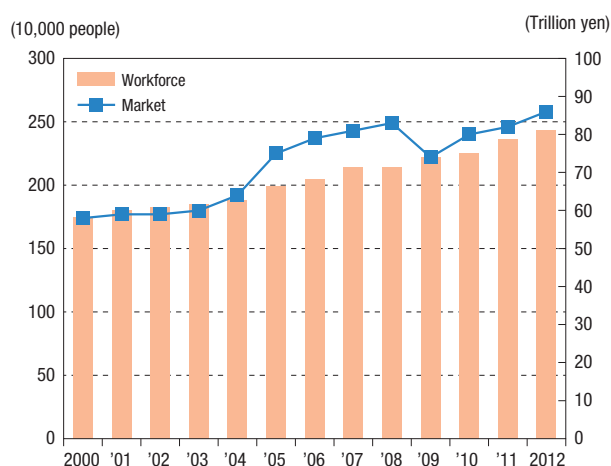


Environmental goods and services industry

In Japan, annual estimates of the market and workforce for environmental goods and services are made with reference to the OECD classification of the environmental goods and services industry. Estimates for 2012 indicate a market of about 86 trillion yen and a workforce of about 2.43 million people, both of which appear to be expanding after recovering from the impact of the global financial crisis in 2008.

Also, surveys of business sentiment at companies engaged in environmental businesses indicate strong confidence both in the present and the future of the industry compared with other industries, and this sector can be expected to see continued growth in the future.

Changes in the market and workforce for environmental goods and services



Note: Estimation of market scale is based on domestic Japanese production volumes for both domestic and foreign markets (based on sales) by Japanese companies serving the environmental goods and services industry. These estimates do not take into account the likelihood of overlap or duplication within the industry.

Source: Ministry of the Environment

Growth of green economy through increased use of environmental technologies

Measures for development and deployment of environmental technologies that promote the growth of the green economy

A great variety of techniques are used in Japan's environmental policies. There is a tendency to view regulation as adding to the cost of economic activities, but in some cases, regulation can actually result in opportunities for increased use of beneficial environmental and energy-saving technologies. For example, rising energy costs and measures to regulate pollution have led Japan to develop some of the world's most advanced environmental and energy-saving technology. The introduction in 1978 of laws regulating automotive emissions were based on criteria that could not be achieved with existing technology, thereby forcibly stimulating

technological development and providing a competitive edge to whichever company in that industry was most quickly able to satisfy the new regulations.

In October 2012, the introduction in Japan of a Carbon Tax (Tax for Climate Change Mitigation) added a surcharge to the existing Petroleum and Coal Tax, based on a sliding tax rate that corresponded to the CO₂ emitted by each fossil fuel. In order to reduce the burden of this additional cost, the new tax rate was to be introduced in stages, the second of which was implemented in April 2014. As the tax is designed as a means of reducing energy-derived CO₂ emissions, tax revenues are used to fund energy-saving policies and the introduction of renewable energy sources. Additionally, a scheme introduced in 2011 for promoting energy-related investment, called the Green Investment Tax

Credit, provides support primarily for capital investment in renewable energy facilities and energy-efficient/low-carbon facilities utilizing the latest technology.

The Voluntary Action Plan is a key element in environmental countermeasures by Japanese industry. Under this Action Plan, businesses declare their targets and the government reviews progress made. This can be very effective when the non-binding targets are perceived as commitments to the community. The Action Plan was formulated as a primary initiative for a solution to global warming by industries affiliated with Keidanren, the Japan Business Federation. A new series of initiatives following on from the Action Plan is the Low-Carbon Society Action Plan, which is based on the development and increased use of low-carbon products as well as the medium- and long-term development of innovative technology. These initiatives are expected to promote the flexible development of technology in response to the circumstances of various industries.

