

**Tokyo Climate Change Strategy:  
Progress Report and Future Vision**

**March 31, 2010  
Tokyo Metropolitan Government**

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## Introduction

In June 2007, the Tokyo Metropolitan Government adopted the Tokyo Climate Change Strategy, setting forth significant policies and measures to achieve its objectives. About three years have passed since it was adopted, and thanks to the understanding and cooperation of Tokyo corporations and businesses, most of the policies and measures proposed in the strategy have been created and are now entering actual implementation—including Japan's first cap-and-trade program.

One of the reasons the Tokyo Metropolitan Government has been able to enhance its climate change strategies over the past three years is that Tokyo has aimed to transform itself into a low-carbon city as soon as possible. A shift towards a low-energy model in terms of Tokyo's corporate activities and urban design is essential for further growth while still maintaining Tokyo's dynamism, especially in a future with greater constraints on carbon dioxide emissions.

There are also other direct benefits of dedicated efforts to implement energy efficiency at business establishments: a reduction of heating and lighting costs. Furthermore, Tokyo showing leadership in climate change strategies can also help create new low-carbon business models.

At the same time, Tokyo's efforts to strengthen climate change strategies are in part to fulfill its responsibilities and role as a megacity; Tokyo's energy consumption, for example, matches that of entire countries in northern Europe, and its GNP would rank sixteenth in the world if it were a country.

The Fifteenth Conference of the Parties to the UN Framework Convention on Climate Change (COP 15) last year was unable to create a clear framework of international strategies to succeed the Kyoto Protocol. Meanwhile, certain errors in the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) attracted attention, and the very fact of climate change was again challenged. Nevertheless, since the Fourth Assessment Report, many reports have actually stated that climate change is proceeding even more than predicted. If humanity postpones effective countermeasures even further, we will lose precious time remaining to avoid a serious crisis of climate change.

Before and after COP 15, there has been a growing effort around the world to strengthen countermeasures at the sub-national level, without waiting for consensus among national governments. In the United States, California and other states, and in Canada, Quebec and other provinces, have decided to launch a cap-and-trade system before their own national governments do so. At the city level as well, innovative efforts have begun—particularly in the construction and transportation sectors. Tokyo's efforts correspond with those of sub-national governments internationally as well as the activities of city governments.

This "Tokyo Climate Change Strategy: Achievements and Future Vision" report, released this day, presents the milestones reached since the adoption of the Tokyo Climate Change Strategy, covers the current state of global climate change countermeasures, shows future prospects of the policies and measures of the Tokyo Metropolitan Government, and also presents proposals to strengthen the measures of Japan overall.

Based on these "Achievements and Future Vision," the Tokyo Metropolitan Government—together with Tokyo businesses, citizens, NGOs and so on—will continue to proactively promote climate change strategies. As a metropolitan local government, and as the largest sub-national government in Japan, Tokyo will continue working to fulfill the roles expected of it.

# **I. Tokyo Climate Change Strategy: Five Achievements**

## **1. Cap-and-Trade and Other Innovative Programs in Collaboration with Tokyo Businesses and Industry Organizations**

The Tokyo Climate Change Strategy proposed the introduction of new policies and measures in areas including the corporate sector, household sector, urban planning, and so on. During the three years since the Strategy was adopted, most of the new policies and measures proposed have been realized, such as a cap-and-trade system that imposed mandatory total emission reductions on large business establishments and instituted emission trading; a “Program for Reporting on Measures against Global Warming” targeting small and medium-sized business establishments; the strengthening of a series of environmental urban planning systems; and so on. Each of these policies and measures is among the most innovative in Japan, and many are also on the leading edge internationally.

The cap-and-trade system, which will be launched in April 2010, aims to reduce total energy-related carbon dioxide emissions, is the third cap-and-trade system in the world, and the first in the world to specifically target the commercial sector. It follows the European Union Greenhouse Gas Emission Trading System (EU-ETS), launched in 2005, and the Regional Greenhouse Gas Initiative (RGGI) in ten north-eastern states of the United States, launched in 2009.

The Tokyo programs could certainly not have been realized by the Tokyo Metropolitan Government (TMG) working alone, and were only possible through the collaborative efforts of many entities, including corporations and industry associations in the city, as well as experts in various fields, research institutes, and NGOs, etc.

After the Strategy was announced, starting with the stakeholder meeting held in January the following year, Tokyo has promoted program design through a number of discussions about the details of the needed policies and measures—with corporations, industry organizations and so on, on a variety of occasions. After the ordinance was amended (2008), efforts were advanced for the detailed design of the program regarding decisions about the rate of mandatory emission reduction, the preparation of variety of policies and guidelines, and so on. These efforts included trial implementation with the cooperation of many businesses, advice from experts, personnel from think tanks and nongovernmental organizations in the fields of energy conservation, legislation, financing, accounting, construction, and design.

The experience of realizing these innovative programs during the three years since the Strategy was adopted showed that many stakeholders share a strong commitment to using Tokyo as a launching pad for initiatives to avoid a climate change crisis, revealing Tokyo’s pioneering spirit inwardly and outwardly .

Programs Created or Enhanced by 2008 Amendment of Environmental Protection Ordinance

- Tokyo Greenhouse Gas Emission Trading System (Tokyo-ETS)
- Program for Reporting on Measures against Global Warming (Voluntary submission and mandatory submission)
- Enhancement of Tokyo Green Building Program
  - Expanded scope
  - Introduction of energy efficiency performance standards
  - Introduction of reporting on energy efficiency performance assessments
  - Enhancement of Green Labeling Program for Apartment Buildings
  - Submission of Energy Performance Certificates
- Creation of District Energy Program for Efficient Use
- Certification System for High-Efficiency Household Water Heaters

## 2. Green Buildings: A New Era

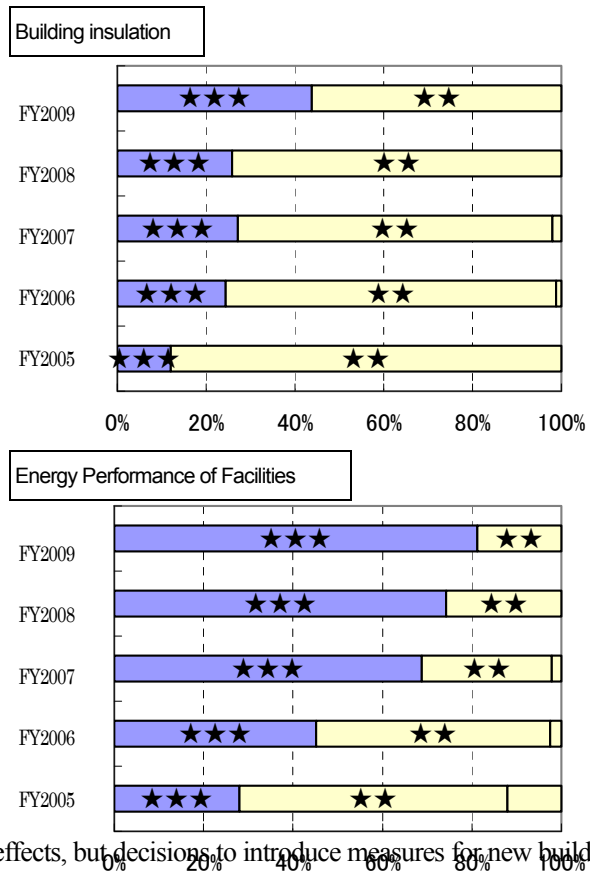
Tokyo has steadily implemented policies and measures toward greater energy efficiency of new buildings and efforts toward low-carbon design. Through the Tokyo Green Building Program, introduced in 2002, all large buildings are assessed for environmental performance, and the results of the assessments are published on the city's website. Also, through the Green Labeling Program for Apartment Buildings), the environmental performance of apartment buildings is being evaluated and indicated by the number of stars earned.

Developments using floor area bonuses make it mandatory to achieve higher energy efficiency than what is required by Japan's Act on the Rational Use of Energy, and also create green space; programs that recognize higher bonuses have also sought to make these developments "top runners" (most efficient buildings and technologies) from the perspective of energy performance and environmental measures.

These policies and measures are having cumulative effects, but decisions to introduce measures for new buildings and the mandatory reduction of total emissions are also effective, and their benefits are becoming increasingly evident. Two-thirds of the office buildings targeted by the Tokyo Green Building Program significantly exceed the thermal performance (insulation efficiency) criteria under the Act on the Rational Use of Energy, and the performance of apartment buildings is also improving steadily.

If we look at examples of construction currently under way, we see one initiative after another that attains standards dramatically higher than in the past. Examples include buildings that—with the goal of halving office carbon dioxide emissions—have plans for large-scale installation of solar panels, as well as new radiation cooling/heating systems, and LED lighting; and even in buildings that already boast the lowest level of carbon dioxide emissions, in some cases equipment is being upgraded to reduce carbon emissions even lower when new wings or annexes are built. Three years after the adoption of the Strategy, a new era of green buildings has dawned in Tokyo.

**Green Labeling Program for Apartment Buildings:  
Improvements in Energy Performance  
(3 stars is highest rating) As of March 19, 2010**



### 3. Creating and Promoting Low-Carbon Business Models

Initiatives of Tokyo since the Tokyo Climate Change Strategy was adopted have been boosting demand for highly energy-efficient products and for renewable energy, and have also helped to create new low-carbon business models originating in Tokyo.

Before the launch of a new subsidy program for solar energy installation, TMG held a Kickoff Meeting to Promote Cooperation to Expand the Use of Solar Energy in August 2008 for equipment manufacturers, home builders, energy contractors, financial institutions and so on to meet in one place. To date, 250 related businesses and organizations are participating in this project.

By promoting more use of solar power through collaboration with these corporations and bodies, the installations of solar power generation in Tokyo, combined with the effects of separate subsidies by wards and cities, had quintupled in Tokyo, compared to the national pace of introduction (which has roughly doubled).

With solar heating equipment as well, performance certificate programs, the Green Heat Certification System, and so on, have been established. The creation of the Solar Energy Unitization and Promotion Forum, by which natural gas contractors promote initiatives to advance solar power, is resulting in the development of new business models.

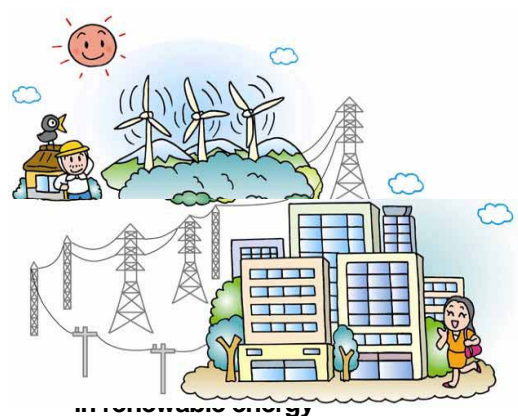
An interregional cooperation agreement to promote renewable energy, signed in December 2009 between Tokyo and Aomori Prefecture, opened a new path for innovative businesses to use power transmission contracts to supply “Live Green Electricity” from windpower plants in Aomori to large commercial buildings in Tokyo’s city center, and launched the participation of “Green PPS” contractors in the electricity market (PPS = power producers and suppliers).

The dawning of a new era of green buildings also creates new business opportunities for the construction industry and developers. Tokyo’s climate change strategies are also creating new models for economic stimulation, including the creation of emission reduction credits for energy efficiency efforts of small and medium-sized business establishments, and the emergence of businesses relating to calculation and trading in emission credits.

**Applications for National Subsidy on Photovoltaic Systems**

	2004	2009	Rate of increase
Nationwide	54,475 cases	121,404 cases	About doubled
Tokyo	1,554 cases	Approx. 7,600 cases	About 5 times

Note: 2009 figures for Tokyo estimated from data published by JPEC.



**4. Enhancing Programs to Promote the Tokyo Climate Change Strategy**

In the process of promoting initiatives based on the Tokyo Climate Change Strategy, frameworks to promote policies and measures have also been strengthened, including the institutional structure of the entire Tokyo Metropolitan Government, collaboration with wards and municipalities, the establishment of the Tokyo Metropolitan Center for Climate Change Actions, and so on.

