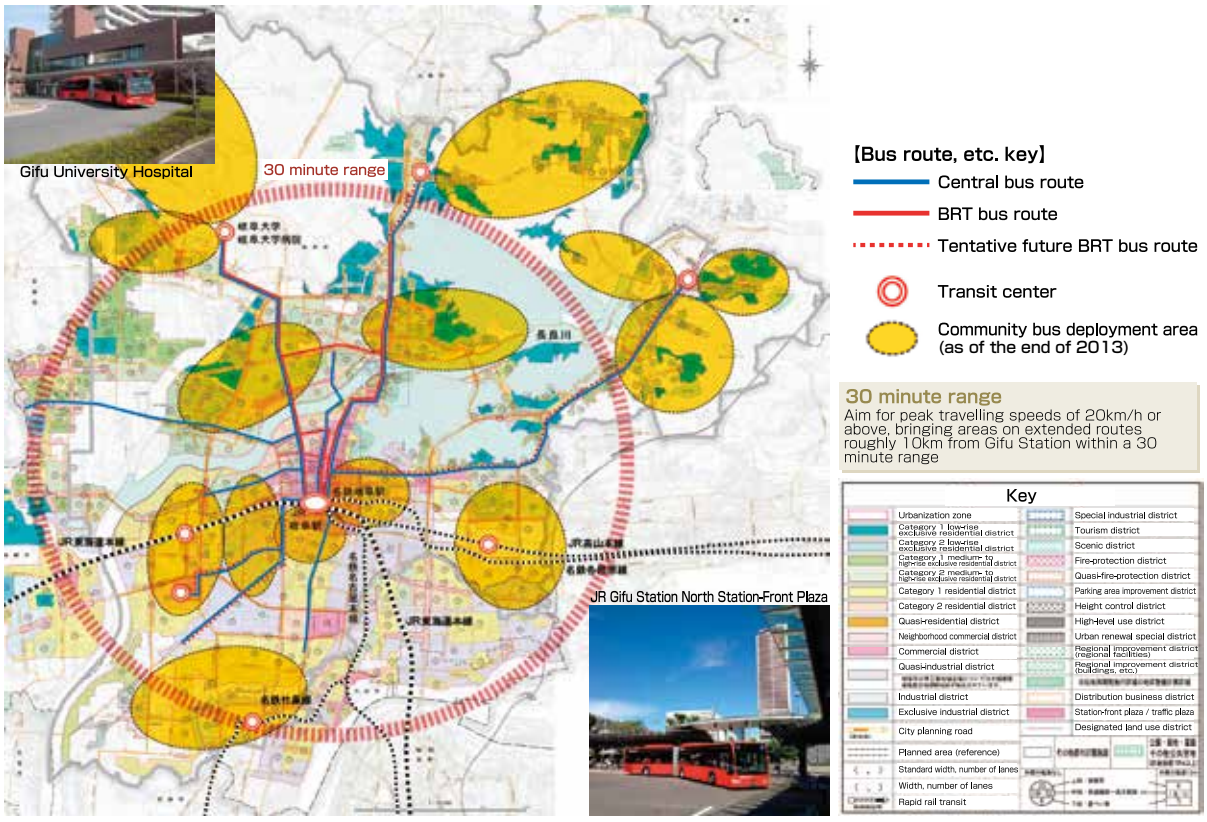
Create a transport environment which provides everyone with freedom of mobility in order to create a consolidated city structure

【Public transportation service targets】

1. Establish a bus network which combines central lines, branch lines, and community buses
2. Improve central bus route service, making it possible to reach areas up to roughly 10km away from Gifu Station within 30 minutes via extended bus routes

【Gifu City BRT implementation policy】

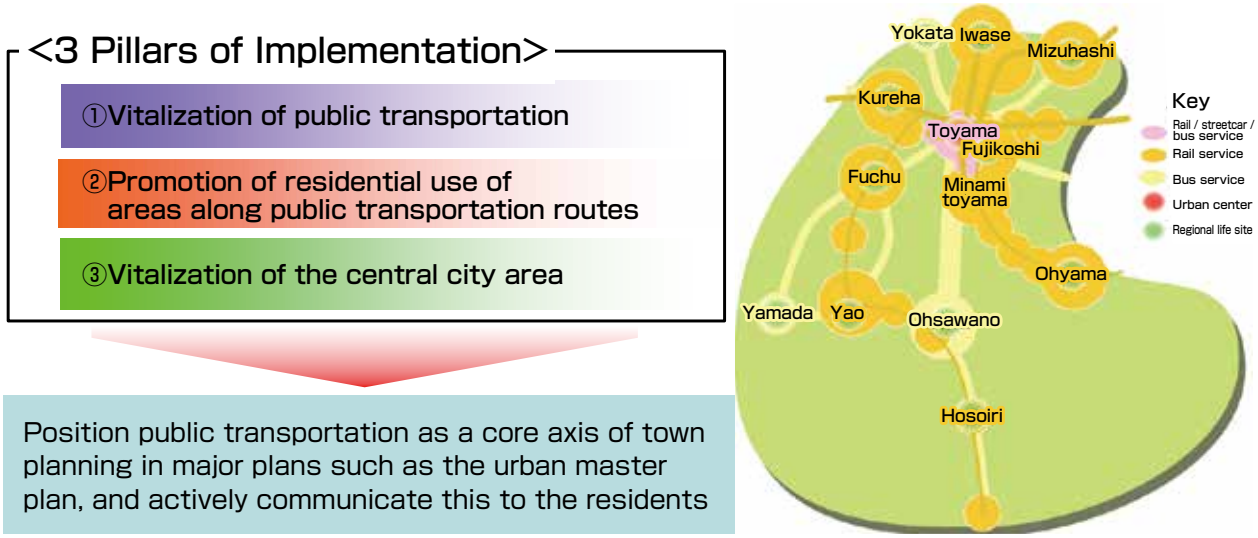
1. Implement BRT for central bus routes to reorganize bus routes
2. Flexibly select routes when implementing BRT, taking demand and road maintenance conditions into consideration
3. Fully leverage the features of BRT, taking a phased approach to introducing bus lanes, improving bus stops and bus transfer sites, and introducing articulated buses



Source: Gifu City (Tentative Translated by Eco-Mo Foundation)

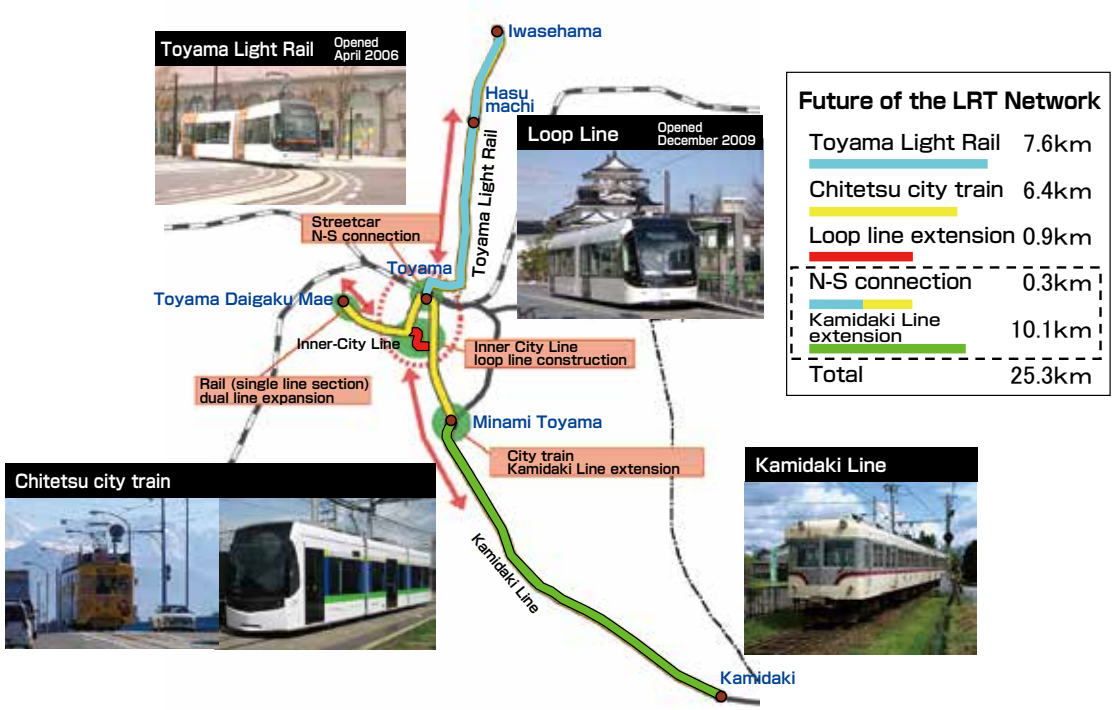
■Toyama City - Low carbon traffic town planning based on Toyama City LRT -

Toyama City has identified population shrinkage, the super-graying of society, excessive dependence on automobiles, hollowing out and stagnation of the central city area, excessive urban management administration costs, and increasing CO2 emissions as challenges the city must face. In order to resolve these problems, it is striving to revitalize public transportation, such as its rail routes, and consolidate residential, commercial, industrial, and cultural city functions along public transportation routes, thereby producing a compact, centralized city with public transportation as its core.