Expanded use of renewable energy technology due to Feed-in Tariffs

As of December 2013, the total capacity of renewable-energy power generation facilities that have come into operation has increased by about 30% since the start of the Feed-in Tariff scheme in July 2012, and over 90% of this increase involves solar power generation. For example, the world's first large-scale floating solar power plant was built in Okegawa, Saitama. This megawatt solar power plant features increased efficiency in power generation due to the cooling effect of the water on which the solar panels float. This configuration also helps reduce evaporation of the water as well as mitigate unusual outbreaks of algal bloom, thereby potentially providing enhanced utility if sited at irrigation reservoirs or retention basins.

Floating megawatt solar plant in Okegawa



Source: West Holdings Corp.

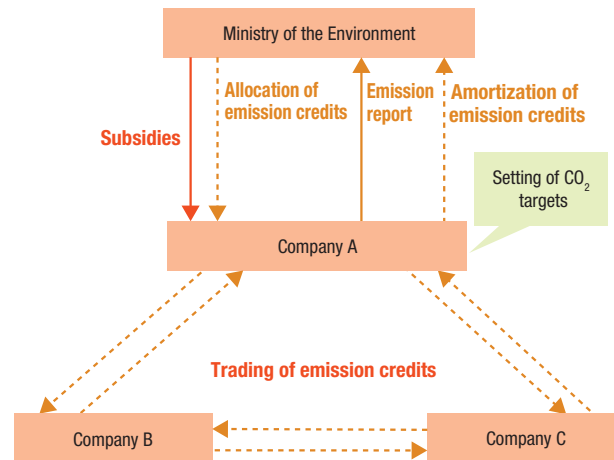
Expanded use of Best Available Techniques

In an effort to maximize the industry's adoption of Best-Available Techniques (BAT), Japan has established a system that supports companies proactively adopting BAT, and whereby participating companies collaborate to achieve targets. Participating companies select BAT from a list prepared by the government, after which they determine their own targets for reducing CO₂ emissions. The decision on whether the project receives support is determined by a reverse auction format that gives precedence to the most cost effective measures, thereby facilitating adoption of measures with the lowest cost per one-ton reduction of CO₂ emissions. Additionally, market mechanisms were adopted to enable emissions trading between participating companies as a means for achieving targets. This enables companies that were unable to achieve targets on their own to do so by purchasing surplus emission credits from companies that have already achieved their targets.

The Tokyo Olympics and the green economy

Planning of the Tokyo 2020 Olympic and Paralympic Games will make full use of Japan's environmental technology in the development of measures to mitigate environmental impact. Specifically, the use of low-pollution, highly fuel-efficient vehicles, mea-

Achieving major reductions in CO₂ emissions through effective implementation of advanced methods



Source: Ministry of the Environment

asures to minimize generation of waste as well as to promote its Reuse and Recycling, and other green policies mean that the Olympics will serve as a springboard for promoting the development of environmental technology and presenting other achievable forms of environmental protection and sustainable measures.