**(1) 10-Year Project for a Carbon-Minus Tokyo**

In the interest of presenting to the world an example of what cities should aim for in the future, TMG announced its goal of reducing GHG emissions by 25 percent by 2020 compared to 2000, as part of “Tokyo’s Big Change: The 10-year Plan,” adopted in December 2006. Toward its realization, the Committee for the Promotion of a Carbon-Minus Tokyo was established, headed by the Vice Governor of Tokyo, and the 10-Year Project for a Carbon-Minus Tokyo was launched in 2007 to share from Tokyo some of the world’s most exemplary climate change strategies worldwide. Since fiscal 2008, Tokyo has developed policies and measures shown in the table.

TMG as a whole has promoted strategies such as programs to support R&D into energy efficiency by small and medium-sized businesses, programs to promote energy efficiency at social welfare facilities and private schools, programs for major reductions of emission gases from sewerage facilities, and so on.

	Projects applying policies and measures	Budget (billion yen)
FY2008	98	20.3
FY2009	107	36.5
FY2010	115	39.1

**(2) Collaboration with Wards and Municipalities in Tokyo**

To effectively promote climate change strategies, Tokyo cannot work alone, but must also to engage all areas in the metropolitan region. For that purpose, in fiscal 2009, Tokyo established the new Tokyo Metropolitan Government Subsidy Program for Municipalities to Promote Climate Changes Strategies, and using it to support a leadership role of wards and municipalities in local initiatives. This program includes Proposal Projects which cover 100 percent of costs where a ward or local municipality creates a project that is pioneering in character and has a multiplier effect, and Option Menu Projects in which Tokyo covers a portion of costs where a ward or municipality implements a project specified by Tokyo. In all, Tokyo has provided financial assistance to a total of 36 organizations under this program.

Through Proposal Projects, wards and municipalities are actively trying out projects that make use of the latest technologies and local potential. Through Option Menu Projects, they are establishing numerous programs to subsidize energy-efficient equipment.

Examples of Ward and Municipality Proposal Project Initiatives

Arakawa Ward	Ward Government and Resident Electric Car Joint Use Demonstration Trial Project	Ward offers car sharing using electric cars and rapid battery chargers, through collaboration with private sector businesses
Hino City	Project calling for people to make "Everyday Declaration to Reduce CO2 Emissions"	Calling for participants from citizens and businesses for the "Everyday Declaration to Reduce CO2 Emissions," to promote voluntary carbon dioxide reduction efforts. By launching a website, collaboration with local area and universities, tie-ups with various events, and so on, aim to have half of the entire city make the declaration by 2012 (35,000 households, 2,500 businesses).
Oshima Town	Project to introduce renewable energy (power generation from hot springs, etc.)	Implementation of studies relating to geothermal energy. After next fiscal year, based on study results, introduce hot springs power generation and hot springs heat pump to town facilities as model project.

In the area of solar energy, at events with citizen participation and organized by wards and municipalities, Tokyo held Solar Energy Trade Shows that included exhibits of solar-powered equipment and so on. In 2009, Tokyo aimed to expand the use of solar energy in liaison with wards and municipalities through 35 such trade shows, among other activities.



**(3) Establishment of the Tokyo Metropolitan Center for Climate Change Actions**

On April 1, 2008, Tokyo established the Tokyo Metropolitan Center for Climate Change Actions, as a base to support climate change prevention initiatives of citizens and small and medium-sized businesses. The Center plays important roles, with activities including a total of 653 free energy audits under contract with TMG for small and medium-sized businesses, administration of subsidies to support the introduction of household appliances powered by solar energy, and efforts to provide the foundations for the promotion of broad climate change strategies in Tokyo together with the Metropolitan, ward, and municipal governments.

### 5. Sharing Innovative Policies with the World

The initiatives of Tokyo since adopting the Tokyo Climate Change Strategy have also been innovative on the international level, attracting strong interest from overseas. Tokyo has received a steady stream of requests for information from the city governments of London, Paris, Sidney, and Seoul, as well as the European Union, Word Bank, and research institutes, and has also received many invitations to attend international meetings. Before Tokyo’s cap-and-trade system was launched in April 2010, international media covered the story, including “Tokyo initiatives becoming a model for all of Japan” (Reuters), and “Tokyo beats central government in launch of cap-and-trade system" (Bloomberg).

The worldwide spread of information about the Tokyo Climate Change Strategy—notable for involving both businesses and the Tokyo government, among other stakeholders—contributes to the advance of climate change countermeasures worldwide, raises the presence of Tokyo globally, and benefits Tokyo's image.

To these ends, Tokyo has provided information about Tokyo’s policies and measures using a variety of opportunities, such as the C40 Large Cities Climate Leadership Group, the Copenhagen Climate Summit for Mayors, side events at the COP15 Climate Conference in Copenhagen in December 2009, and so on (see Table 1). Tokyo was also the first Asian governmental organization to participate in the International Carbon Action Partnership (ICAP), in May 2009 (see Table 2).

Table 1. Providing Information to the World

When	Meeting (City)
Feb. 2008	Asian Workshop on Energy and Environmental Technologies (Tokyo)
Oct. 2008	C40 Tokyo Conference on Climate Change (Tokyo)
May 2009	Third C40 Large Cities Climate Summit (Seoul)
Sept. 2009	Tokyo Workshop 2009 on Urban Cap & Trade – Towards a Low Carbon Metropolis (Tokyo)
Nov. 2009	Asian Network of Major Cities 21 (ANMC21) (Bangkok)
Dec. 2009	China-Japan Low Carbon Cities: Workshop on Low Carbon Development Styles (Beijing)
	Copenhagen Climate Summit for Mayors (Copenhagen)
	COP 15 Side Events (Copenhagen)
Feb. 2010	The Future of Cities Conference, Chatham House (London)

Table 2. ICAP Members (29 countries and states, etc.) (As of March 31, 2010)

European Union (11)	European Commission, Denmark, France, Germany, Greece Ireland, Italy, the Netherlands, Portugal, Spain, England
United States, Canada (14)	US: Arizona, California, Maine, Maryland, Massachusetts, New Jersey, New York, New Mexico, Oregon, Washington Canada: British Columbia, Manitoba, Ontario, Quebec
Others (4)	Australia, New Zealand, Norway, Tokyo Metropolitan Government

## **II. International Climate Change Responses**

### **1. COP 15 and the Copenhagen Accord**

The 15th session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP 15), held in Copenhagen in December 2009, postponed its original goal of reaching an agreement on a legally binding international framework to succeed the Kyoto Protocol. The COP 15 meeting did result in the Copenhagen Accord, however, which included an agreement that nations would submit reports by the end of January 2010—with developed countries reporting on their establishment of emission reduction targets for the year 2020, and developing countries reporting on the emission reduction measures they will undertake—in keeping with the goal of limiting global temperature increases since the start of the Industrial Revolution to under 2 degrees Celsius.

Seventy-five countries submitted lists of their reduction targets or emission reduction measures, including countries such as the United States, China and India, which had previously not established specific numerical targets under the Kyoto Protocol. The countries participating in the Copenhagen Accord (as of March 24, 2010) account for 82% of overall global emissions of greenhouse gases.

While some observers note that it will be difficult to reach an agreement on a legal framework at the COP 16 meeting in Mexico in late 2010, the deepening of the climate crisis will not allow for actions to be deferred because of a delay in achieving an international agreement. Actors that have a strong commitment and the capabilities to address climate change must take the initiative to bolster their efforts.

### **2. The Growing Climate Crisis**

Around the time of the COP 15 meeting, the views of so-called climate change “skeptics”—those denying that global warming is occurring and denying the influence of human activities on global warming—gained new ground, in part due to errors found in the IPCC Fourth Assessment Report. Nevertheless, the IPCC Fourth Assessment Report should not be rejected in its entirety due to errors in parts of the document. Scientific reports released since the Fourth Assessment Report confirm the reality of global warming, and in fact, it has been suggested that projections in that Report have underestimated the anthropogenic influence on climate change.

#### ***Climate Change Proceeding Faster than Projected by the IPCC Fourth Assessment Report***

In November 2009, prior to the COP 15 meeting, 26 climate scientists, including some of the IPCC lead authors, issued a report called the “Copenhagen Diagnosis.” It stated that overall global carbon dioxide emissions in 2008 were 27% higher than 1990 levels, and CO<sub>2</sub> emissions from fossil fuel combustion and cement production had increased by 40%. The accelerating growth in CO<sub>2</sub> emissions was found to be following the IPCC Fourth Assessment Report’s highest emissions scenario.

Moreover, the extent of Arctic summer sea ice during the years 2007 to 2009 was about 40% below the average level projected by the climate models used for the IPCC Fourth Assessment Report, with the melting rate of sea ice accelerating much faster than the projections of climate models. In addition, the rise in average sea levels over the past 15 years (at a rate of 3.4 millimeters per year) was roughly 80% higher than IPCC projections; this accelerating

sea level rise is consistent with a doubling of melting rates for glaciers and ice sheets.

In response to criticism it had received, the IPCC announced in March 2010 that it had requested an external organization, the Inter Academy Council (IAC), to conduct an independent review of the processes and procedures used in preparing IPCC reports, with the aim of improving the quality of climate change assessments. The IPCC's Fifth Assessment Report is scheduled to be prepared in 2013 and 2014 with these and other improvements, but the advance of global warming does not allow any room for delay in strengthening response measures.

### **3. New Actors in Climate Strategies: Sub-National Governments**

Since last year, various cities and sub-national governments (state, prefectural and regional governments) around the world—the new actors in climate strategies—have taken action to strengthen related activities, without waiting for national governments to arrive at an agreement.

#### ***Activities by Alliances of Cities***

The Copenhagen Climate Summit for Mayors, held as a side event at the COP15 meeting in 2009, highlighted the important role of cities in addressing climate change. In February 2009, some 400 cities formed the Covenant of Mayors, an alliance of cities pledging to surpass the 2020 target set by the European Union (for a 20% reduction in emissions compared to 1990 levels); this organization has now grown to include the participation of over 1,300 cities.

In Asia, through the Cool ASEAN—Green Capitals Initiative, capital cities of the Association of Southeast Asian Nations (ASEAN) member countries, and other cities, are undertaking climate actions ahead of their national governments. In East Asia, anticipating that South Korea will be subject to emission reduction commitments under a post-Kyoto regime, the city of Seoul is undertaking ambitious initiatives, including plans to meet the target of a 40% reduction in greenhouse gas emissions by 2030.

#### ***Leading Efforts by Sub-National Governments: Club of 20 Regions (R20) Established***

Meanwhile, in North America, three regional groupings at the state level are promoting the introduction of emissions trading: the Regional Greenhouse Gas Initiative (RGGI), the Midwest Greenhouse Gas Reduction Accord (MGGGA), and the Western Climate Initiative (WCI). Activities under the RGGI became operational in January 2009, and an expanded regional emission trading system is expected to begin in January 2012, with the participation of California (a member of the WCI), Quebec, British Columbia and others.

In addition, it has been announced that the Club of 20 Regions (R20) is being created as a network bringing together these state-level initiatives in the United States and Canada with other sub-national initiatives promoting pioneering measures, such as in the Île-de-France region in France and Delta State in Nigeria, with the aim of going beyond the climate change measures of various national governments.

These efforts on the part of city governments and sub-national governments can become a driving force moving climate change strategies forward, overcoming the current stalemate in negotiations between countries.

Tokyo aims to play a positive role at the center of these kinds of new initiatives.

### **III. Commitment to Climate Change Strategies in Each Sector**

Building on the achievements of the Tokyo Climate Change Strategy so far, the Tokyo Metropolitan Government (TMG) is working with a variety of stakeholders in Tokyo—including corporations and business organizations, citizens, NGOs and others—to fully implement the systems that have been developed and to promote further measures to achieve targets for greenhouse gas emission reductions by 2020 from commercial and industrial sectors, household sector, motor vehicle sector, and other sectors. Success in these efforts is expected to also contribute to the advancement of Japan’s overall efforts to address climate change.