Source: Hokuriku Shinetsu EST Emergence Seminar Toyama City materials (Tentative Translated by Eco-Mo Foundation)

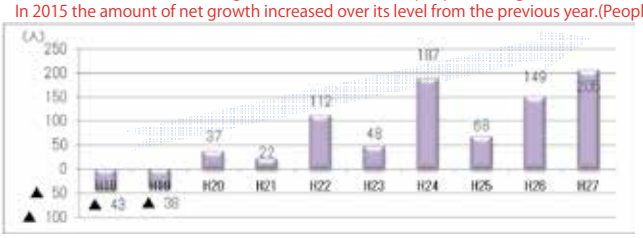
In Toyama City the Toyama Light Rail was opened in 2006, and the city loop line was opened in 2009. The city's creation of the LRT network has contributed to increased rail usage and greater opportunities for elderly residents to venture out of their homes. These efforts are causing people to reexamine lifestyles which depend excessively on automobiles, creating a city which is highly livable for pedestrians.



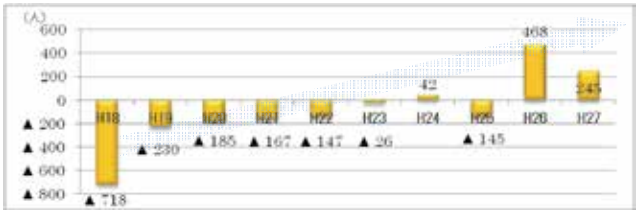
Source: Hokuriku Shinetsu EST Emergence Seminar Toyama City materials (Tentative Translated by Eco-Mo Foundation)

Toyama City is promoting living along public transportation routes, and the share of the city's population choosing to live in midtown districts or public transportation route residential promotion districts is steadily rising.

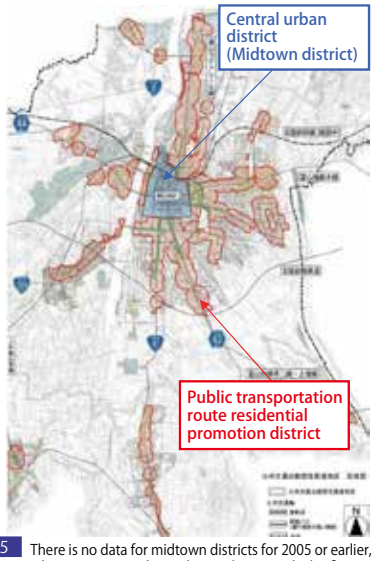
[Social increase in population (moving in - moving out) in the central city area (midtown districts)]
Since 2008 there has been net growth in the number of people moving into central urban districts.
In 2015 the amount of net growth increased over its level from the previous year.(People)



[Social increase in population (moving in - moving out) in public transportation route residential promotion districts]
* There has been net growth since 2012.(People)



[Demographic trends in central city area (midtown districts)]
* The population increased for the first time since 2006, the first year for which figures exist.



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
①Natural dynamic (births - deaths)	▲ 181	▲ 144	▲ 149	▲ 156	▲ 149	▲ 133	▲ 205	▲ 184	▲ 156	▲ 166
②Social dynamic (moving in - moving out)	▲ 43	▲ 38	37	22	112	48	187	68	149	205
③Population dynamic(① + ②)	▲224	▲182	▲112	▲134	▲37	▲85	▲18	▲116	▲7	39

There is no data for midtown districts for 2005 or earlier, so when comparing the midtown district with the five areas which make up the central district (Sogawa, Atago, Yasunoya, Hachininmachi, and Gobancho), which largely overlap with the midtown district, the population of the central five areas has been declining since its peak in 1959. Based on this, it is estimated that the population of the midtown district increased for the first time in 56 years.

Source: Toyama City (Tentative Translated by Eco-Mo Foundation)

Furthermore, in conjunction with the opening of the Hokuriku Shinkansen train line between Nagano and Kanazawa on March 14, 2015, facilities have been improved in the Toyama Station area. For example, a streetcar stop has been built underneath the Toyama Station overpass, improving ease of transfers to Shinkansen lines, rail lines, busses, and the like.

Source: Toyama City website

(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.

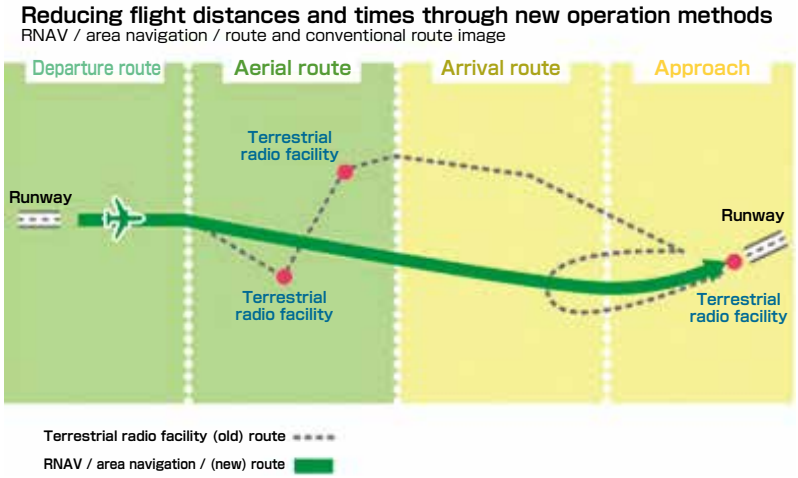
○Global warming prevention targets:

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

CO2 emission basic units: 0.00095t-CO2/RTK (revenue ton kilometers)

Contents of measures:

- Introduce new high fuel efficiency airplanes
- Using area navigation etc, a high-precision navigation method, to reduce flight distances and times
- Select optimal flight altitudes, speeds, and routes which require the least amount of fuel by factoring in meteorological conditions and air traffic control
- 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
- Prioritize use of ground power units with low CO2 emissions for electricity, air conditioning, and engine startup when parked at airports



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

○Support for the creation of a recycling-oriented society

Target: Lower industrial waste final disposal rate to 3.6% or below for 2015

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

○Environmental awareness raising activities

- Close window shades when parked to prevent temperatures inside airplanes from rising (make in-flight announcements requesting that passengers lower the window shades when leaving the plane, reducing the amount by which the interior of the airplane warms up while the airplane is parked, shortening air conditioner usage times and thereby reducing CO2 emissions)
- Offer eco-tours, teaching tour participants about the environment

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 base units in 2020 by 5.7% in comparison to 2010

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

Contents of primary measures:

○Introduction of energy saving cars

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

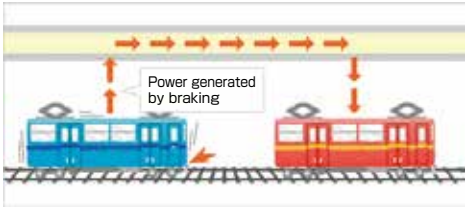
●Rates of introduction of energy saving cars by 16 major private rail companies (as of March 31, 2015)

	Control method	No. of cars owned	
			Number of reduced weight cars
Cars with regenerative brakes	VVVF control	10,786 trains*	9,567 trains
	Chopper control	2,897 trains*	1,525 trains
	Resistance control, other	627 trains*	234 trains
Cars without regenerative brakes	Resistance control, other	2,807 trains	330 trains*
Total number of cars owned		17,117 trains (A)	11,656 trains
Number of energy saving cars (trains with regenerative brakes or reduced weight cars)		14,640 trains (B) (total of trains indicated with a *)	
Share of energy saving cars		85.5% (B/A)	

Note 1: As a general rule, only commercially used cars are included (funicular lines and new transportation lines are not included)
Note 2: "Reduced weight cars" are cars made with stainless steel or aluminum.

○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.

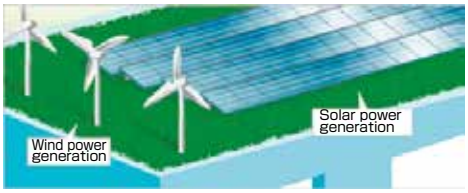


○Noise and vibration reduction

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)

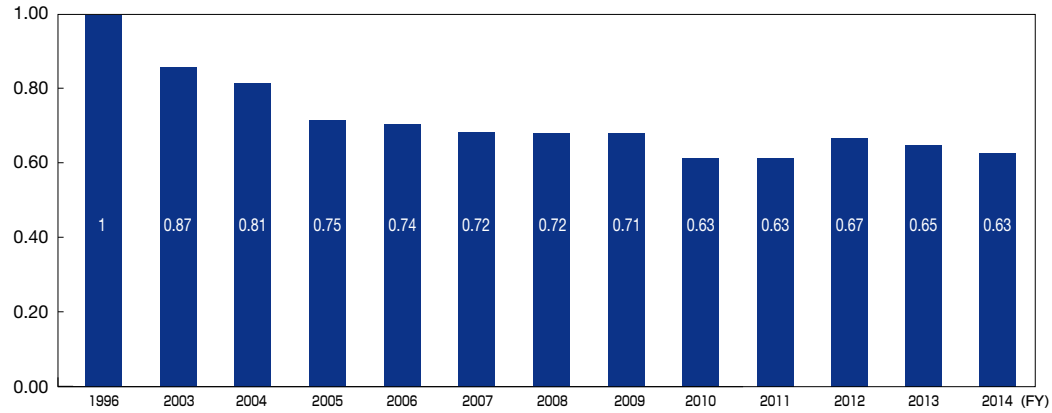
②Truck, bus, and taxi companies

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

Target: Reduce CO2 emission basic units per ton kilometer from commercial trucks in 2020 by 22% in comparison to 2005.

●CO2 emission basic unit index



Source: Japan Trucking Association (Tentative Translated by Eco-Mo Foundation)

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

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

◇Promote drive recorders.

Provide subsidies for the introduction of vehicles with eco-driving management systems and/or drive recorders, which are effective at ensuring eco-driving

◇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 "Commitment to a Low Carbon Society" -

Target:

(1) Cut CO2 emission intensity in 2020 by 6% in comparison to 2010.

(2) Promote shift from use of private vehicles to buses.

Specific activity contents:

(1) CO2 emission rates reduction measures

①Nationwide 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.