Artist's conception of a Olympic Village for Tokyo 2020



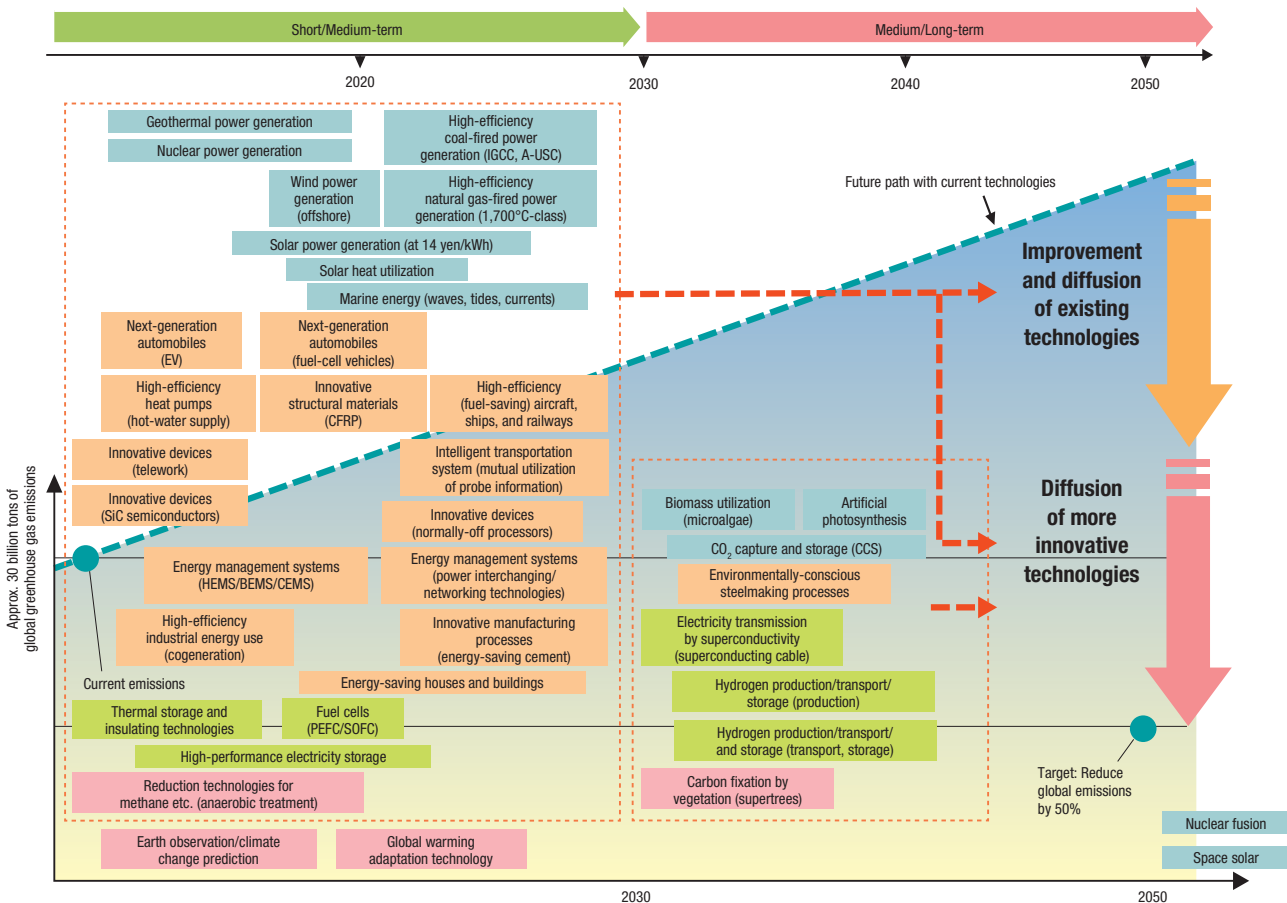
Source: The Tokyo Organising Committee of the Olympic and Paralympic Games

Japan's contributions to low-carbon technology

To achieve the goal of a low-carbon society, it is essential not only that communities adopt superior low-carbon technology for reducing emission of greenhouse gases and other burdens on the envi-

ronment but that these measures lead to economic growth. The September 2013 New Low Carbon Technology Plan shows specific innovative technologies, measures necessary for international deployment and diffusion, and other milestones in the roadmap for development and distribution of Japan's environmental technology.

New Low Carbon Technology Plan: Roadmap for achieving emission reduction milestones by development and distribution of environmental technology



Technologies

Production and supply	Consumption and demand
Distribution and integration of supply/demand	Other technologies

Notes:

1. The center of each bar indicates approximately the time at which the technology is expected to enter the mainstream market.
2. Examples of these technologies are given in parentheses, and were extracted from the main text according to classification as either "Short/Medium-term" or "Medium/Long-term."

Source: Cabinet Office

*1 The center of each bar indicates approximately the time at which the environmental technology is expected to enter the mainstream market based on that technology's roadmap.

*2 "Future path with current technologies" approximates global emission levels over time, assuming no changes in the efficiency of current technology. (The efficiency of coal-fired power generation, for example.)