#### **1. CO2 Emission Reduction Strategies for Facilities**

##### **(1) Implementation of the Tokyo Emission Trading System (Tokyo-ETS) Cap-and-Trade Program**

So far, 28 briefing sessions have been held for companies subject to the Tokyo Emission Trading System (Tokyo-ETS), with a total of 12,000 people participating. Based on energy usage data submitted by the business entities covered under the previous CO2 Emission Reduction Reporting Program, at the end of March 2010, a total of 1,332 facilities were designated as being subject to the Mandatory Emission Reduction and Emission Trading Scheme. In addition, 28 organizations had been registered as of the end of March 2010 as Registered Emission Verification Entities, which validate emissions and related data. Also, guidelines for monitoring, reporting and verification (MRV) of emission reduction credits (including for Small and Medium-sized Facility Credits Within the Tokyo Area, Renewable Energy Certificates, and Emission Reductions Outside the Tokyo Area) for use under the emission trading system were issued in March 2010.

Through proper implementation of the systems that have been developed, TMG aims to achieve reductions in the total CO2 emissions from large facilities. In preparation for the launch of the emission trading system beginning in fiscal 2011, elements necessary for the smooth operation of emission trading are being put in place, including the development of Guidelines on Trading Operations, and the preparation of the Emission Reduction Registry, which serves as the foundation for emission trading. (See “Emission Trading Scheme (Draft),” in the reference materials at the end of this document.)

##### **■ Conducting Projects to Support the Smooth Implementation of Mandatory Emission Reductions**

While achieving mandatory emission reductions can be accomplished either through emission reduction measures implemented directly at each facility or by making use of emission trading, the reductions achieved through energy conservation measures at facilities will also lead to reduced ongoing energy costs.

Three types of credits for excess emission reductions can be utilized through the Tokyo-ETS; those under the Small and Medium-sized Installation Credits Within the Tokyo Area contribute directly to the reduction of CO2 emissions within Tokyo by the commercial and industrial sectors. The following initiatives are being undertaken to facilitate the creation of Small and Medium-sized Installation Credits Within the Tokyo Area.

**(a) Energy Efficiency Advice Based on the Standards for Certifying Top-Level (Outstanding) Facilities**

Starting in the summer of 2010, energy conservation specialists will conduct visits to relevant facilities, upon request, to provide advice based on the Standards for Certifying Top-Level Facilities (requests will be accepted starting in the summer of 2010; if the number of requests exceeds capacity, a lottery may be held to select facilities.)

**(b) Practical Seminars on Fine-Tuning Energy Conservation Measures**

There are many examples of emission reductions achieved through the fine-tuning of energy conservation measures, such as through recalibrating heating and other equipment and by optimizing operational processes to match the individualized circumstances of each facility. Seminars on the fine-tuning of energy conservation measures, including the participation of leading experts in this field and operators of facilities that have achieved reductions, will be held in order to share experiences and know-how (this seminar is planned for the second half of fiscal 2010).

**(c) Seminar for Tenant-Occupied Buildings**

In the case of facilities that are rented out to tenants, both the building owners and the tenants need to make efforts to reduce emissions; business enterprises larger than a specified size and which are tenants are obligated to prepare and submit their own emission reduction plans. In order to promote greater energy conservation measures on the part of such tenant businesses, a seminar will be held on June 28 and 29 2010, bringing together tenant businesses and other participants.

**(d) Seminar on the Greening of Data Centers**

While data centers are gaining in importance in keeping with their role as a critical component of the infrastructure of our information society, demand for electricity to power data centers is also increasing rapidly; a key concern in the future will be how to ease this demand for electricity, which is expected to continue to grow substantially. While data centers are required to reduce emissions, efforts are still needed to support the efforts of data center operators; for this reason, a seminar addressing energy conservation measures of data centers will be held, bringing together businesses, facility operators and information technology professionals (planned for the latter half of fiscal 2010).

**(e) Seminar for Supporting Projects to Create Small and Medium-Sized Installation Credits Within the Tokyo Area**

To promote projects to create emission credits for small and medium-sized installation within the Tokyo area, a seminar will be held on May 31 and June 1, 2010, bringing together representatives of facilities required to reduce emissions, small and medium-sized businesses, energy conservation contractors and financial institutions, in order to familiarize participants with projects that can qualify for credits as well as with important considerations for setting up related projects.

■ **Schedule of Activities Related to Large Facilities**

Fiscal 2010	
April 1	Start of mandatory emission reduction scheme
Mid May	Briefing session held concerning emission trading rules (concepts), rules for monitoring, reporting and verification related to the Small and Medium-sized Installation Credits Within the Tokyo Area, and related topics
Early June	Workshop held for managers of facilities subject to mandatory emission reductions Seminar held for representatives of tenant businesses
June 15	International Carbon Action Partnership (ICAP) Tokyo Conference 2010
End of June	Seminar for Supporting Projects to Creation Small and Medium-sized Installation Credits Within the Tokyo Area
Mid July	Briefing on how to prepare a CO2 Emission Reduction Plan
End of Sept.	Deadline for applications regarding emission baselines → After establishing emission baselines, emission reduction amounts (emission caps) are established and notifications made
End of Nov.	Submission of CO2 Emission Reduction Plans → Public notifications made by the companies themselves (Report of actual emissions and details of future plans)
End of Dec.	Application deadline for top-level (outstanding) facilities (Group I)
End of March	Application deadline for top-level (: outstanding) facilities (Group II)
Fiscal 2011	
April	Start of emission trading program (launch of Emission Reduction Registry)
End of Nov.	Submission of CO2 Emission Reduction Plans → Public notifications made by the companies themselves (Report of actual emissions and details of future plans)
<p>Fiscal 2012–2014:</p> <ul style="list-style-type: none"> <li>• CO2 Emission Reduction Plans (reports of actual emissions and the details of future plans) are to be submitted by the end of November each fiscal year.</li> <li>• Facilities subject to the cap-and-trade program carry out their obligations to reduce emissions through (1) activities undertaken at the facilities in question and/or (2) offset credits created through the activities of others (through emission trading).</li> </ul> <p>By the End of Fiscal 2015: TMG verifies that emission reduction obligations are met</p>	

Note: In addition, following receipt of the CO2 Emission Reduction Plans presented by the facilities subject to the emission reduction program (plans must be submitted by the end of November each fiscal year), TMG will prepare a summary and determine emission reductions required for each facility, along with reports of fiscal year emission volumes.

#### **(b) Strategies for Small and Medium-Sized Facilities**

To improve the greenhouse gas reduction performance of small and medium-sized businesses establishments, TMG will undertake initiatives to support emission reduction measures, including through utilization of the free energy consumption diagnosis service of the Tokyo Metropolitan Center for Climate

Change Actions and the new Programs for Reporting on Measures against Global Warming.

(1) Start of the Programs for Reporting on Measures against Global Warming

In April 2010, the Programs for Reporting on Measures against Global Warming took effect. Under this system, small and medium-sized facilities not required to reduce total emissions—that is, those businesses having an annual energy consumption of less than 1,500 kiloliters crude oil equivalent (COE)—will report to TMG their energy consumption and the status of energy conservation activities. This system, designed to allow small and medium-sized businesses to easily assess their CO<sub>2</sub> emissions and undertake concrete energy conservation measures, is intended to advance the emission reduction activities of small and medium-sized businesses. The efforts of these facilities have been limited to date.

Any businesses having a combined total annual energy consumption of 3,000 kiloliters COE or more at multiple establishments in Tokyo must submit reports. It is estimated that approximately 300 such businesses, representing some 30,000 establishments, will be required to report.

Various supporting efforts have been put in place to facilitate the participation of businesses in this system: TMG has prepared an easy-to-use handbook for Reporting on Measures against Global Warming, which contains a menu of energy conservation activities that businesses can undertake; tools for Reporting on Measures against Global Warming have been developed that allow businesses to easily assess their greenhouse gas emissions and prepare reports; and briefing sessions are being held for business operators.

In March 2010, a memorandum of understanding was signed with the *Tokyo Hojinkai Rengokai* (corporate tax payers' associations in Tokyo area) to promote this reporting system and the voluntary submission of reports. Additional efforts will be made in the future to work with business organizations and others in order to promote the emission reduction activities of small and medium-sized facilities.

**(2) Project to Promote Energy Conservation and Create Emission Credits for Small and Medium-Sized Facilities**

A two-year-long project starting in fiscal 2010 is being undertaken with the goal of achieving broad-based adoption of effective emission reduction measures on the part of small and medium-sized facilities and for monitoring, reporting and verification of measures actually being implemented, such as energy-efficient equipment upgrades, that will reduce emissions and may be used to create credits under the Program for Emission Credits for Small and Medium-sized Installations in the Tokyo Area.

Under this project, subsidies will be provided to small and medium-sized facilities in Tokyo for energy-saving equipment upgrades that are performed in response to an energy consumption diagnosis or similar study, on the condition that any CO<sub>2</sub> emission reduction credits thereby created are to be transferred at no cost to TMG. It is anticipated that widely publicizing the results of this project will spur independent energy-saving actions on the part of other business entities.



## 2. CO2 Emission Reduction Strategies for Motor Vehicles

CO2 emissions from motor vehicles account for approximately one-quarter of Tokyo’s total CO2 emissions. While TMG has been implementing a number of related measures—including a Vehicle Emission Reduction Program, promoting fuel efficient driving (“eco-driving”), and promoting the utilization of low-pollution and fuel-efficient vehicles—it will be necessary to strengthen measures even further in order to achieve the emission reduction targets set for the year 2020.

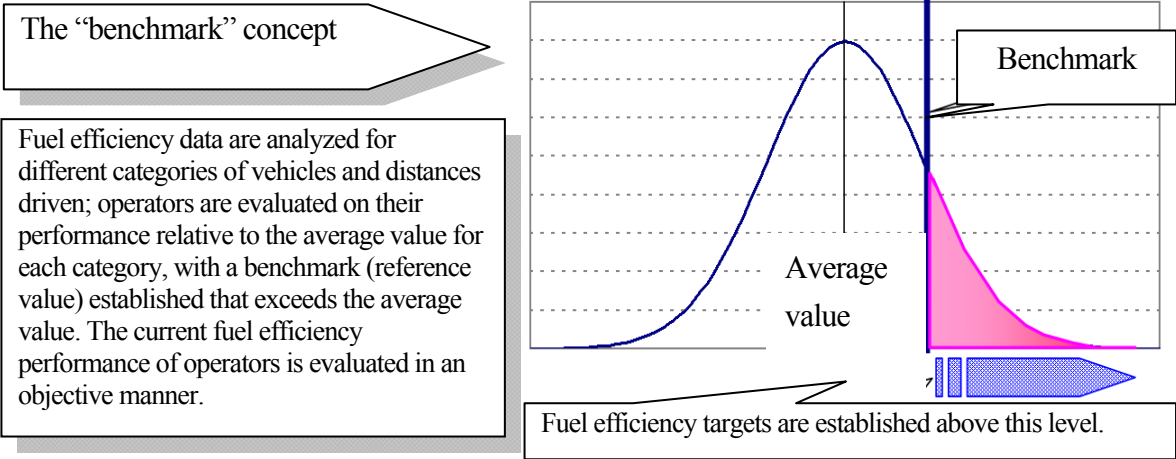
### (1) Improving Fuel Efficiency of Passenger Vehicle Fleet

One-half of Tokyo’s CO2 emissions from vehicles come from passenger cars. In order to achieve the widespread adoption of next-generation vehicles—such as electric vehicles (EVs) and plug-in hybrid vehicles (pHVs)—TMG will continue to work extensively with manufacturers of vehicles and charging equipment, electric utilities, and businesses using EVs and pHVs, and will support the adoption of such vehicles by small and medium-sized businesses and the installation of charging stations.