②Promotion 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.

③Enforcement of detailed inspections and maintenance which help maintain fuel efficiency performance

The association strives to maintain fuel efficiency performance by establishing voluntary inspection standards, as necessary, for the vehicle components which affect fuel efficiency (tires, air cleaners, air conditioners, etc.).

(2) Measures for promoting shifting from use of private vehicles to buses

①Bus 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
- Popularization of environmental bus passes, etc.
- Active participation in regional measures such as Park & Bus Ride and omnibus town systems
- Deployment and expansion of high grade bus stops, legible bus route information, etc.

②Driving environment improvement

- Issuing of requests to related organizations whenever possible regarding the creation of bus-only and bus-priority lanes, bus-prioritizing traffic signals, the removal of illegally parked vehicles in streets used by buses, etc.
- Utilization of various subsidization systems to deploy and improve systems for improving bus driving environments through the use of ITS such as PTPS.

The Nihon Bus Association gathers information and considers various potential measures, led by its "Environmental Measure Council", which promotes the implementation plan described above.

The association also issues requests to the MLIT, NPA, and other related government agencies regarding the further enrichment of subsidy systems, tax systems, and the like, and improvements to driving environments, etc..

■Measures by companies: Hankyu Bus Co., Ltd.

Hankyu Bus Co., Ltd., an urban transportation company which is part of the Hankyu Hanshin Holdings group, operates route buses primarily in Osaka Prefecture, as well as in Hyogo Prefecture and Kyoto Prefecture, and operates 14 long-distance highway bus routes. Hankyu Bus drives a combined total of 120,000km every day. Because of this, the company was an early implementer of environmental management. It has worked together with communities, engaging in the following environmental activities, such as reusing used cooking oil collected from community residents as biodiesel fuel.

<Measures for achieving regulatory compliance and improving environmental mindset>

As environmental problems have come to be recognized as issues affecting all of humanity, in 1999 the company formulated its corporate philosophy, "People and Community-Friendly Hankyu Bus," positioning the company's environmental efforts as the foundation of its corporate activities.

In 2007 the company formulated an "Environmental Declaration," conveying its environmental activities to the general public. The promotion of green management certification was defined as a measure embodying the regulatory compliance and environmental mentality improvements of the declaration. Six branches have achieved certification, beginning with the Toyonaka Branch in 2005.

Environmental Declaration

This Environmental Declaration is our vow to improve the environmental mentality of each and every employee, and to engage in activities to help protect the environment for the future of our planet.

- We will comply with all environmental laws and strive to improve our environmental mentality.
- We will thoroughly implement eco-driving and promote resource conservation activities.
- We will actively introduce environmentally friendly busses.
- We will promote the use of public transportation.

(Formulated October 2007)

This year the Toyonaka Branch was awarded as a permanently registered branch, due to its 10 consecutive years of registration renewal. Hankyu Kanko Bus and Osaka Airport Transport, members of the Hankyu Hanshin Holdings group, have also received certification. The entire group is working together as one to implement green management.

<Safety and environmental education using training vehicles>

In addition to the environment, another of the company's critical themes is improving safety mindset. Safe driving and eco-driving are closely linked, so safe driving training vehicles are used as part of the core of the company's training and driver education. The training vehicles, made from modified omnibuses, have measuring cylinders which make it possible to visually assess fuel levels and immediately grasp how much fuel is used. Fuel levels drop notably when rapidly accelerating or driving roughly. Conversely, very little fuel is used when coasting. Showing drivers how much fuel is consumed gives them a more immediate grasp of fuel waste than looking at fuel figures alone. The introduction of this education has created a sense of competition, leading drivers to engage in eco-driving and to strive to produce the best fuel conservation results they can. These training vehicles use "Tru-Sam" systems, which record fuel usage, vehicle speed, engine speed, and vehicle body shake. Visual confirmation is combined with analysis of this data to improve driving skills from both directions.

On-site training is used to polish eco-driving skills, and lectures communicate the benefits of eco-driving, focusing on how to best contribute to protecting the environment. There are also extensive discussion of the cost benefits of eco-driving in order further bring home the importance of eco-driving.

<Holding of eco-driving contests>

Since FY2008 there have been eco-driving contests among company branches. The company is working as one to reduce CO2 emissions and fuel costs, and to achieve safer, more comfortable driving. Eco-driving contests are held in June, Hankyu Hanshin Holdings' Environmental Conservation Month, and July, Nihon Bus Association's Eco-Driving Promotion Month. Fuel efficiencies for individual branches are calculated, and the branches with the greatest improvement rates are awarded. Specifically, average fuel efficiency values are calculated for the period from the start of the contest to the same time during the last fiscal year, and the three companies with the greatest improvement rates are selected as winners. Branches which have risen significantly in the rankings over the previous year and branches with particularly notable eco-driving initiatives over the past six months are also awarded. Approaches such as these improve worksite motivation.

<Fuel efficiency trends and issues coming to light>

As the result of these efforts, fuel efficiency has been improved by approximately 4% in the four years since the initiative was launched. However, fuel efficiency has fallen in the last two years. This is due to the increase in air conditioner usage rates to handle hot weather, and the increase in vehicles requiring forced soot-burning idling capabilities. Issues which the initiative will have to face in the future include how to fairly judge drivers, given these unavoidable business circumstances, without creating dissatisfaction, and what kinds of measures to implement in order to further improve fuel efficiency.

<Operating biodiesel vehicles with the cooperation of local residents>

The company is actively deploying environmentally friendly buses such as hybrid buses and buses powered by natural gas. Notable among these are the company's four biodiesel vehicles. Biodiesel is made by adding methanol to waste vegetable cooking oil, using chemical reactions to remove the glycerin.

The resulting fuel is similar in nature to diesel fuel, and because it is made of vegetable oil it counts as having zero CO2 emissions under global warming prevention accords (carbon neutral). The exhaust gas emission it produces contains almost no sulfur oxide and extremely little black smoke. It is legally accepted as a substitute for diesel fuel, and can be used in commercial diesel vehicles, boasting fuel efficiency and driving performance equivalent to that offered by diesel fuel. The company collects waste oil from the condominiums operated by Group companies, Group hotels, and also from local governments and the general public, using the waste oil to create biodiesel. In FY2014 a total of 78,000 liters of waste oil were collected, and approximately 40,000 liters were used. This reduced CO2 emissions by 103 tons.

<Increasing public transportation usage through the introduction of various fares and services>

In order to improve local environments and help mitigate traffic congestion, the company has implemented a system for reducing the use of personally owned vehicles. IC card systems have been introduced in all vehicles to improve buses convenience. An eco-pass system has also been introduced, with family members paying just 100 yen when travelling with people with bus passes. Since June 2014 IC commuter and student passes have also been introduced, and a new service was launched allowing customers to travel as much as they wished within designated fare segments. From February 2016 a new service was launched, enabling mutual use of IC bus passes with Hanshin Bus Co., Ltd. buses as well. Fares and systems such as these have been introduced in order to promote bus usage by local residents.

Hankyu Bus considers compassion to lie at the heart of its bus business. Each and every employee carries out their duties with a sense of consideration for people and communities, embodying compassion for customers, society, and the global environment, and contributing to the enrichement of peoples lives.

■Japan Federation of Hire-Taxi Associations

- Hire-taxi industry "Commitment to a Low Carbon Society" (voluntary action plan) -

Target level:

○2020 target (total volume of emissions target)

Reduce CO2 emissions by 20% in comparison to 2010.

○2030 target (total volume of emissions target)

Reduce CO2 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. CO2 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. CO2 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 Transportation Business in Specific Regions", 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 vehicle 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 vehicles 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 passengers.

・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 taking rests, naps, and when 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 sumer 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 CO2 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 recycle resources.

・ELVs 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 operators

The Japan Association of Refrigerated Warehouses is continuing its efforts to reduce CO2 emissions and energy usage in 2015 as well, through measures such as: ① promoting the introduction of energy saving devices through active use of the assistance project for energy usage rationalization operators (subsidizing 1/3 of project costs) and the popularization promotion project for energy saving natural cooling devices using advanced technologies (subsidizing 1/2 of project costs), ② carrying out energy usage fact-finding studies and coolant studies to collect basic data related to CO2 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 personal vehicles has resulted in chronic traffic congestion and the waning of public transportation. In order to create a shift from the use of private cars to public transportation, citizens' organizations are creating and publishing bus maps and other materials.

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, sharing the map creation expertise of citizens, not transport operators or administrative authorities, and engaging in passionate discussions about the future of public transportation.

●List of bus maps

Region	Name	Bus Map, etc.
Sapporo	Yourun	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 Transportation Research Society	Niigata City Transportation Map
Fukui	ROBA (Railway, Omnibus, Bicycle & wAlk machizukuri association)	Fukui Norinori Map BUS-DENSYA-NET FUKUI
3 Tokai Prefectures (Aichi, Gifu, Mie)	Public Transportation Usage Promotion Network	Rosenzu.com Gifu City Bus Map, etc.
Wakayama	Wakayama City Planning Council - Wakayama Komachi	wap
Matsue	Project UI	Doko Demo Bus Net Doko Demo Bus Book Doko Demo Bus Map Sugoroku
Okayama	Rail transport system Amenity Community Design Association (RACDA)	Bokke Convenient Bus Map Nonbe Convenient Map
Hiroshima	Hiroshima BRT Research Society	Bus Supermap
Takamatsu	Grutto Takamatsu Public Transportation Development Group	Ittenmai Takamatsu City Bus Map
Okinawa	Bus Map Okinawa	Bus Map Okinawa

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

Every year over 200 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 transportation 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 transportation event. In 2015 10 cities in Japan participated. (Sendai City, Saitama City, Yokohama City, Matsumoto City, Fukui City, Toyohashi City, Osaka City, Kyoto City, Takamatsu City, Naha City)

During Mobility Week & Car-Free Day 2015, Car-Free Day Japan selected and announced winners of awards such as the Town Planning Contribution Award, Event Project Award, and Citizens' Appeal Award as part of the "Mobility Week & Car-Free Day Japan Awards 2015" (chief judge: University of Tokyo Professor Emeritus Katsutoshi Ohta) in order to provide city residents with opportunities to consider mobility related problems and to contribute to the development of new urban transportation policies.