*3 Reductions in emission levels have been indicated with separate downward arrows for "Improvement and diffusion of existing technologies" and "Diffusion of more innovative technology," but this was done only to indicate that both categories are necessary to achieve the goal of reducing global emissions by 50%. The size of each arrow is not intended to imply the relative size of the contribution of either category.

Industrial and energy conversion sectors: great expectations for CO₂ Capture and Storage

CO₂ Capture and Storage (CCS), included in the New Low Carbon Technology Plan described above, is considered one of the innovative technologies necessary to promoting economic growth in countries around the world while finding solutions to global environmental and energy issues. Trial operation of a

test facility has been underway in Tomakomai, Hokkaido since FY 2012, with the goal of achieving practical application of this technology in Japan by 2020. Beginning in FY 2014, a program is underway that includes maritime transport and studies of a system for injection from on board ship and storage beneath the seafloor. It also includes evaluation of the environmental impact of the amine solvents used to separate and recover CO₂, and geological surveys to find suitable sites for CO₂ storage in Japan's coastal waters.

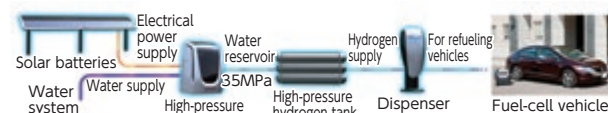
Transport sector—Potential of next-generation vehicles

Hydrogen-powered Fuel-Cell Vehicles (FCVs) have been called the ultimate eco-cars. To promote these vehicles, the Japanese government has been revising its regulatory stance as well as providing support for technological development and verification research into compact solar-recharging and hydrogen-refueling stations. This has been undertaken as part of the preparations for increased use of low-carbon hydrogen-refueling systems based on renewable energies.

A solar hydrogen station at the Saitama Prefectural Government Office



System Configuration



Source: Ministry of the Environment

Environmental products and services industry—International deployment of environmental technology

When emerging and developing countries grow their economies and industrialize, greenhouse gas emissions increase, more waste material is produced, and there are growing issues with contamination of the environment, including water and air pollution. Deploying Japan's environmental technology can make a significant difference to the ability of developing countries to achieve a green economy.

Japanese initiatives for international deployment of low-carbon technology

Global warming and other environmental issues that affect the entire world cannot be resolved by any single country acting alone. A solution requires the efforts of each and every country. Increases in greenhouse gas emissions are particularly conspicuous in emerging and developing countries, and forecasters expect developing countries to account for a growing proportion of worldwide emissions each year. Japan's low-carbon technology can be deployed to provide support for these countries in their efforts to construct green economies, enabling them to achieve state-of-the-art, low-carbon societies in a single bound and thereby leapfrog the carbon-intensive development stage to avoid following the same path traveled by developed nations. Specifically, through the deployment of the Joint Crediting Mechanism (JCM), Japan is working to speed up mitigation actions and the application of sophisticated low-carbon technology, products, systems, services, and infrastructure in developing countries, thereby contributing to sustainable development. Japan is also supporting developing countries in the construction of systems relating to the environment, by means including the dispatch of experts to provide technical guidance. Additionally, in order to support the worldwide implementation of environmental technology, Japan is contributing to the development of international environmental technology standards by chairing two of the ISO Working Groups for CCS.

International deployment of material cycle technology by Japan's waste management and recycling industry

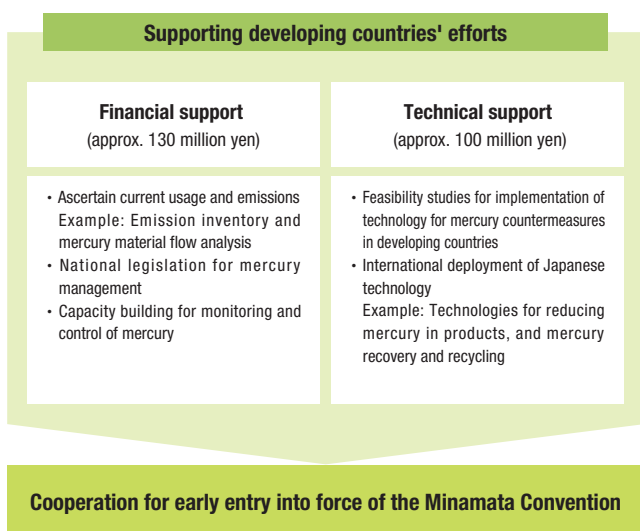
As economies and populations around the world grow, the amount of waste generated globally continues to expand, and the Asian region now accounts for about 40% of all waste material generated worldwide. Japan's own economic development was accompanied by a significant increase in the generation of waste materials, and many other Asian countries are likely to face a similar challenge of constructing suitable waste disposal systems with insufficient technology, experience, and financing. The Japanese waste management and recycling industry now has the potential to operate in overseas markets and provide business solutions suited to local needs and sen-