As of the end of fiscal 2008, 97% of the 3.16 million passenger vehicles registered in Tokyo were gasoline-powered—and because the overwhelming majority of vehicles are expected to be gasoline-powered even by 2020, reducing CO2 emissions in the motor vehicle sector will necessitate not only next-generation vehicles but also improvements in the fuel efficiency of all passenger vehicles, including gasoline-powered cars. TMG will therefore implement outreach activities targeting Tokyo’s citizens and businesses, and will undertake a wide range of measures intended to spur consumers to select highly fuel-efficient vehicles.

### (2) Implementation and Strengthening of “Benchmarking” and Guidance for the Transportation Sector

To achieve voluntary and sustained CO2 emission reductions in the transportation sector, TMG initiated a project to accelerate adoption of eco-driving by transportation companies. Building on the improved levels of fuel efficiency achieved as a result of this project, TMG will establish a system to evaluate eco-driving and other measures taken by transportation companies, and establish benchmarks (reference values) for evaluating their fuel efficiency goals. Guidance will be provided to transportation companies regarding eco-driving and improved transport efficiency in reference to these benchmarks, and consideration will be given to potential incentives that could encourage shippers and others to utilize transportation companies that are achieving a high level of efficiency.



### (3) Measures Targeting Improved Traffic Volumes

TMG has conducted pilot projects to reduce traffic volumes through combining car sharing programs with public transportation use, as well as social experiments for improving transport efficiency such as shared delivery programs. The results of these initiatives will help inform efforts to continue to reduce the environmental impacts of motor vehicles, and TMG will continue to pursue measures to reduce traffic volumes through shifting demand away from an over-reliance on automobiles.

## 3. CO2 Emission Reduction Strategies in the Household Sector

### (1) Supporting Energy Conservation

The Household Energy Consultant Program was initiated in March 2010 by TMG in cooperation with partners related to household energy consumption, including gas companies, electric utilities, and other businesses and organizations such as consumer cooperatives. Under this system, experts in household energy conservation who are registered with the metropolitan government as Household Energy Consultants visit households and provide residents with energy-saving advice tailored to their individual circumstances, free of charge. In addition to expanding and enhancing such energy conservation evaluation activities in the future, TMG will promote enhanced energy conservation efforts by households, and will work in conjunction with the Tokyo Metropolitan Center for Climate Change Actions to promote awareness of what households can do to reduce their emissions.

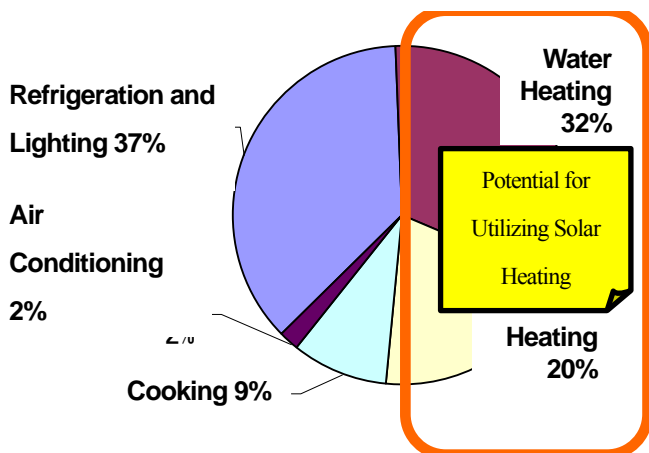


(Photo: Tokyo Gas Co.)

In order to reduce greenhouse gas emissions associated with water heating, which accounts for roughly 30% of household energy consumption in Tokyo, in November 2009 TMG launched the Certification System for High-Efficiency Household Water Heaters, which certifies highly energy-efficient household water heaters and provides information to the public. In the future, TMG will continue to provide information about superior energy-conserving household electric appliances.

### (2) Expanding the Use of Solar Energy

#### Household Energy Consumption by Usage



To achieve the goal of realizing an installed solar power generating capacity within Tokyo equivalent to one million kilowatts by 2016, in fiscal 2009 TMG initiated a two-year-long project to provide subsidies for a target of 40,000 solar power installations. Applications for these photovoltaic system subsidies have been growing steadily with each passing month, and TMG will continue to promote widespread awareness of solar energy, and to accelerate the pace of installations.

Hot water heating and heating of homes account for roughly 50% of household energy consumption.

Low-temperature heat from solar heating equipment can be quite effective for these uses, and the wider adoption of such devices can help to significantly reduce CO2 emissions.

In conjunction with partner organizations, TMG will utilize the Green Heat Certification System and other certification systems that have been developed for the efficiency of appliances, and will promote more widespread adoption of solar heating devices and outreach efforts to increase public awareness of their benefits.

## 4. Expanding the Use of Renewable Energy

### (1) Expanded Use of Solar Power in the Commercial and Industrial Sectors

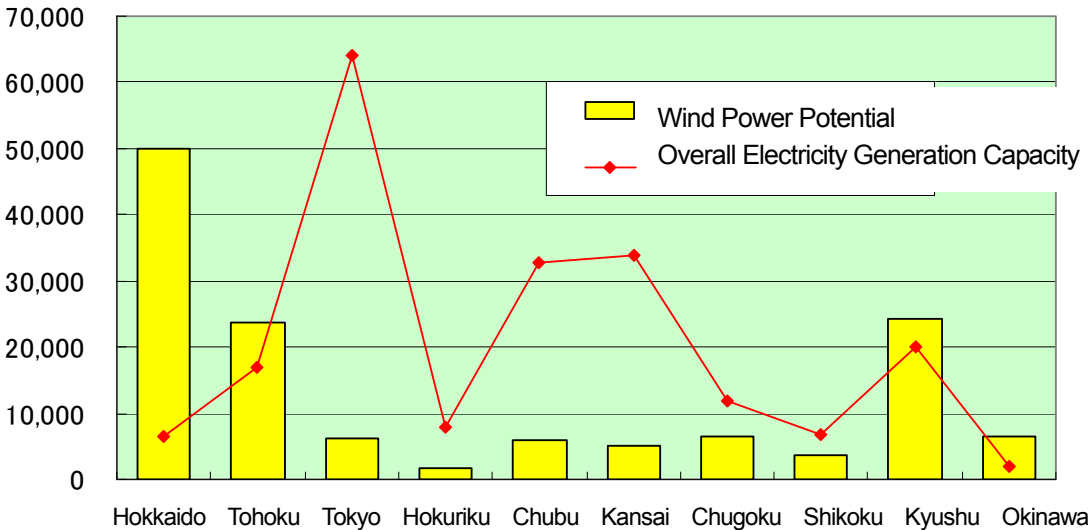
To realize a solar power generation capacity equivalent to one million kilowatts, it will be necessary to promote more widespread utilization of solar power systems not only by households, but also within the commercial and industrial sectors. For this reason, in January 2010 the Tokyo Green Building Program introduced a new requirement that developers must consider incorporating solar power systems into new, large buildings. In addition, TMG has put in place incentives to support the installation of solar power systems: solar power devices are eligible for tax breaks through the Tax Incentive Program for Energy Conservation by Small and Medium-Sized Businesses, and funding is being provided to local municipalities within Tokyo to subsidize the installation of solar power equipment by small and medium-sized facilities. Other measures will be taken to promote expanded utilization of solar energy within the commercial and industrial sectors, including through promoting the use of energy credits under Tokyo Cap-and-Trade Program.

### (2) Interregional Cooperation to Expand Renewable Energy Usage

The greatest potential for wind power development in Japan is in Hokkaido and the Tohoku Region (northeastern Japan), but the energy demand in these regions is lower than the potential for wind power generation. In contrast, large cities such as Tokyo have a huge demand for energy, but little scope for harnessing wind power.

In December 2009, TMG and the government of Aomori Prefecture in the Tohoku Region signed an interregional cooperation agreement to promote renewable energy; this agreement aims to link the supply with demand for renewable energy. In addition, “Live Green Energy” (power generation that produces zero CO2 emissions) is one of the choices available for businesses operating in Tokyo under the cap-and-trade system.

(MW) Wind Power Potential and Overall Electric Utility Generation Capacity, by Region of Japan



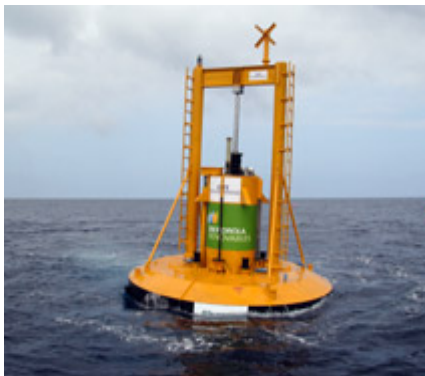
Based on materials from the Wind Power Roadmap Working Group of the Japanese Wind Power Association (January 15, 2010)

### ***The Six-Region Interregional Cooperation Agreement to Promote Renewable Energy***

In order to further expand cooperation among regions, on March 31, 2010, TMG signed an agreement with the prefectural governments of Hokkaido, Aomori, Iwate, Akita, and Yamagata to create a structure for cooperation on renewable energy among these six regions. TMG will continue to work with the national government, financial institutions and others to create a supportive environment for the promotion of related projects, including by matching producers and consumers of Live Green Energy.

### **(3) Promoting Practical Applications of Wave Power Electricity Generation by the Private Sector and Others**

Between July 2009 and March 2010, TMG convened the Wave Power Study Group, which held four meetings that brought together representatives of universities and other organizations to study the potential for wave power generation and the role of wave power under Japan's New Energy Act.



PowerBuoy floating wave power generator Made by Ocean Power Technologies

This study group addressed the status of wave power technology development in other nations, the potential for wave power generation in Japan, economic and commercial feasibility issues, and the selection of wave energy demonstration projects. Study group participants saw a promising future for wave power generation in Japan.

A future initiative under consideration is for a wave power demonstration project near Tokyo's Izu Oshima Island, one of the locations with the highest wave-energy potential in the country; several concerns related to this project have been highlighted, including mooring technology issues and potential impacts on fisheries and maritime transport.

TMG will continue to promote cooperative efforts involving universities and the private sector, and will call on the national government to address wave power development under the New Energy Act.

### IV. Ways to Enhance Japan’s Climate Change Strategies

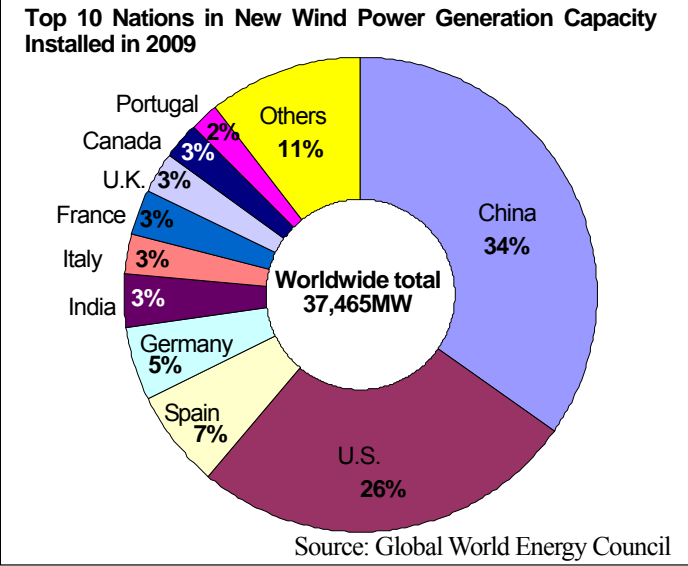
Japan’s new administration, formed in September 2009, announced the goal of reducing Japan’s greenhouse gas emissions by 25% from the 1990 level by the year 2020, provided that the major economies of the world all agree on ambitious reduction targets.

The administration then proposed medium-term reduction targets based on the Copenhagen Accord in January 2010. On March 12 the Cabinet approved the Bill for the Basic Act on Global Warming Countermeasures, which specifies basic policy for domestic efforts to address climate change. This bill stipulates a greenhouse gas emissions reduction of 25% below the 1990 level by 2020, but this is premised “on the establishment of a fair and effective international framework by all major economies, and agreement on their ambitious targets.”