●2015 Mobility Week & Car-Free Day Japan Awards main award results

Award	Recipient
Town Planning Contribution Award	Matsumoto City No Private Vehicle Day Promotion Residents' Council
Event Project Award	Saitama Car-Free Day Planning Committee
Citizens' Appeal Award	Kyoto Car-Free Day Planning Committee

(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 industries in July 2005. As of the end of 2015 there are 3,669 certified businesses and 7,234 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 12.4% and 16.5% of the vehicles owned by companies within 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, 2014	Companies Nationwide	Percentage Owned by Certified Companies	Notes
Trucks	151,413	1,224,608 (Note 1)	12.4%	(Note 1): Number of vehicles owned as of the end of March 2014. This includes the number of commercial trucks (excluding trailers) and the number of commercial special purpose vehicles as indicated in the "Transportation Statistics Collection" (from the MLIT). It does not include the number of registered light trucks.
Buses	17,692	107,241 (Note 2)	16.5%	(Note 2): Number of vehicles owned as of the end of March 2014. Based on the "Transportation Statistics Collection" (MLIT).
Taxis	33,170	203,943 (Note 3)	16.3%	(Note 3): Number of corporate taxis owned as of the end of March 2013. 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.

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

One of the energy saving measures required of cargo owners under the Energy Saving Act (enacted in April 2006) is the selection of environmentally-friendly cargo carriers (carriers who have obtained ISO14001 or green management certifications).

○Addition of transportation 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【transportation 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.

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

○Express inclusion in the "Community Bus Deployment Guidelines" as specified in the notice regarding the revision of the Road Transportation Act

【Notice: MLIT Notice 633, April 10, 2013 "Concerning the Approach of the MLIT to Regional Public Transportation 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.

○Express inclusion in the "Guidelines for the Selection and Use of Chartered Buses in Order to Ensure Transportation 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".

○Relaxation requirements for natural gas vehicle and hybrid vehicle 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 green management certification.

○Certification acquisition subsidy systems

Local governments:

10 organizations (Chuo-ku, Tokyo; Katsushika-ku, Tokyo; Sumida-ku, Tokyo; Shinjuku-ku, Tokyo; Matsudo City, Chiba Prefecture; Yokohama City, Kanagawa Prefecture; Shiojiri City, Nagano Prefecture; Ina City, Nagano Prefecture; Kameyama City, Mie Prefecture; Fukuyama City, Hiroshima Prefecture)

Industry groups:

Japan Association of Refrigerated Warehouses and 38 prefectural Trucking Association (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, Ehime Prefecture, Kochi Prefecture, Fukuoka Prefecture, Nagasaki Prefecture, Kumamoto Prefecture, Oita Prefecture, Miyazaki Prefecture, Kagoshima Prefecture)

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

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

The Conference on Promotion of Public Transportation, 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 2015 647 business sites have been certified.

Certified business sites implementing Best measures may also be recommended for MLIT awards. In 2015 Toyota City and Toyooka City was selected as the winner of the "2015Minister's Award for Excellent Business Implementing Traffic-Related Environmental Conservation Efforts"

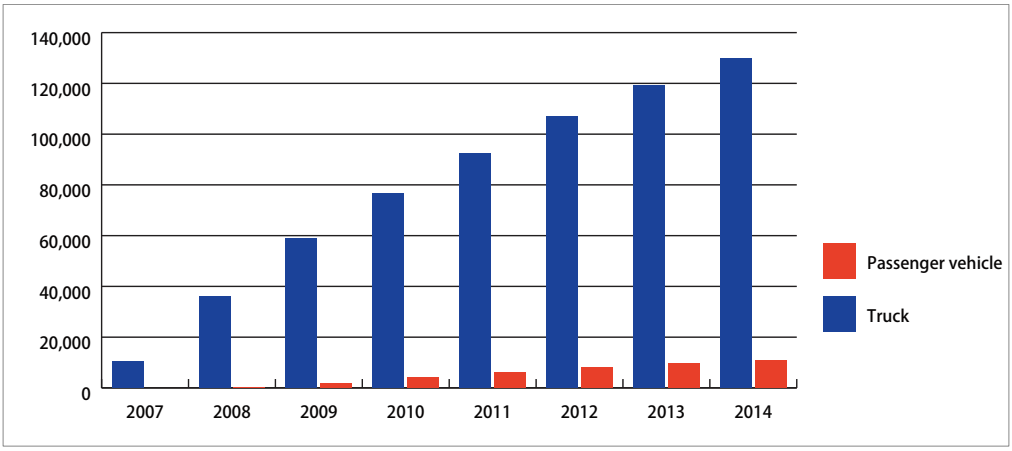
●Measures implemented by Toyota City, Aichi Prefecture and Toyooka City Hyougo Prefecture

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 from September 2008, and presents students 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 (transportation 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 "2015 Eco-Drive Symposium" on November 17.

●Accumulated number of completed certificates issued



●2015 Eco-Drive Activity Contest award ceremony

●Contest leaflet

④Promotion of Environmentally Sustainable Transport (EST)

The OECD has proposed Environmentally Sustainable Transport (EST) (see page 41), and organizations such as Japan's MLIT have implemented EST model projects. In order to achieve greater use of EST by local governments and transport operators, since 2006 the Eco-Mo Foundation has worked with academic experts, related groups, EST related ministries and agencies, and other organizations to promote EST.

In 2015 the Eco-Mo Foundation collaborated with the Regional Transport Bureau in holding workshops for local governments and transport operators (EST Emergence Seminars) in Sapporo City, Toyohashi City, and Sakai City. In addition to these workshops, tours and review sessions were also held as part of a three day personnel development training session (the 5th such session) in Fujisawa City. The 7th EST transport Environment Awards, recognizing exceptional regional transport environment efforts, were also held. In 2015 Sendai City received the MLIT Award, and Nankai Electric Railway received the MOE Award. The awards ceremony was held as a part of the 9th EST Promotion Forum, a symposium, in Tokyo, and the awards were also publicized on the EST portal site (http://www.estfukyu.jp/), email newsletters, and Twitter (https://twitter.com/#!/officeEST).

●7th EST Traffic Environment Award results

Award	Recipient	Name of Main Project
Grand Prize	**[Minister of Land, Infrastructure, Transport and Tourism Award]** ○Sendai City	Public Transportation Promotion Initiatives aimed at reduction of environmental impact in Sendai City
Grand Prize	**[Minister of the Environment Award]** ○Nankai Electric Railway Co., Ltd.	Nankai Electric Railway Medium-Term Environmental Targets
Outstanding Performance Award	○Keisei Bus Co., Ltd.	Keisei Bus' "3S Movement"
Incentive Award	○Hadano City	Hadano transportation streamlining initiative
Incentive Award	○Ise City, which is utilizing electric vehicles, etc. Low Carbon Society Creation Council	Okagesama Action! - For residents and visitors -

●Award-winners Sendai Subway Tozai Line and Nankai Electric Railway 8300 series train

⑤Promotion of mobility management education (transport environment education)

In order to promote transport environment 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.

Since 2015 educational support has been offered to the local governments of Kyoto City, Kyoto Prfecture. Support was provided to three groups, including Obihiro City and Fujisawa City, which have been provided support since 2014.

<Measures by supported local governments>

Obihiro City:

Alongside the workshops provided in the past, new programs tied to coursework and easy for educators to implement were considered and developed.

Fujisawa City:

In addition to the two year educational programs for 5th and 6th graders considered in 2014, short-term programs were also considered and implemented.

Kyoto City:

Alongside the unique city programs which were developed, new programs tied to coursework and easy for educators to implement were considered and developed.

Fujisawa City

Kyoto City

In 2015 support has also been provided to the following three elementary schools.

●Names of supported schools and educational themes

Name of School	Theme	Subject	Hours	Student Grade
Matsushima Elementary School, Naha City, Okinawa Prefecture	Let's learn about the allure of "Yui Rail," the monorail we all know and love	Social Studies	3 classes	4th graders
Kanazawa University Affiliated Scool for Special Needs Education	Interchange between special needs school and industrial high school, and joint education regarding public traffic environment in communities with children with intellectual disabilities		10 classes	3rd to 6th graders
Midoridai Elementary School, Kawanishi City, Hyogo Prefecture	Our Kawanishi (examination of public transportation, the environment, and transportation town planning)	Life Environment studies	3 classes	2nd graders

⑥Eco-Products 2015 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.