sibilities. This approach can contribute not only to the solution of local issues, but to an overall reduction of environmental impact across the world. Japan provides support for the development of systems and organizations for waste disposal and recycling in developing countries. It does this by sharing knowledge through international initiatives such as the Regional 3R Forum in Asia and the Pacific, and also through bilateral cooperation with developing countries. Bilateral cooperation includes policy dialogues and support for development of strategies for promoting 3R (reduce, reuse, recycle), and also sponsorship of invitational programs for government agency employees and others dealing with environmental issues in developing countries.

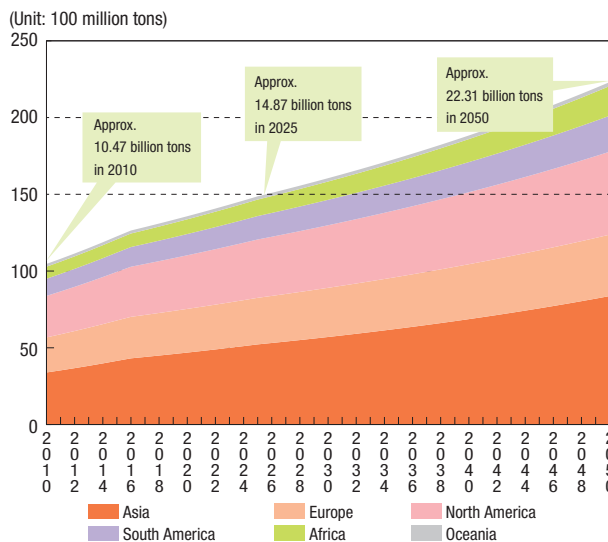
Adoption of the Minamata Convention on Mercury and international contributions using Japan's experience and technology

Minamata disease is a disorder of the central nervous system caused by methyl mercury. Due to mercury pollution, it was once a significant health issue for Japan. Eventually, through the cooperation of government, industry, and the local community, a shared effort succeeded in significantly reducing the discharge of mercury into the environment. Japan is now committed to using its experience and technology to support efforts by developing countries to reduce the discharge of mercury. At the Conference of Plenipotentiaries on the

The MOYAI Initiative



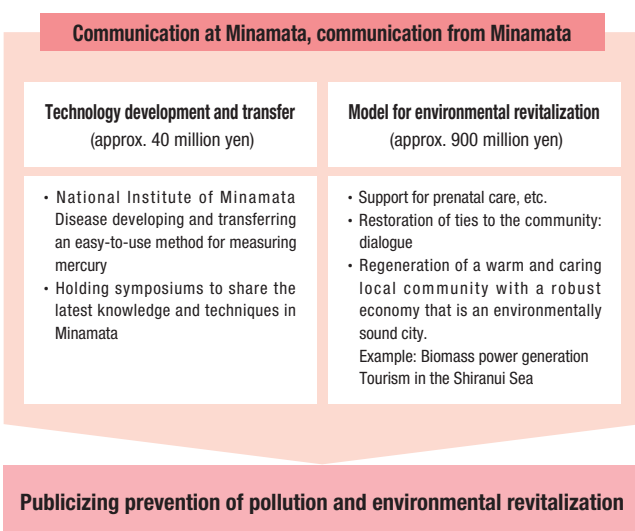
Projected worldwide generation of waste material



Source: Research Institute of Solid Waste Management Engineering

Minamata Convention on Mercury held in Japan in 2013, Japan announced the MOYAI Initiative. The aim of the initiative is to publicize support for developing countries in order to facilitate early entry into force of the Minamata Convention, and to use Minamata as a platform for promoting mercury-related technology and revitalization of the environment.