Japan is now being called on to clearly set high goals for emissions reduction and to introduce the strong policies and measures needed to achieve them, whether or not any international agreements have been reached.

This nation has taken pride in outstanding energy conservation technologies, but with the failure to set medium- and long-term CO2 reduction targets and the delay in introducing fundamental emissions reductions measures,

Japan is presently losing superiority in technologies that facilitate the transition to a low-carbon society. The late start in wind power generation, solar energy and other renewable energy is particularly noticeable. For example, Japan’s share of the total new wind power generation capacity of 37.5 million kilowatts (equivalent to 25 large nuclear power plants) installed worldwide in 2009 was a trifling 0.5%. China took the lead with the construction of 13 Million kilowatts of new wind power generation facilities, accounting for over one-third of the global total.



Without a clear framework for policies and systems, it will not be possible to secure stable investment in these sectors over the medium to long term, and Japan will lose major business opportunities.

Following the launch of a team at the vice-ministerial level to examine a national emissions trading system in Japan, the Tokyo Metropolitan Government (TMG) released “Tokyo’s Proposals on the Introduction of a National Cap-and-Trade Program in Japan” in late November 2009, based on Tokyo’s own achievements and experience. Considering developments at the national level from late 2009 through the Cabinet Approval of the Bill for the Basic Act on Global Warming Countermeasures, in addition to cap-and-trade, TMG is now making the following proposals on key policies and measures for buildings, motor vehicles, and the expanded use of renewable energy that the Japanese government should pursue to address global warming.

## **1. Introducing an Effective Cap-and-Trade Program based on Mandatory Reduction of Total Emissions**

The Bill for the Basic Act on Global Warming Countermeasures approved by the Cabinet mentions the creation of a domestic emissions trading system. While the bill does use total emissions as the basis for specifying emissions limits, it also includes a provision for considering an intensity target approach. The details of the program are to be clarified within one year after the Basic Act enters into force, but it is still unclear whether or not an effective cap-and-trade program can really be introduced.

Besides the TMG's proposal, the Japan Federation of Bar Associations and three environmental NGOs have also announced proposals regarding the type of national system that should be introduced. There are minor differences in the details between these and TMG's proposal, but the basic framework is the same. TMG is now offering the following additional proposals to focus on four points that are essential for a highly effective cap-and-trade program.

### **Proposal 1: Introduce Mandatory Reductions in Total Emissions, rather than Intensity (Efficiency Improvement) Regulations**

While there is no doubt that intensity (efficiency) improvements are also important, the cap-and-trade program must clearly aim for a reduction in the aggregate emissions from business establishments affected by the cap-and-trade program. It is the total volume of greenhouse gases released into the atmosphere that must be dramatically reduced to avert a climate change crisis. The cap-and-trade program will be at the core of Japan's domestic systems to reduce greenhouse gas emissions, so it would be inadequate if this program were to permit a rise in total emissions due to increased production, even if efficiency improved.

Some argue that imposing a mandatory reduction in total emissions would restrict production at factories that manufacture energy-efficient products, and thus become a hindrance to their greater popularity.

Mandatory reductions in total emissions, however, do not actually place restrictions on factory production volumes. It is possible to increase production while reducing CO<sub>2</sub> emissions, by improving production lines and by improving the operating efficiencies of utility equipment, such as air conditioning and lighting. In fact, a substantial number of Japanese corporate groups are aiming to do exactly that.

Furthermore, if a given enterprise were unable to fulfill its emissions reductions obligation using its own energy efficiency measures because of a sudden increase in demand, for example, it could also increase its emissions quota by purchasing credits under the emissions trading system. In this sense as well, reductions imposed on total emissions do not place upper limits on production volumes.

On the contrary, the introduction of robust greenhouse gas emission reduction measures starting with a cap-and-trade program will expand the demand for energy-efficient products and enhance business opportunities for firms manufacturing highly efficient, energy-conserving products.

A cap-and-trade system without a reduction in total emissions would not be worthy of the name, since it would impose no cap on emissions, and would not be recognized internationally as a cap-and-trade system.

### **Proposal 2: Use the Direct Emissions Method to Count Total Emissions from Thermal Power Plants**

Japan has been employing the indirect emissions method to count CO<sub>2</sub> emissions from electricity generation at thermal power plants. This method counts emissions as coming from the business establishments, homes and other

entities that use the electricity produced.

Efforts in electricity-consuming sectors are important to advance CO<sub>2</sub> emissions reductions, so the cap-and-trade program initiated by TMG uses the indirect emissions method because that program mostly covers urban energy demand.

Nevertheless, if cap-and-trade is to be introduced as a national program, the direct emissions method should be adopted because a national system will cover all thermal power plants, which are Japan's top emissions source. Using the direct emissions method would make it possible to establish a national system that covers a high percentage of all domestic emissions, even if this method is only applied to the comparatively small number of power plants. Adopting the direct emissions method would also extend the effects of the cap-and-trade program to cover the energy used by electric vehicles, which are expected to become popular in the coming years.

### **Proposal 3: Design the Program Cover Actual Businesses Establishments, Rather than Business Entities**

An effective cap-and-trade program would require accurate measurements of greenhouse gas emissions and emissions reductions from the subject facilities, and a means for third-party verification. Correct data on emissions and emissions reductions are critical for the proper administration of a system that imposes penalties for failing to meet mandatory emissions reductions and places economic value on surplus reductions.

Because Japan's amended Act on the Rational Use of Energy (commonly referred to as the Energy Conservation Act) requires reporting by business entities in addition to the prior reporting by individual facility, some have suggested that the cap-and-trade system should also measure emissions at the level of the business entity (i.e., one corporation or business entity may have numerous individual locations or facilities).

However, such reporting would require business entities to include the emissions from all their small business facilities and stores including those in rented premises. In Japan, it is not unusual for business entities such as franchises and other chains to have 10,000 or more stores nationwide. In such cases, it would be difficult for a third party to verify whether a business entity had exhaustively and accurately calculated the emissions from all company facilities. Moreover, in many cases the energy consumption of individual stores that are tenants in rental buildings are not even measured.

Individual business facilities should therefore be the unit of measurement for emissions and to facilitate third-party verification, not just for the Energy Conservation Act—which only requires business entities to make efforts toward more rational energy use—but all the more so for a cap-and-trade system that will impose mandatory reductions in total emissions.

### **Proposal 4: Create a Program with an Active Role for the National as well as Local Governments**

At the national level in Japan, there has been slow progress with the introduction of measures to deal with emissions from large business establishments. In contrast, there has been much more rapid progress by prefectures and cities designated by government ordinance (19 cities in Japan, as of April 2010, with populations of 500,000 or greater and with special designation by the national government). A total of 33 prefectures and designated cities have introduced reporting systems (including Tokyo's system) for large establishments that are required to reduce total emissions. Approximately 15,000 facilities nationwide are designated business establishments (business premises) under the Energy Conservation Act, and about 10,000 of these facilities fall under systems run by prefectures and

designated cities.

Efforts by the central government alone will not be sufficient to achieve large reductions in greenhouse gas emissions by 2020, so it is important that both national and local governments actively fulfill their respective roles.

Under the Energy Conservation Act and the Act on Promotion of Global Warming Countermeasures, business establishments in Japan submit reports directly to the district offices of the national government, but that data is not provided to local government bodies. This system whereby regional organs of the national government have exclusive access to data from as many as 15,000 business establishments runs contrary to the trend toward the decentralization of power to local governments, and undermines the effectiveness of policies and measures.

Thus, along with the introduction of a national cap-and-trade program, existing legislation and regulations should be revised and more effective coordination should be encouraged between the national and local governments.

## **2. Promoting Low-Carbon Buildings**

Energy consumption in buildings reportedly accounts for as much as 40% of total global energy consumption, so realizing low-carbon buildings will be especially important in achieving large future reductions in CO<sub>2</sub> emissions. Also, considering that the buildings constructed today will exist for more than 30 years (the present average life of structures), the energy performance of the buildings being constructed today will have a huge impact on the achievement of both the medium-term emissions reductions goals for 2020 and the long-term goals for 2050.

As the governing body of a major metropolitan area TMG has developed a series of green building policies as core policies for the formation of a low-carbon city. The following proposals are based on Tokyo's achievements to date toward the promotion of low-carbon buildings.

### **Proposal 1: Define Energy Performance as a Basic Performance Standard for Buildings**

The most important measure to greatly improve the energy efficiency of buildings is to clearly define energy performance as a basic standard of performance for all buildings, similar to earthquake resistance, fire resistance and other safety performance standards.

Because the cumulative energy consumption and CO<sub>2</sub> emissions from individual buildings has a large impact on the global environment, there is a public or societal dimension to building energy performance, even for private-sector buildings. The construction of buildings that do not meet minimum energy performance standards can no longer be permitted in this era of a growing threat of climate change.

To those ends, provisions requiring that new buildings comply with energy standards should be added to the Building Standards Act, and amendments made as needed for linkages with other building standards.

Under the 2008 amendment to the Energy Conservation Act, the central government gained the authority to issue instructions specifying improvements when building energy conservation measures are "extremely inadequate" compared with energy efficiency standards, and to publicize noncompliance, to issue orders, and to impose penalties when those instructions are not observed. The legislation penalizes but does not prohibit these buildings, however. This approach does not send a clear message to building owners and users in general.

Energy performance standards are linked with building regulations in Germany, the United Kingdom and other European Union countries, in building codes in U.S. states, and also in South Korea, with regulations that prohibit the construction or use of buildings that do not meet specified standards.

Japan should do the same by immediately moving to recognize energy performance as a basic standard for buildings, and introduce these types of provisions into legislation.

### **Proposal 2: Raise the Energy Efficiency Standards for New Buildings, and Give Local Governments Discretionary Power to Set Standards**

Japan's current building and housing energy efficiency standards<sup>1</sup> are from 1999, and are now greatly surpassed in many cases. The standards set by TMG apply to large buildings with total floor space exceeding 10,000 m<sup>2</sup>. As

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<sup>1</sup> "Judgment Criteria of the Building Owner concerning the Rational Use of Energy related to Buildings," and "Judgment Criteria of the Building Owner and the Designated Building owner concerning the Rational Use of Energy related to Housing."

shown in Figure 1, 72% of non-residential buildings now exceed the thermal insulation standards by at least 10%, while 91% exceed the energy efficiency standards for equipment. These energy efficiency standards for buildings should immediately be updated, given the urgent demand for further performance improvements.

When the Tokyo Metropolitan Ordinance on Environmental Preservation was revised in fiscal 2008, TMG established energy performance standards that exceed the energy efficiency standards stipulated by the Energy Conservation Act, and has been enforced these standards. Moreover, satisfying certain

energy efficiency standards was made a mandatory condition to receive building permits for buildings under various urban development programs, which account for a substantial proportion of large buildings. (The comprehensive design system halves the additional floor-area ratio).

Besides strengthening standards now, it is also important to give the development industry an early indication of the timing and extent of future revisions toward even more stringent standards. The European Union Directive on the Energy Performance of

Buildings states that all new buildings constructed starting in 2019 will have to be zero-energy buildings. The United Kingdom has presented a time scale for improved energy efficiency standards for housing, stipulating reduced emissions compared to prior standards by 25% in 2010, 44% in 2013, and zero carbon emissions in 2016. In South Korea, mandatory energy efficiency standards have applied to housing since October 2009, and the government has already indicated that these will be raised to higher green-labeling standards, showing the country's earnest efforts toward reducing national emissions.