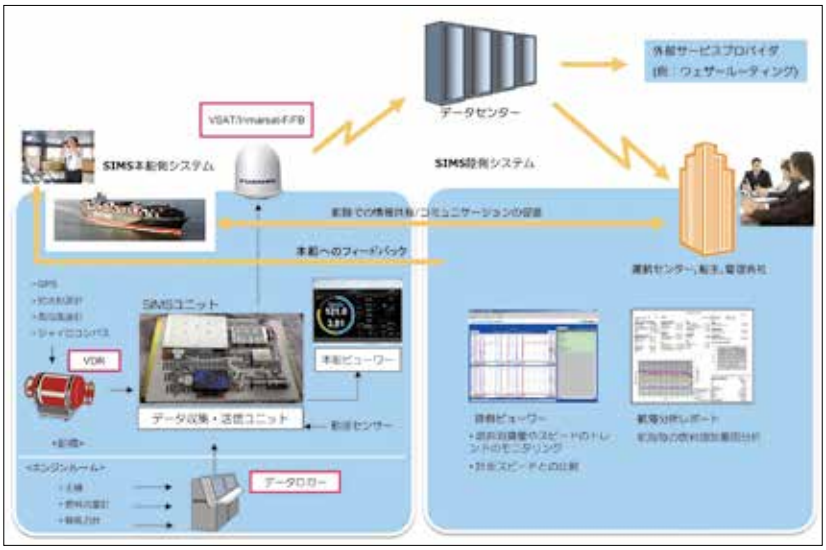
(Eco-Products 2015 data: Exhibitors: 702 companies and organizations. Visitors: Approx. 170,000. Eco-Mo Foundation booth visitors: Approx. 4,000)

⑦12th Eco-Products Awards

The Eco-Products Awards are held by the Eco-Products Awards Promotion Council (consist of Global Environmental Forum, Japan Environmental Management Association for Industry, Eco-Mo Foundation, and Japan Organics Recycling Association). It was established in order to encourage the spread of eco-friendly products by awarding excellent products and services reduced environmental load.

In 2015 NYK .etc won the product category Minister of Land, Infrastructure, Transport and Tourism Award for its Ship Information Management System(SIMS). The winners were presented with their awards at the Eco-Products 2015 Exhibition, held in December.

●12th Minister of Land, Infrastructure, Transport and Tourism Award Ship Information Management System(SIMS)



⑧Promotion of usage of carbon offsets in the transportation 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 and transportation 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 transportation and tourism sector, in December 2009 the Eco-Mo Foundation established the "Transportation 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 CO2 emissions and purchase emissions rights via the web. The system is already being used by local government transportation 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 CO2 emissions for the base fare distance (2km) of each taxi trip departing from the taxi stand was offset by the company

Taxi stand

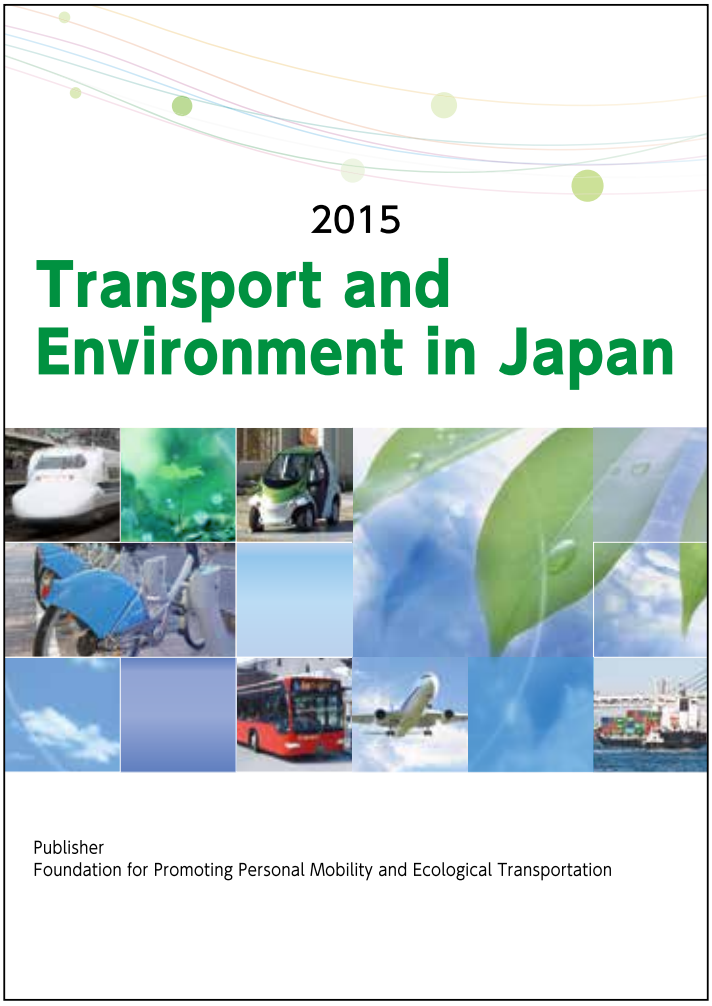
Leaflet

⑨Publication 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 and transportation sector (global warming, air pollution, waste, recycling, marine 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 traffic environment measures and countermeasures overseas.

(The English version can be downloaded from the Eco-Mo Foundation website.)

●Transport and Environment in Japan 2015



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 2013 found that of the 7,209,000 homes studied, 514,000 (7%) 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. 253,000 of the homes (4%) exceeded environmental noise standards both during the day and at night.

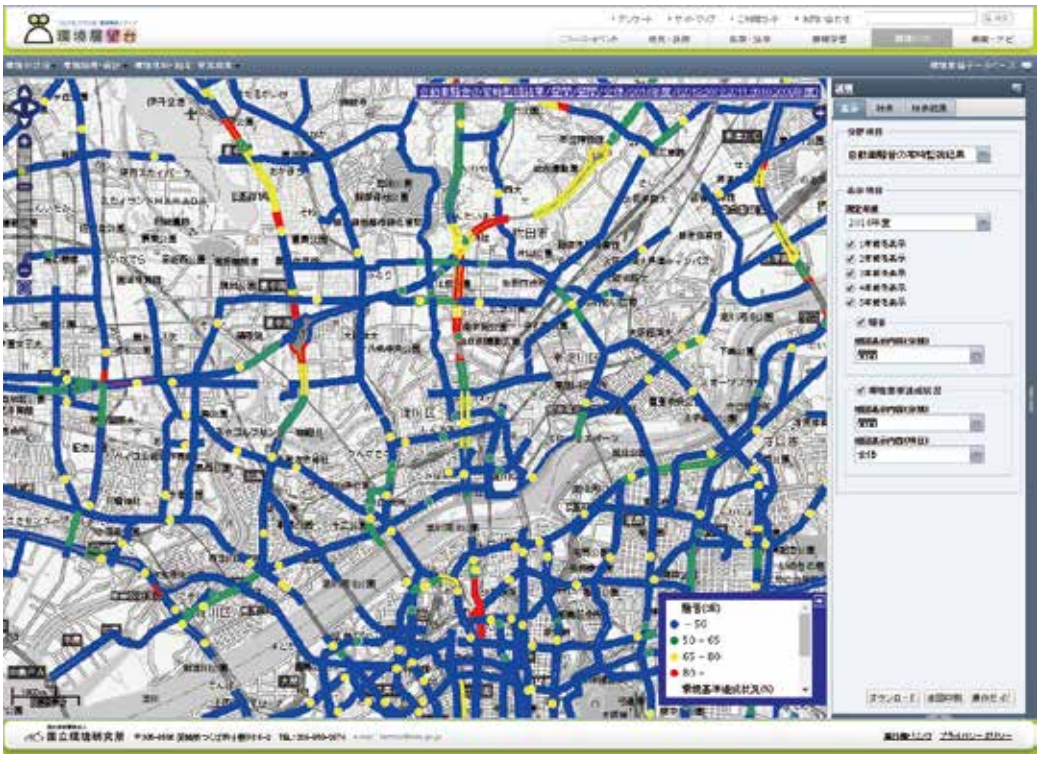
Of the 3,033,000 homes in areas along major arterial road, 358,000 (12%) exceeded environmental noise standards during the day, at night, or both. Of those, 173,000 (6%) exceeded environmental noise standards both during the day and at night.

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 65,000 homes located in these areas, 8,000 homes (12%) exceeded environmental noise standards.

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

With regard to Shinkansen noise, relevant administrative authorities and companies have implemented so-called "75 decibel measures" in order to bring noise levels in dense residential areas along Shinkansen lines to or below environmental noise standards (primarily residential areas: 70 decibels or below, primarily commercial or industrial areas: 75 decibels or below).

Four stages of 75 decibel measures have been implemented. The stage 4 study found that only one of the measurement sites in the areas where the measures were implemented had a noise level which exceeded 75 decibels. Some of the areas where the measures were not implemented still do not meet the 75 decibel standard, so "75 decibel measures" will continue to be implemented in order to achieve environmental noise standards.

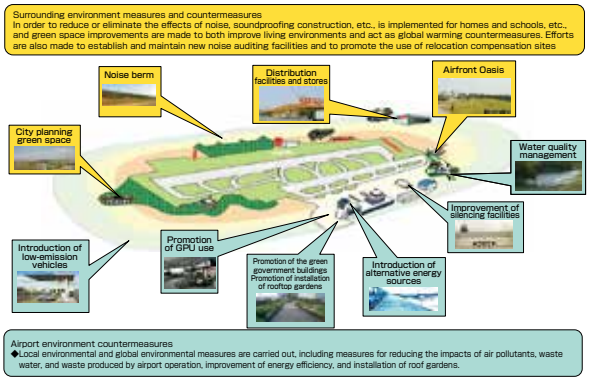
Shinkansen noise countermeasures include raising noise barriers, installing pantograph covers, and re-profiling rails to prevent the actual production of noise. When these measures are insufficient to meet environmental noise standards, subsidies are provided for performing soundproofing on existing houses.

In the case of conventional railway line noise countermeasures, in accordance with the "Noise Countermeasure Guidelines Regarding the New Installation or Large Scale Modification of Conventional Railway Lines", railway operators are instructed to implement measures to ensure that noise levels do not exceed specified values for newly installed lines, and to ensure that noise levels are reduced when performing large scale modification of existing lines.