Additionally, with the adoption of the Minamata Convention, new programs are being implemented to support the development of human resources and build capacity with expertise in the prevention of mercury pollution. These programs use environmental technology and related systems developed through Japan's unique experience with Minamata disease.



Dialogue over economic and environmental issues

* The word moyai refers to a mooring rope used to secure one boat to another. It can also refer to cooperative activities in an agricultural community. In this case, the name MOYAI was chosen to represent dialogue and other cooperative activities for restoration of the community in Minamata.

Source: Ministry of the Environment

Japanese initiatives for international deployment of air pollution control technology

Japan's advanced economic growth was accompanied by significant deterioration of air quality. Low-sulfur crude oil and the desulfurization of heavy oil were introduced, and in conjunction with private sector efforts to develop flue gas desulfurization facilities, these measures gradually succeeded in controlling the air pollution. This experience has given Japan a keen awareness of air pollution. During the 15th Tripartite Environment Ministers Meeting, China, Japan, and Korea discussed the increasingly worrisome air pollution levels of PM_{2.5} (fine particles) in northeast Asia. This discussion led to a resolution to enhance scientific understanding of air pollution and air quality related to suspended particulate matter.

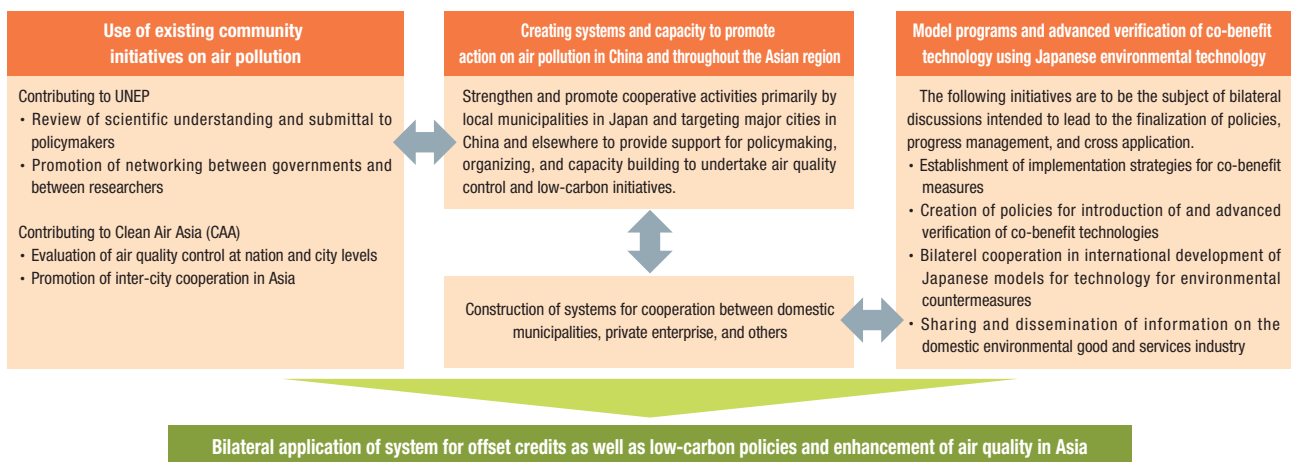
Additionally, Japan has expressed its commitment to simultaneous implementation of low-carbon initiatives and environmental-protection measures in the Asian region through an Asian Environmental Co-Benefit Measures Promotion Program.

Air quality in Yokkaichi—Before and after photographs illustrating the improvement achieved



Source: The City of Yokkaichi

Asian Environmental Co-Benefit Measures Promotion Program



Source: Ministry of the Environment