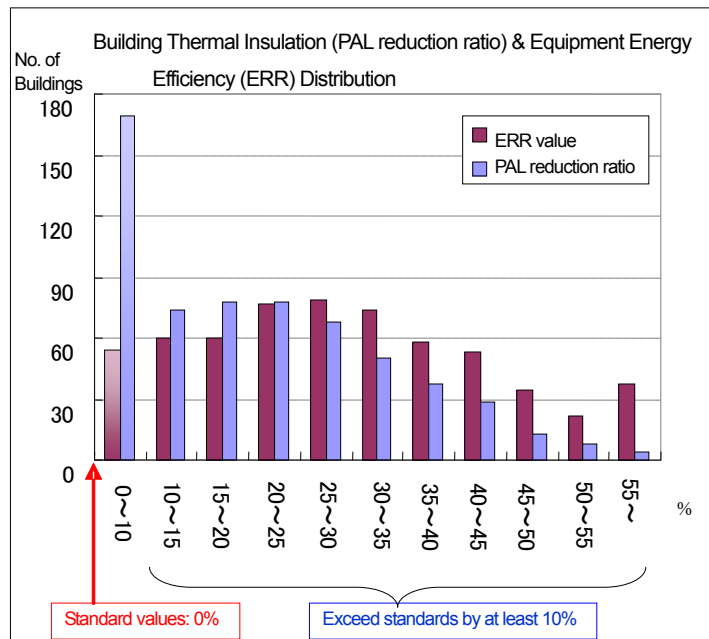
These types of systems have direct results, and implementing regulations on a national scale achieves even greater effects through the spread of technologies, technological innovation, and cost reductions. So the energy efficiency standards for new buildings must be strengthened as an urgent measure toward achieving future goals.

By their nature, standards for building energy efficiency may vary by region and climate, and the speed at which they are achieved also varies greatly by region. Consequently, to promote measures at the regional level and boost performance levels faster, the central government should recognize additional energy standards imposed at the regional level, and provide encouragement and support to regions that can quickly implement countermeasures.

### Proposal 3: Introduce Mandatory Reporting of Energy Performance

In order to dramatically improve the energy efficiency performance of buildings, it is important that buildings with good environmental performance be recognized by the market. To those ends, accurate information concerning

**Figure 1: Performance Under the Tokyo Green Building Program**  
(608 non-residential buildings from April 2002 through July 2009)



energy performance must be provided to building users, investors, architects and other concerned parties.

TMG's Green Building Program instituted in fiscal 2002 aims at providing this type of information. It will be expanded in fiscal 2010 to require the delivery of energy performance certificates (Figure 2) at the time of sale, for all non-residential buildings sold from January 2010. The green labeling program for apartment buildings was also strengthened, including the addition of an item about solar energy (Figure 3).

Many European Union countries have mandatory labeling systems for environmental performance of all buildings, including small and existing structures. The Japanese government is presently promoting the use of the Comprehensive Assessment System for Building Environmental Efficiency (CASBEE) as a tool for comprehensive evaluation of the environmental performance of buildings, and is working now to revise its grading levels. Regardless, the most important thing is to make performance labeling mandatory.

TMG's labeling system for energy efficiency of home electronics was expanded into a national labeling system. The time has come to develop a national mandatory labeling system for buildings as well. Using the European Union and Tokyo systems as references, the performance evaluation should focus on building energy efficiency and carbon emissions, and require display of energy performance certificates during building sales and other transactions. Systems design should be initiated to make such display of energy performance certificates compulsory immediately for new large buildings, and compulsory in the near future for all structures, including existing and smaller buildings.

Figure 2: Energy Efficiency Performance Evaluation Certificate

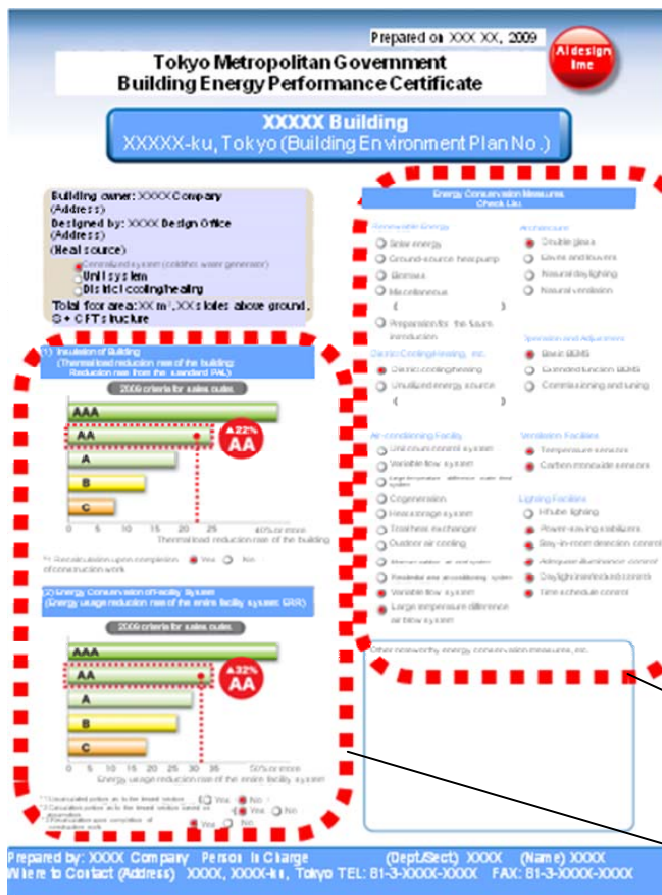


Figure 3: TMG Green Labeling Program for Apartment Buildings



Energy conservation measures labeling

Energy performance labeling

### 3. Introducing Fuel Efficiency Regulations to Reduce Total Greenhouse Gas Emissions from Motor Vehicles

In Japan, fuel efficiency targets are specified for each gross vehicle weight rating category based on the Energy Conservation Act, and efforts are being made to boost fuel efficiency. These fuel efficiency targets have been gradually increased, and new standards are now being considered for 2020.

To reduce greenhouse gas emissions from motor vehicles, TMG asked the national government to strengthen measures particularly for passenger cars—which account for a large percentage of total CO<sub>2</sub> emissions from motor vehicles in Tokyo—and requested that the government introduce average fuel economy regulations already being used in Europe and North America.

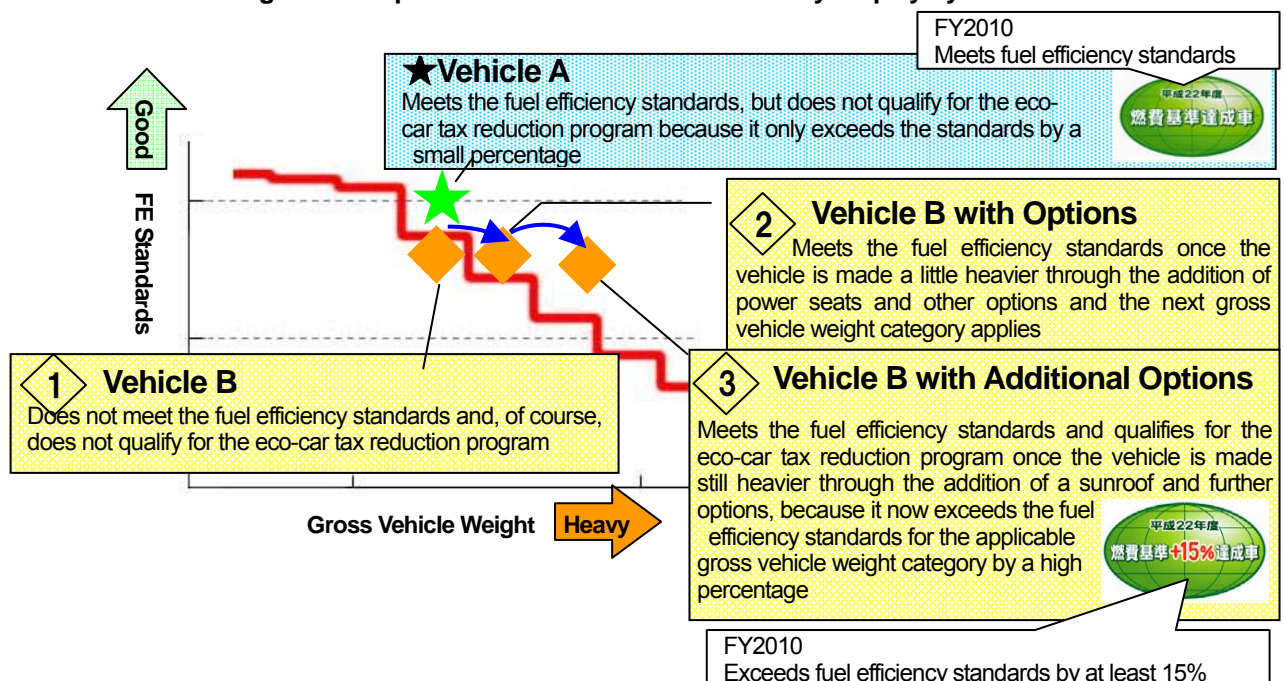
The following proposals are presented for a new fuel efficiency system that will effectively reduce CO<sub>2</sub> emissions from motor vehicles, toward realizing the large reduction in greenhouse gas emissions sought within Japan.

#### Proposal 1: Revise the Categories of Gross Vehicle Weight to Address Flaws in Methods to Calculate Fuel Efficiency

Japan's current fuel efficiency system sets fuel efficiency targets for each gross vehicle weight category. These target values decline in stages as vehicle weight increases. For that reason, a slight addition of weight to a vehicle that is nearly heavy enough for the next category effectively lowers the fuel efficiency target to be achieved by one level. This has caused the problem whereby apparent fuel efficiency ratings improve from just increasing vehicle weight, without any actual improvement in performance (Figure 4).

To address this problem, the number of categories of gross vehicle weight for the fuel efficiency targets is being increased from nine under the 2010 standards to 16 in 2015, but that does not constitute a fundamental solution. Japan should achieve drastic reforms by introducing a system like those used in Western countries, with a linear relationship between vehicle weight and fuel standards.

Figure 4: Loopholes in the Present Fuel Efficiency Display System



Vehicle A has better fuel efficiency than Vehicle B, which comes with installed options, but on the sticker Vehicle A can only be identified as meeting the fuel efficiency targets and it is not eligible for the eco-car tax reduction program.

### **Proposal 2: Improve Total Fuel Efficiency of Motor Vehicles (Including Their Electrical and Electronic Equipment)**

Air conditioning, car navigation systems and other electrical and electronic equipment have become essential standard equipment on motor vehicles today. Drivers know that fuel efficiency declines when air conditioners and other equipment are turned on. Studies have reported that fuel efficiency declines by more than 10% when air conditioners are used.

#### **Reference: Sample Fuel Efficiency Impact from Air Conditioner Use**

Impacts of car air conditioners on gasoline-powered vehicles (selected studies)

- “Air conditioning use lowered fuel efficiency by about 12% with an external air temperature of 25 degrees Celsius.” – *Ten Tips for Eco-Driving*, Eco-drive Promotion Liaison Committee (National Police Agency; Ministry of Economy, Trade and Industry; Ministry of Land, Infrastructure, Transport and Tourism; Ministry of the Environment); October 2006.
- “Running air conditioning while driving reduced fuel efficiency by 15% to 20%, even on days without sunshine.”—Research publication by Noda, Yamamoto and Sato, National Traffic Safety and Environment Laboratory; fiscal 2003.

Methods used to evaluate fuel efficiency currently assess only the performance of the actual vehicle, however, and do not count the energy consumed by such electrical and electronic equipment. Thus, the impacts on fuel efficiency (and therefore, CO2 emissions) are therefore overlooked, as is the energy efficiency of air conditioners and other equipment.

This failure to consider the fuel efficiency impact from equipment that is now nearly standard means that the present methods fail to accurately reflect the actual fuel efficiency, and also fail to provide any incentive for electrical and electronic equipment manufacturers to improve energy efficiency and use their technological capabilities to boost fuel efficiency.

Consequently, TMG proposes that Japan’s standards evaluate fuel efficiency in a way that also counts the use of electrical and electronic equipment, as is already done in Europe and North America.