(3) Airplane noise countermeasures

The most effective measure for reducing airplane noise levels is the introduction of low noise airplanes. When comparing the 80dB(A)(adjusted based on human hearing characteristics) noise levels, the noise impact scope of the current B767 is roughly 90% smaller than that of the previously used DC8. In areas in which noise is still a problem soundproofing, etc. is being constructed on houses. For the most part, this soundproofing work has been completed, except for follow-up maintenance. Improvements are being made in the area of airplane noise, and noise countermeasure areas are being reviewed and readjusted in airports such as Osaka International Airport. Nevertheless, measures for further reducing noise will remain important for achieving harmony between airports and their surrounding areas.

●Eco-airport conceptual diagram



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

In 2003 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

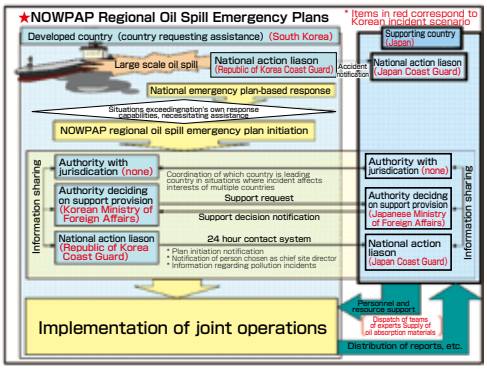
One of the major factors behind the large scale oil spills in recent years is the existence of ships which do not meet the standards set forth in marine safety and sea environmental conservation treaties (sub-standard ships). In order to eliminate these ships, Japan is participating in international 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.

Japan maintains three large dredging and oil recovery ships to quickly reach and clean up oil spills in the seas around Japan. Furthermore, Japan, China, the Republic of Korea, and Russia have established a collaborative rapid response system for cleaning up large spills of oil or hazardous substances in the Sea of Japan, the Sakhalin area, and the Sea of Okhotsk. The system of international collaboration and coordination is being strengthened through the "Action Plan for the Protection, Management and Development of the Marine and Coastal Environment of the Northwest Pacific Region (NOWPAP) Regional Oil and Hazardous and Noxious Substances (HNS) Spill Contingency Plan" (2008).

● 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)



Source: Japan Coast Guard (Tentative Translated by Eco-Mo Foundation)

(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

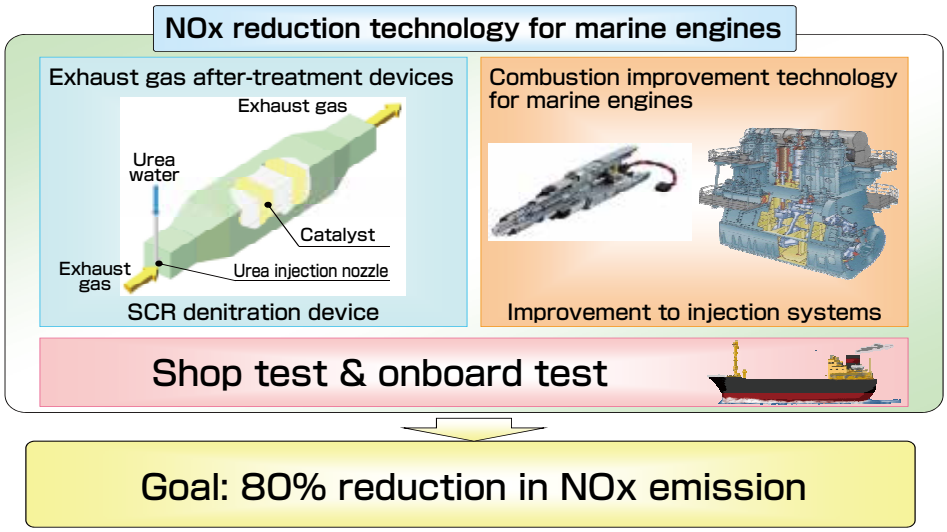
Ships offer superior energy consumption efficiency, but they account for a large share of Japan's total nitrogen oxide (NOx) emissions. In order to respond to this problem and maintain compliance with regulations stipulated in international marine pollution prevention conventions Japan is developing technologies for use in ship emissions gas aftertreatment devices capable of significantly reducing the amount of NOx in exhaust gas, and researching and developing environmentally friendly diesel engines for ships, including methods for improving the combustion of engines themselves. For example, the compact high speed auxiliary engine SCR denitrification device, an aftertreatment device whose development began in 2007, was installed in a bulk carrier (95,000D/W) in 2010 and has successfully reduced NOx emissions. In March 2011 pilot testing began using an actual ship in order to meet NOx Tier 3 regulations (80% reduction from Tier 1) which the IMO plans to put into effect from 2016. A ship SCR denitrification device was installed in the main engine (1,491kW output) of an in-service cargo ship, and as a result the ship has achieved conformance with Tier 3 regulation standards.

Also, to reduce the amount of emissions of gasses such as CO2, NOx, and SOx from berthing ships, efforts are also underway to have ships shut down their engines while berthed and use electrical power supplied from the land instead of power generated onboard the ship.

Furthermore, development is underway of an index (a 10 mode index for ships) for evaluating energy saving performance during the design phase of ship construction, with the aim of promoting the development and use of high fuel efficiency ships. Some of the results of this development have been used since July 2009 by the Nippon Kaiji Kyokai to provide environmental performance appraisal services for container ships. Expectations are high for the contributions of these services to the development and greater usage of high performance ships.

Ships travel between countries, so ensuring the effectiveness of exhaust gas countermeasures requires the application of regulations arrived at by international consensus. Japan has revised laws such as the Act on Prevention of Marine Pollution and Maritime Disaster in response to revisions to the MARPOL Convention. Since July 2010 restrictions on the emissions of NOx from engines have been strengthened, and based on these new restrictions engine NOx emissions are being confirmed and regular ship inspections are being performed. Japan is also actively participating in IMO discussions on further exhaust gas emission restrictions.

●The development of environmentally friendly marine diesel engines



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

Column

Promoting the turning off of ships' engines when stopped!
- Example in Hokkaido -

The turning off of ship engines when stopped is being promoted to improve the air environment by cutting emissions of gasses such as carbon dioxide (CO2), nitrogen oxide (NOx), and sulfur oxide (Sox) in port areas. Instead of generating power on-board when berthed, ships use power supplied by facilities on land.

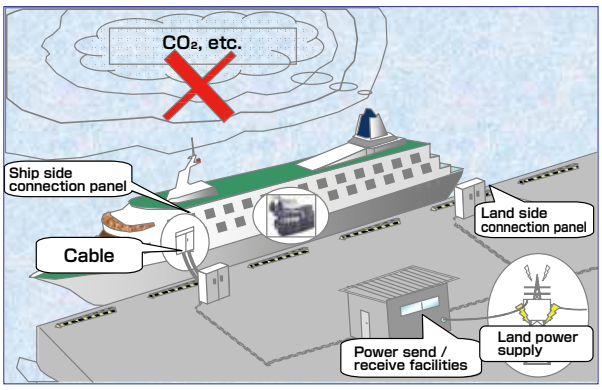
The MLIT has worked together with the MOE on projects such as local power supply pilot tests at sites such as Takeshiba Pier since October 2006, and has confirmed their usability, electrical stability, and safety.

Engine shutdown experiments were carried out in 2009 at five ports across Japan, including Kushiro Port. Based on the results of these experiments, a project aimed at having ships shut down their engines when stopped has been implemented in Kushiro Port (Kushiro City) since May 2010.

This makes it the first public port in Japan to do this. This approach will be gradually extended to other ports in the future.

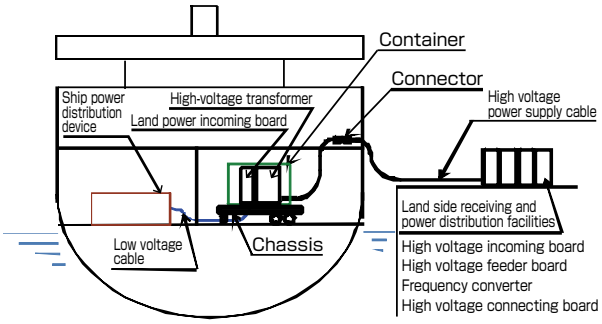
In December 2010 and February 2011 testing was performed at the Tomakomai West Port Ferry Terminal of loading power receiving equipment mounted in containers onto large ferries in cold and snowy areas, making it possible to supply the ferries with power without requiring large scale modifications of the ships themselves. This testing went extremely well, confirming the stability and operability of this approach.

●Ship idling reduction image



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

●Supplying of power to large ferries in snowy and cold regions



Source: The Tomakomaimimpo (Tentative Translated by Eco-Mo Foundation)

●Highly versatile power supplies using chassis
(A chassis containing power incoming boards and transformers is placed in a container (tow trailer), loaded onto the ferry, and installed)

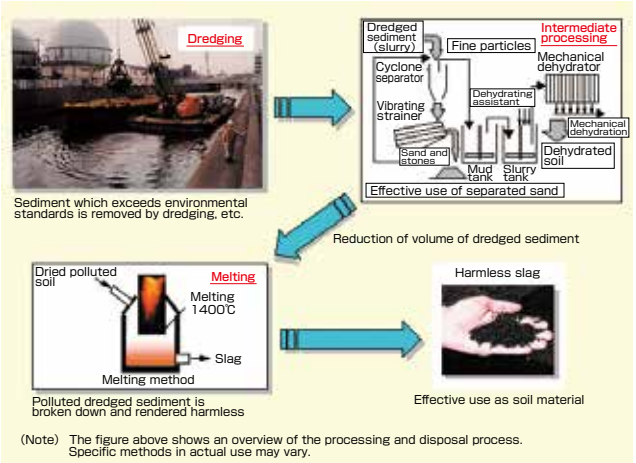
Source: The Tomakomaimimpo

4 Chemical substances countermeasures

(1) Dioxin, etc. countermeasures

Dioxins are produced when garbage and other matter is 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.

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

●Endocrine disruptor website

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

(3) Asbestos countermeasures

●Asbestos countermeasure pamphlet

Source: MLIT

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

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

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

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

●PRTR pamphlet

Source: METI and MOE

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

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

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

5 Ozone layer destruction prevention

The ozone layer which envelops the earth plays an important role in protecting life on 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 for Protection of the Ozone Layer through Regulation of Designated Substances, etc., 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.

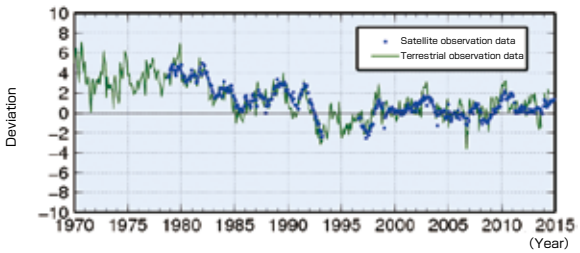
With regard to the recovery of fluorocarbons from vehicle air conditioners and subsequent destruction, due to the fact that vehicle air conditioners are constituent components of automobiles, in January 2005 they were excluded from the scope of the Fluorocarbon Recovery and Destruction Act, and regulated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

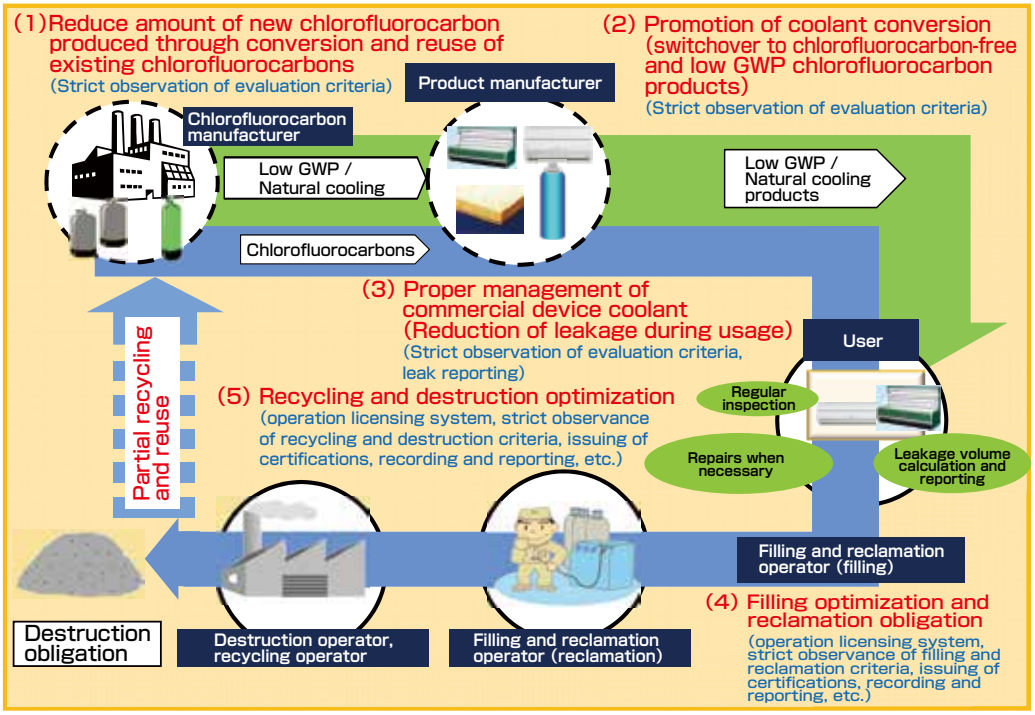
Amount of ozone worldwide

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.



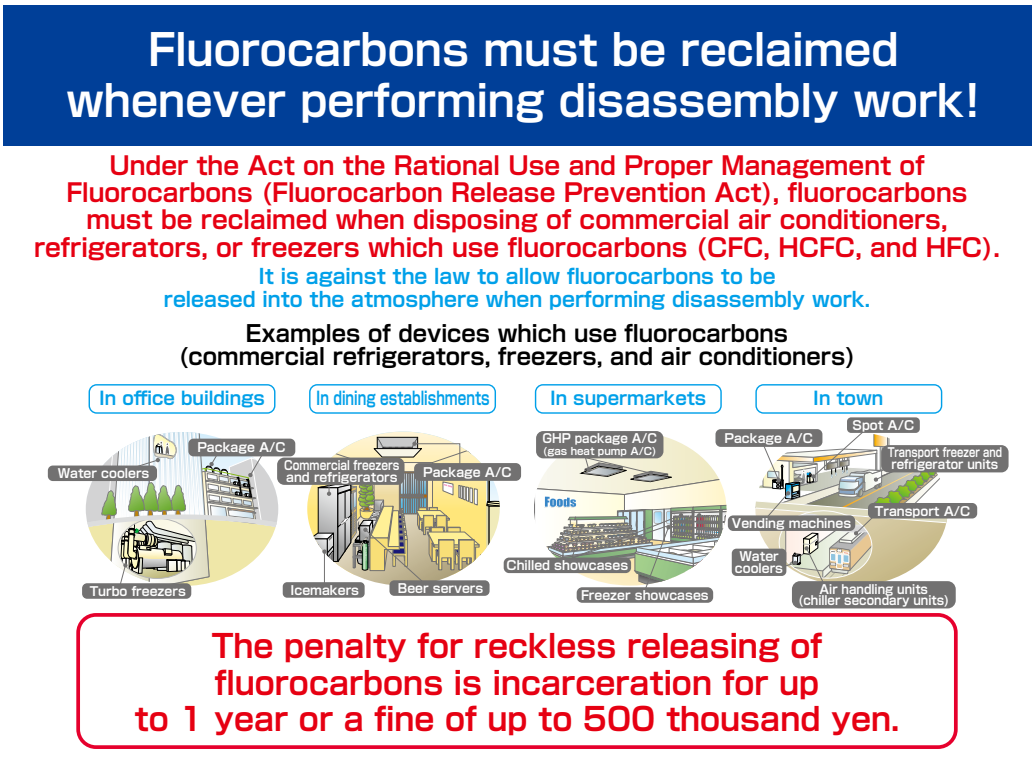
This graph shows the percentage of increase or decrease in the average amount of ozone worldwide compared to the average amount for the 1994 to 2008 period. These value changes have been adjusted to eliminate the influence of seasonal variation. The solid lines indicate data from terrestrial observation 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).

●Overview of the Fluorocarbon Discharge Prevention Act



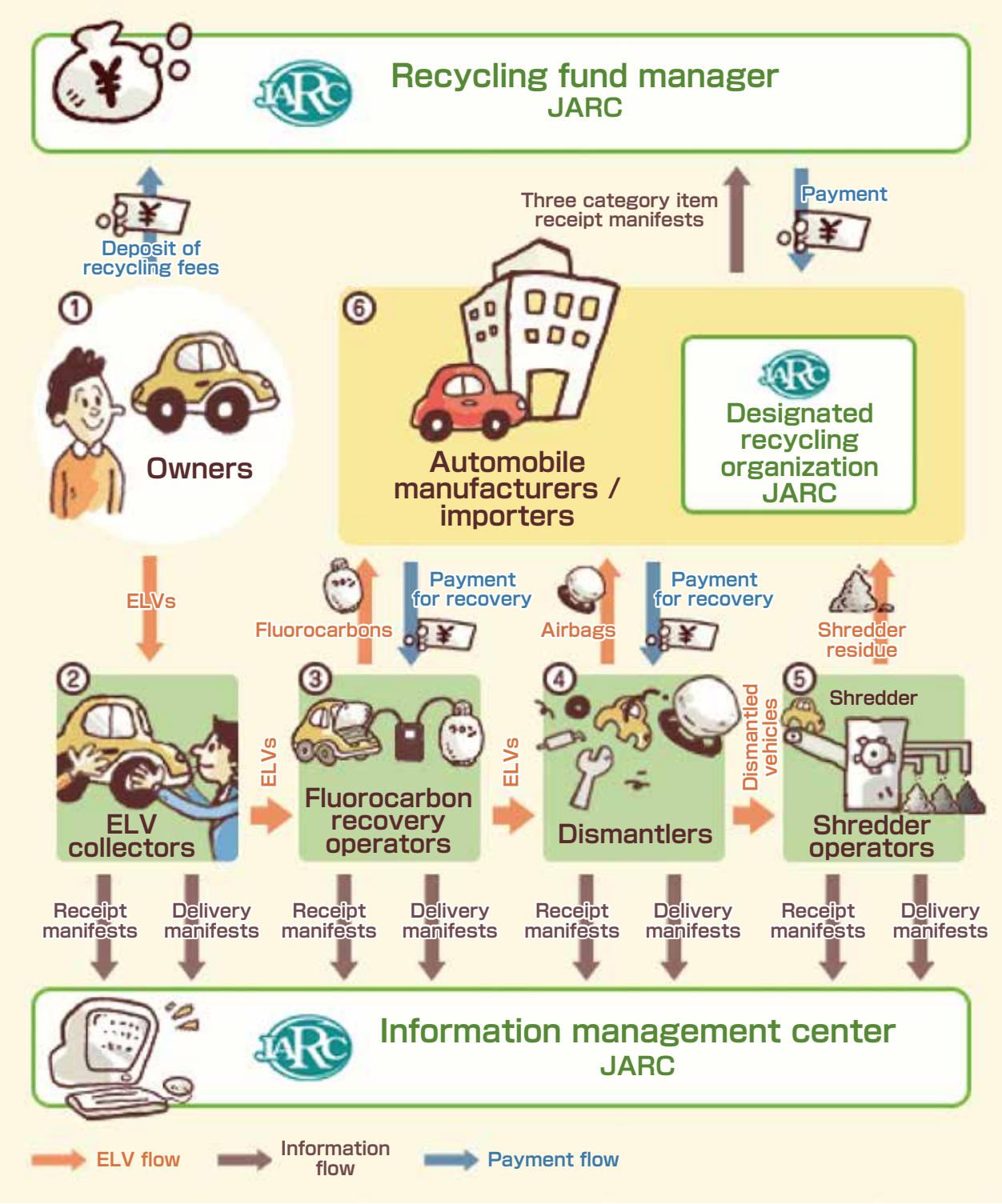
Source: METI and MOE (Tentative Translated by Eco-Mo Foundation)