### **Proposal 3: Set Fuel Efficiency Targets for the Automobile Manufacturing Industry Overall, and Announce the Average Fuel Efficiencies for Vehicles Produced and Sold by Each Automaker**

In Japan fuel efficiency targets are presently set for each vehicle model, and vehicles that do not satisfy fuel efficiency targets in a given gross vehicle weight category can be offset by vehicles that do in another. Japan presently sets no fuel efficiency targets to be achieved by each automaker overall.

For that reason, even when fuel efficiency targets are met by vehicles in each gross vehicle weight category, overall fuel efficiency may not improve if models become larger and heavier. We propose that the government should specify targets to be achieved for all vehicles sold in Japan or for each automaker, and that the average fuel

efficiencies of cars produced and sold by each automaker should be displayed for proper evaluation of their CO2 reduction efforts. This will create a system whereby the fuel efficiency of all vehicles produced by each Japanese automaker will improve, the fuel efficiency of all vehicles sold in Japan will improve, and the total CO2 emissions of the automobile sector will decline without fail.

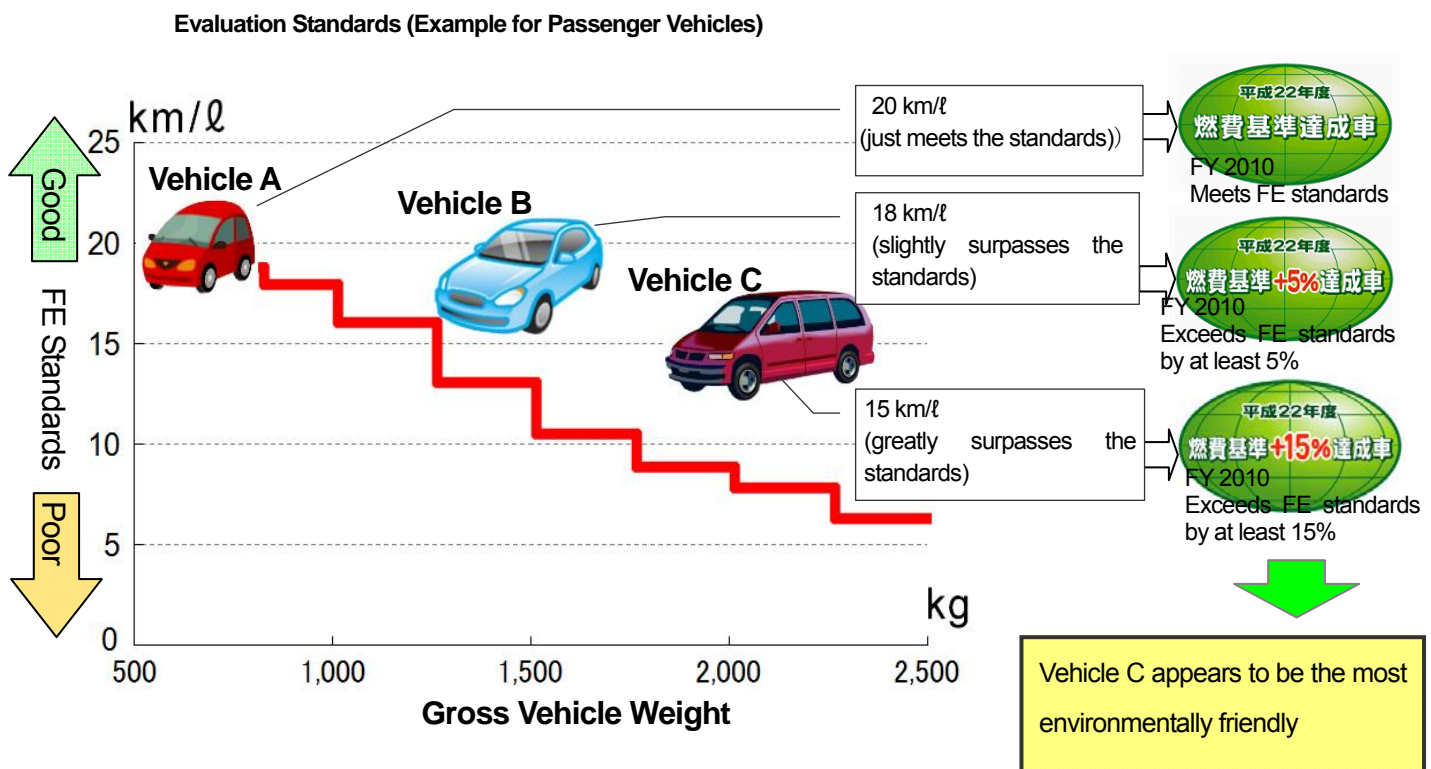
■ **Reform of the Eco-car Tax Reduction Program**

Vehicles are eligible for eco-car tax reductions when their fuel efficiency is at least 15% above the fuel efficiency target for their gross vehicle weight category (Figure 5).



Because of the problems noted in Proposals 1 and 2, however, under the current fuel efficiency standards a vehicle may become eligible for certification as an eco-car with no real improvement in fuel efficiency by simply adding options that increase weight, even when this actually worsens fuel efficiency. To correct this, the fuel efficiency system should be reformed and the eco-car tax reduction system revised in conjunction.

Figure 5: Problems with the Existing Fuel Efficiency Display System: Eco-car Tax reduction and Subsidy



Note: FE = fuel efficiency

#### 4. Dramatically Increasing the Use of Renewable Energy

To advance the wider use of renewable energy, TMG has worked to promote the broader adoption of solar energy, including solar heat, as well as linkages to regions with abundant natural energy sources, and the development of wave power generation and other new technologies. In this process, we have held discussions with companies, business organizations, expert researchers, NGOs and other bodies regarding the renewable energy policies that should be advanced in Japan.

The proposals here focus on measures that should be strengthened on a particularly urgent basis, for the time being.

##### Proposal 1: Expand the Use of Solar Heating Equipment

Japan's solar photovoltaic power generation market has begun rapidly expanding. The national government, TMG, prefectures and local governments have established subsidy systems, and a new system for the purchase of surplus electricity was introduced in November 2009.

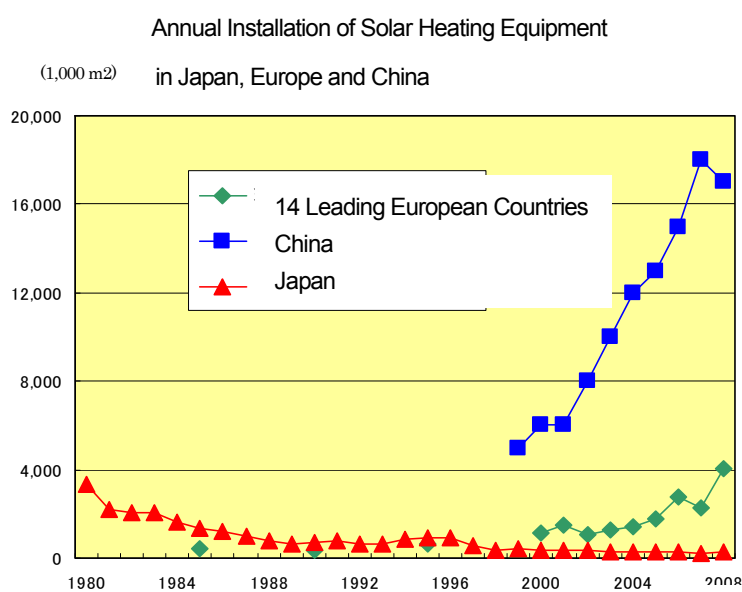
On the other hand, Japan's solar thermal market has long remained stagnant, in part because the superior environmental performance of solar thermal technology is not widely recognized in Japan. This stands in sharp contrast with the developments overseas. China is introducing solar heating on a large scale, equivalent to five million solar water heaters per year, while the markets in Germany and other European Union countries are also rapidly expanding.

The CO2 emissions reductions per unit of area from solar heating equipment are several times greater than those from photovoltaic power generation. The wider use of solar heating is essential to cover 10% of Japan's primary energy supply with renewable energy by 2020.

The national government should implement a full-scale subsidy system to promote the use of solar heating equipment, boost recognition of solar heating using green heating certificates and government publicity, and otherwise implement measures to expand the overall use of solar heating.

##### Proposal 2: Establish a National Certification System for Photovoltaic Power Generation Equipment Installers

The environment is now being discussed as one field with the potential for expanded employment. In particular, the photovoltaic power generation market is expected to rapidly expand and play a role in employment growth, with



Compiled by the Tokyo Metropolitan Government Environment Bureau from *Solar Thermal Markets in Europe, Trends and Market Statistics* and *Sun in Action II - A Solar Thermal Strategy for Europe, Volume 1* (European Solar Thermal Industry Federation); *China Statistical Yearbook*; and Solar System Development Association materials.

one factor being a growing number of market entrants from different industries.

This past year, however, the media have begun to report on problems related to installation work for photovoltaic power generation systems. While a worker making an installation is required to have a Class 2 electrician certification, an electrician's knowledge alone is not all that is required to properly install these systems on rooftops, several meters above the ground. This work demands sufficient knowledge about roofs and tile surfaces, the structural design below roofs, and other fields of expertise, as well as advanced installation skills and work safety.

At present, manufacturers conduct their own training and awarding certifications to individuals who complete their courses. To prevent roof leaks and other problems, the central government should specify standards for the installation of photovoltaic power generation equipment, establish a national certification system, and otherwise work to improve the quality of installation work for photovoltaic power generation equipment.

### **Proposal 3: Recognize Wave Power Electricity Generation under the Act on the Promotion of New Energy Usage**

Japan's exclusive economic zone is five times larger than China's and the sixth largest on Earth. Overseas, the governments of countries bordering the ocean are providing economic support for development and introduction of wave power and other forms of energy from the oceans. In Japan, government support for the introduction of wave-activated power generation is presently difficult because it is not officially recognized as a new form of energy. Accordingly, the national government should implement the following measures.

- i. Add electricity from wave power as a new energy under the Act on the Promotion of New Energy Usage, recognize wave energy in national energy policy legislation, and work to develop and use this form of energy.
- ii. Incorporate wave power generation into Japan's Basic Plan on Ocean Policy.
- iii. Promote offshore demonstration testing, model power generation projects, and infrastructure improvements such as the installation of submarine cables.
- iv. With future technological developments in mind, develop supportive policies, including the addition of electricity produced using wave power generation to the feed-in tariff program.

### 5. New System to Promote Reduction of CO2 Emissions from Plastics

#### —Framework to Push CO2 Emissions Reductions through the Three Rs

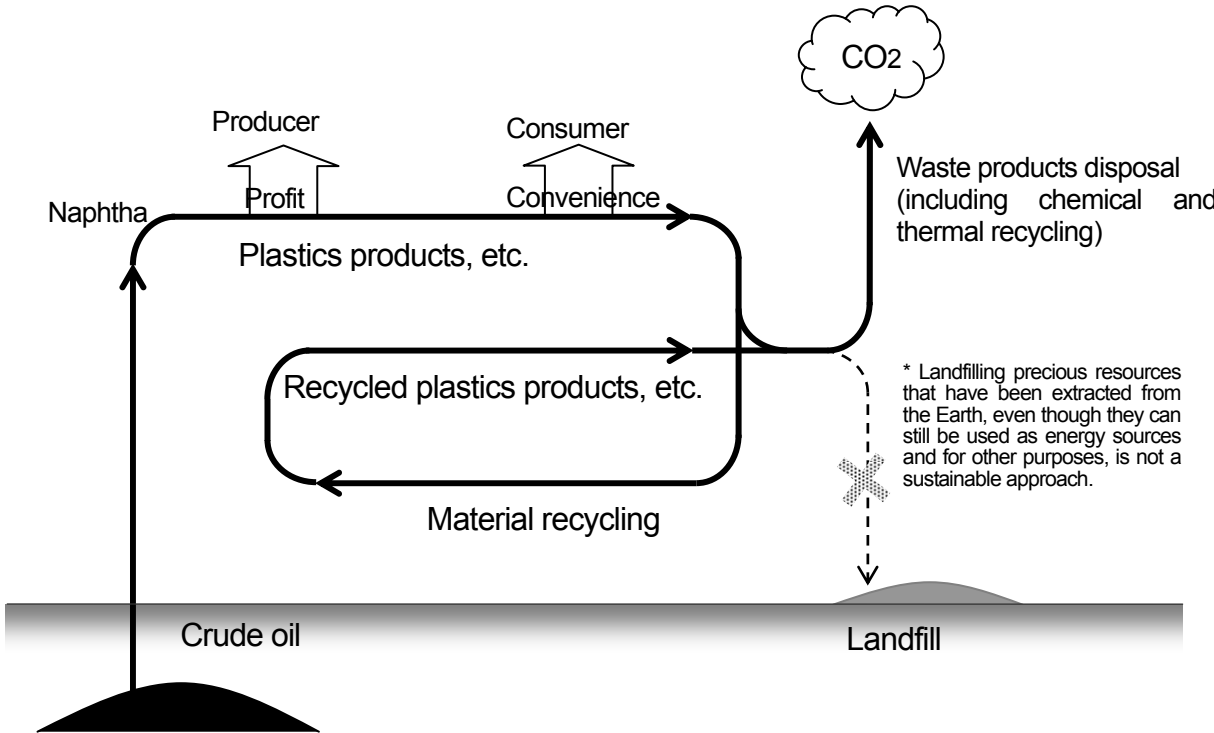
Some 20 million tons of CO2 originating from plastics are released each year from the chemical recycling (feedstock recycling), thermal recycling (energy recovery), and incineration without energy recovery.