●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

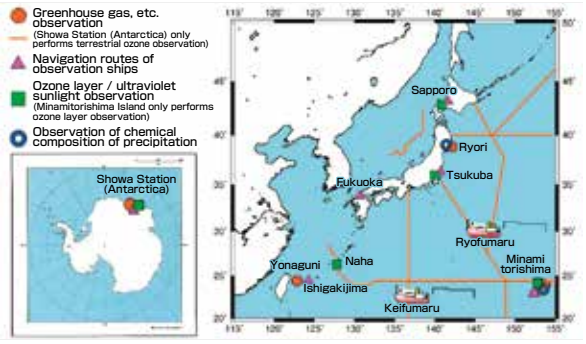
Implementing precise environmental problem countermeasures in the transport sector requires the accurate assessment of air and sea changes through steady, long-term observation and monitoring. Diverse air, sea, and other observation and monitoring are being implemented by global monitoring networks.

(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.

In order to assess greenhouse gas conditions, the amount of CO2 in the atmosphere is being measured at three locations in Japan and the amount of CO2 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.

●Atmospheric environment monitoring network



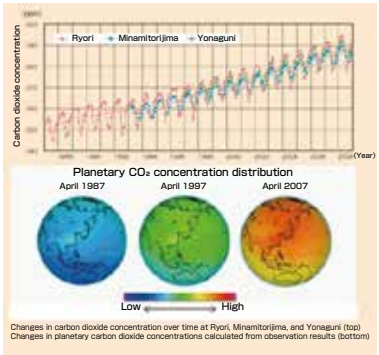
Source: JMA (Tentative Translated by Eco-Mo Foundation)

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)

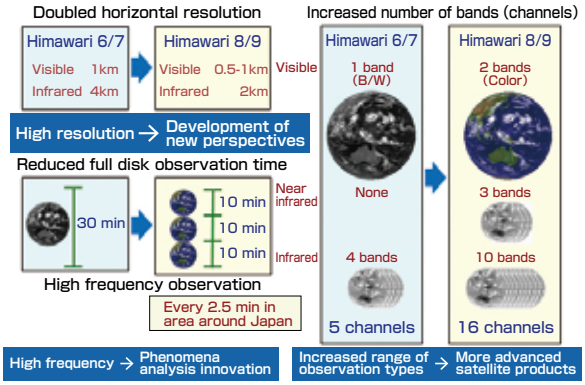
●Climate change monitoring report

Source: JMA

(2) Himawari 8 and 9

Himawari 8 and 9 are the successors to the Himawari 7 (MTSAT-2) satellite, a multipurpose transportation satellite currently in operation. Himawari 8 was launched in October, 7, 2014, and after performing confirmation testing of its functionality while it orbit, full-fledged operation began on July 7, 2015, taking over from Himawari 7. Himawari 9 will be 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

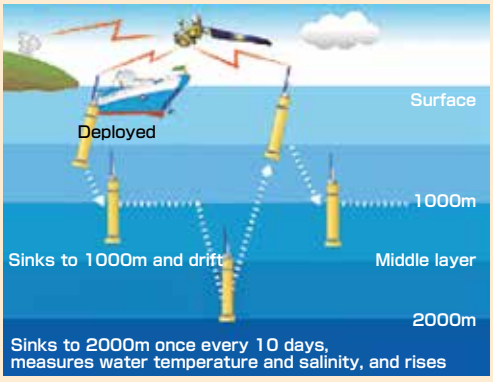


(3) Sea observation and monitoring

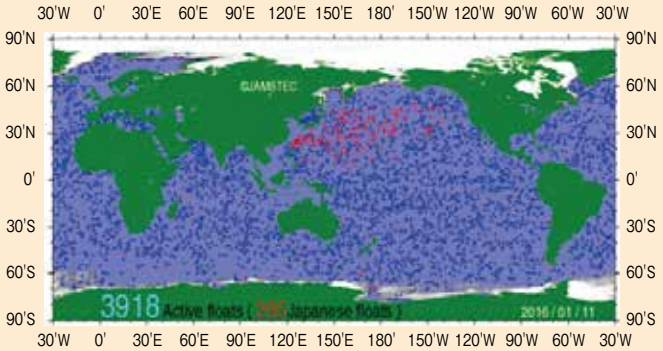
The sea absorbs CO_2, a greenhouse gas, and retains heat, moderating global warming. Sea changes are intrinsically linked to typhoons and anomalous weather conditions, so accurately assessing sea conditions is an important part of responding to global environmental problems.

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 (3,918 floats as of January 1,2016. 205 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)

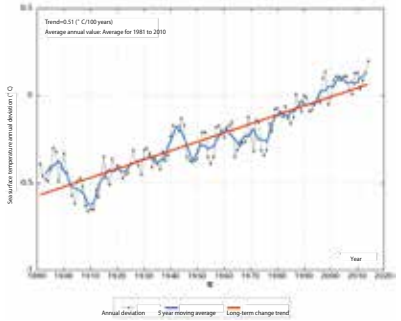
The JMA collects and analyzes data from various sources, such as observation vessels, Argo floats, and satellites, and releases Marine Health Diagnosis Tables, comprehensive diagnoses and future predictions regarding sea change conditions related to the global environment.

The Japan Coast Guard constantly monitors and assesses Japan Current changes in the area around the Izu Islands using marine short-wave radar. It publishes observation data to supplement the data obtained from Argo floats. The 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) anomaly trend

Diagnosis (2014)

•In 2014 the sea surface temperature was 0.20° C higher than the average annual sea surface temperature (global average). This was the highest value since stastical data first began being gathered 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 0.51° C per century. In the early 2000s the amount of change had leveled off, but 2014 reached a new record temperature for the first time in 16 years, since 1998's record high.



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)

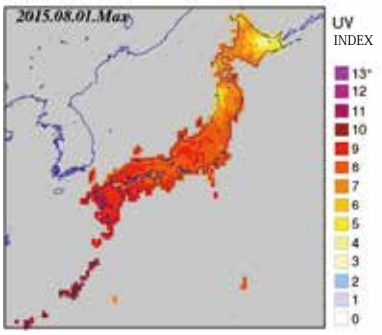
(4) Ozone layer observation and monitoring

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.

(5) Promotion of steady observation at the south pole

The Geospatial Information Authority creates topographical and other maps based on reference point measurements, gravity measurements, continuous GPS observation, exposed 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.

●UV index (peak daily values)



Source: JMA

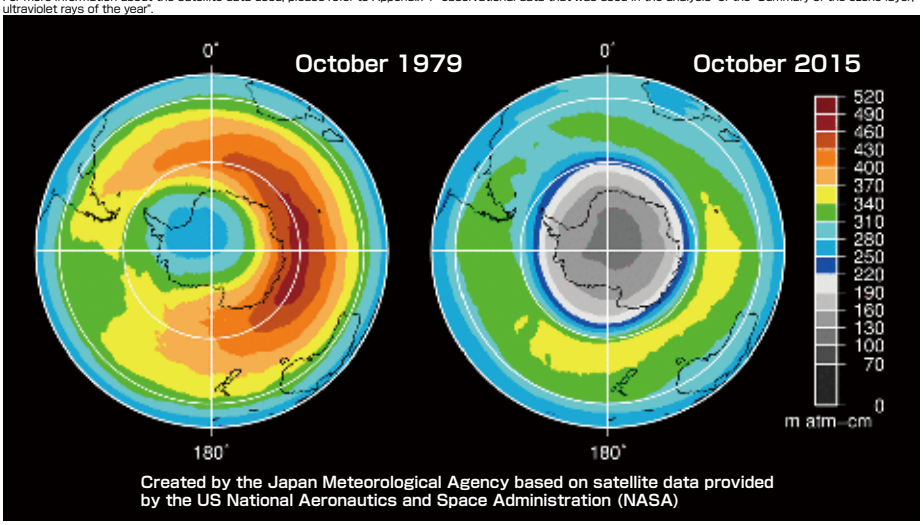
Since 1992 it has, with the collaboration of other countries around the world, compiled a database (global map data) of fundamental global geographical information needed when performing monitoring or analysis of global environmental problems, etc. In 2008 it completed and released the first version of its global map database, which includes land data for the entire world. It has since released the second version of its database, which covers land coverage and woodland coverage rates.

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.

●Changes in the Antarctica ozone hole (1979 to 2015)

Distribution of average ozone levels in October in the southern hemisphere in 1979, before the southern hemisphere ozone hole appeared, and in 2015.
The region with a concentration of 220m atm-cm or less is the ozone hole.
Created by the Japan Meteorological Agency based on satellite data provided by the US National Aeronautics and Space Administration (NASA)
For more information about the satellite data used, please refer to Appendix 1 "observational data that was used in the analysis" of the "Summary of the ozone layer, ultraviolet rays of the year".



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

●World map (woodland coverage layer)

Source: "Global Map Project"
Website Management Committee

●World map

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)
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)
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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