To advance significant reductions in these CO2 emissions from plastics, it is important, first of all, to reduce the actual volume of plastics being used and also to achieve effective utilization of used plastics right through to the end of their useful life. In other words, we must advance reuse and recycling as a matter of course, and conduct chemical and thermal recycling of items that are not suitable for material recycling.

Under the current greenhouse gas calculation, reporting and disclosure systems based on Law Concerning the Promotion of the Measures to Cope with Global Warming, CO2 emissions from plastics ultimately subjected to chemical and thermal recycling are counted as emissions by the recycler, resulting in these problems:

- failure to properly recognize reductions in the use of the ingredients of plastics, or the expanded use of recycled plastics from mechanical recycling.
- failure to properly recognize reductions in greenhouse gas emissions due to chemical and thermal recycling, ultimately encouraging landfilling rather than the effective use of natural resources.

Plastics Life Cycle and CO2 Emissions from Plastics



To realize significant reductions in CO2 emissions associated with plastics, it is necessary to promote (1) absolute reductions, (2) shifts to biomass and other materials, and (3) the use of recycled plastics in product manufacturing and at other stages.

To those ends, greenhouse gas calculation, reporting and disclosure systems currently used should be revised in line with the concept of extended producer responsibility, and further efforts by manufacturers and importers should be promoted by introducing a system that calculates CO2 emissions from plastics at the manufacturing and import

stages of products that contain plastics.

Specifically, we propose a system as outlined below.

### **Proposal 1: Calculate CO2 Emissions from Plastics based on Extended Producer Responsibility<sup>2</sup>**

The system should calculate CO2 emissions from plastics at the stage when the plastics products are manufactured or imported as detailed below, rather than at the stage of direct emissions, under the Extended Producer Responsibility (EPR) concept.

- Require manufacturers and importers of products containing plastics<sup>3</sup> to calculate and report CO2 emissions from plastics.
- Calculate CO2 emissions from plastics by multiplying emission coefficients (stipulated separately) by the volumes of each type of plastics contained in the products.
- Exclude recycled plastics<sup>4</sup> and bioplastics<sup>5</sup> from the calculations.

### **Proposal 2: Devise Ways to Evaluate Manufacturers' Efforts**

Efforts to reduce CO2 emissions from plastics by switching over to recycled plastics and biomass materials should be properly recognized. The government should consider and introduce a framework that provides economic incentives to business entities that make reduction efforts.

### **Proposal 3: Properly Evaluate Chemical and Thermal Recycling**

Businesses should be required to calculate and report the direct emissions from chemical recycling, thermal recycling and incineration without energy recovery as reference values.

Under the present system, calculations of emissions cannot be adjusted downward if heat and electricity generated from thermal recycling is supplied to external users. This limitation is not reasonable. The system should be changed to permit deductions of the equivalent CO2 emissions for electricity and heat supplied externally, in an effort to promote greater thermal efficiency.

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<sup>2</sup> The OECD defines “extended producer responsibility” (EPR) as an environmental policy approach in which a producer’s responsibility for a product is extended to the post-consumer stage of a product’s life cycle.

<sup>3</sup> Including manufacturers using plastic containers and packaging; limited to those with CO2 emissions of at least 3,000 tons per year originating from plastics.

<sup>4</sup> Limited to plastics recycled from used products, etc.

<sup>5</sup> Standards determining the range of applicable bioplastics should be specified, considering sustainability standards for biofuels.

## **V. Further Expanding Tokyo's Climate Change Efforts**

To reach the greenhouse gas emission reduction target set for the year 2020, and prepare for the deeper reductions targeted for 2050, it will be necessary to strengthen measures in every sector, and to transform Tokyo into a low-carbon city. These efforts will not only spur the development of new environmental businesses, but will also allow Tokyo to achieve sustainable growth. In conjunction with the pioneering activities by other local and sub-national governments throughout Japan and the world, Tokyo's efforts will also make a contribution to global progress in measures to confront the climate change crisis.

### **1. Creating Sustainable Growth in Tokyo Through Climate Change Strategies**

The strengthening of Tokyo's global warming measures since 2007 has helped bring a new vitality to the renewable energy industry, and has also contributed to expanding business opportunities related to energy conservation. In addition, there are many cases where the CO<sub>2</sub> emission reduction measures instituted at business facilities have resulted in the additional benefit of reduced energy costs.

As the Tokyo Metropolitan Government (TMG) pursues enhanced measures aimed at achieving the 2020 emission reduction targets and the deeper emissions cuts thereafter, increased synergies with commercial and industrial strategies will be sought, in order to ensure that future activities will also improve Tokyo's economic vitality and lead to sustainable growth. These efforts will include the following:

- Clarifying the economic effects of Tokyo's climate change responses
- Promoting the development of energy-saving technologies through collaboration with Tokyo Metropolitan University, various research institutions of TMG, and others
- Promoting the diffusion of energy-saving and renewable energy technologies available through Tokyo's businesses

### **2. Transforming Tokyo into a Low-Carbon City**

With the establishment in 2002 of the Tokyo Green Building Program, and its progressive strengthening since then, including this year's launch of a system for regional energy-efficiency planning, TMG has stepped up its efforts to achieve low-carbon urban development within Tokyo, starting with individual buildings and reaching out to the community. We will further accelerate and expand our activities to transform Tokyo into a low-carbon city, promoting effective coordination with strategies addressing urban planning, urban infrastructure development, urban transportation, housing, waste management, and other fields. These efforts will include the following:

- Promoting reductions in carbon emissions through energy conservation measures for buildings, including for existing structures
- Reducing the over-reliance on automobiles
- Pursuing the establishment of district heating networks as a CO<sub>2</sub> emission reduction measure
- Assessing urban energy sourcing options

### **3. Analysis of Climate Change Impacts on Tokyo**

The longer there is a delay in establishing an international framework for significantly reducing greenhouse gas

emissions, the more the impacts of climate change are certain to grow. In order to reduce the risks associated with climate change in Tokyo, and to undertake appropriate responses to climate change impacts, it is necessary to gain an understanding of what the impacts of climate change will be, and to conduct research and analyses tailored to Tokyo's particular circumstances. With this goal in mind, since fiscal 2009 TMG has been collaborating with relevant ministries and research institutions to advance studies concerning the impacts of climate change on the Tokyo region; this is the first effort by a local government in Japan to conduct detailed climate change impact studies at a regional scale. Through these studies, detailed projections and assessments will be undertaken concerning the impacts of climate change in a variety of fields, including natural disasters, food production, water resources, and health. These efforts will include the following:

- Climate change impact research (begun in fiscal 2009) conducted over a three-year period ending in fiscal 2011
- Research in collaboration with related ministries and research institutions so that Japan's latest national climate change assessments can be used in the IPCC Fifth Assessment Report

#### **4. Efforts at Tokyo Metropolitan Government Facilities**

The Tokyo Metropolitan Government, with all of its facilities, is itself one of Tokyo's largest emitters of CO<sub>2</sub>, with annual emissions of approximately 2.08 million tons. So far, under the Global Warming Prevention TMG Plan (which established the target of a 10-percent reduction by 2009 compared to the fiscal 2004 baseline for overall greenhouse gas emissions associated with governmental operations), an 8.4% reduction in emissions has been achieved through energy service company (ESCO) projects, high-temperature incineration of sewage sludge, installing solar power generation equipment at water treatment plants, and other measures. To set an example for the private sector, we will continue to undertake enhanced measures, including introducing energy-saving ideas and utilizing renewable energy. These efforts will include the following:

- Preparation of a revised Global Warming Prevention TMG Plan during fiscal 2010, with a stricter target for emission reductions by fiscal 2014, and clarification of strategies for achieving this goal
- During the first emission reduction period under the Tokyo Cap-and-Trade Program (fiscal 2010–2014), measures at the main Tokyo Metropolitan Government Building in Shinjuku to “fine-tune” energy efficiency (i.e., by refining procedures for the operation of equipment) and to encourage energy-conserving work styles (i.e., by making work styles more energy-efficient); during the second emission reduction period (fiscal 2015–2019), in the process of scheduled replacement of equipment, installation of highly energy-efficient equipment to further boost energy efficiency and allow TMG to achieve its obligations to reduce emissions

#### **5. Networking with Leading Companies, NGOs, and Experts**

In the process of putting the Tokyo Climate Change Strategy into operation, TMG has established a network with a variety of actors—including leading companies and industry organizations, environmental NGOs, think tanks, and academics—that are pioneering efforts to mitigate the climate crisis.

This network will serve as the foundation for further progress on Tokyo's climate change strategies, and Tokyo's pioneering efforts are expected to serve as a basis for efforts across Japan. In the future, we will continue to strengthen our collaboration with visionary companies, NGOs, and experts. These efforts will include the

following:

- Holding symposiums and workshops taking advantage of effective opportunities
- Establishing agreements for cooperation with corporations and industry organizations

## **6. Collaboration with Other Local Governments in the Tokyo Metropolitan Area and Nationwide**

Efforts by Japan's national government alone will not achieve the significant CO2 reduction targets set for 2020 and 2050; it will be essential for local governments to also play a central role. TMG will contribute to the advancement of global warming measures by other local governments, both within the Tokyo Metropolitan Area and nationwide, through actively sharing the experiences and expertise gained as a result of our pioneering measures related to commercial and industrial sectors, environmentally friendly urban planning, expanded use of renewable energy and other measures. These efforts will include the following:

- Holding policy seminars for representatives of other prefectures and major cities (designated by ordinance)
- Strengthening cooperation with prefectural governments throughout Japan working to expand the supply and utilization of renewable energy sources
- Collaborating with progressive local governments in the Tokyo Metropolitan Area, with the aim of introducing a cap-and-trade program with them

## **7. Collaboration with Sub-National Governments Worldwide**

Just as Tokyo is taking a leading role on climate initiatives within Japan, other sub-national governments are taking leading roles within their own countries; these include the states of New York and California in the United States, and the provinces of British Columbia and Quebec in Canada. Tokyo is already cooperating with these and other state or provincial governments through the framework of the International Carbon Action Partnership (ICAP).

In addition to its ongoing collaboration with other cities, TMG will strengthen its cooperation with other sub-national governments in order to contribute to enhanced climate change efforts globally. These efforts will include the following:

- Coordination with other sub-national governments worldwide through the Club of 20 Regions (R20)
- Strengthening cooperation with Seoul and other civic governments in Asia
- Collaboration with cities throughout the world, including through the C40 Cities Climate Leadership Group and ICLEI - Local Governments for Sustainability