Tokyo Cap-and-Trade Program:

Japan's first mandatory emissions trading scheme

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Bureau of the Environment
Tokyo Metropolitan Government

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1 Introduction

Since announcing its Tokyo Climate Change Strategy [i] in June 2007, the Tokyo Metropolitan Government (TMG) has been examining ways to bolster the fight against global warming. Based on a year-long intensive study, the Governor of Tokyo, Shintaro Ishihara, submitted a bill to the second regular meeting of the Tokyo Metropolitan Assembly in June 2008 that introduced mandatory targets for reductions in overall greenhouse gas emissions for large-scale emitters as part of an emissions trading program. The Tokyo Metropolitan Assembly passed the bill, thus introducing Japan's first cap-and-trade emissions trading program, to take effect in fiscal 2010.

TMG has developed a cap-and-trade program that many advanced nations and regions are also moving to implement since the first introduction of such a scheme by the European Union in 2005. TMG's program is the first one to be implemented in Japan and Asia.

In March 2009, TMG set the cap for the first compliance period (fiscal 2010 to fiscal 2014). This aims to reduce total emissions among the capped sectors by 6% from the base-year emissions.

In addition, the prospective cap in the second compliance period (fiscal 2015 to fiscal 2019) has been announced to be even stricter, aiming for a 17% reduction from the base-year emissions.

Based on this achievement of the introduction of its cap-and-trade program, TMG became Asia's first official ICAP member on May 26, 2009. TMG will remain the most powerful driving force in Japan for the establishment of a carbon market as our commitment to fighting climate change continues.

1.1 Significance of Tokyo's introduction of a cap - and- trade Program

The Tokyo Metropolitan Government considers the introduction of its Tokyo Cap-and-Trade Program to be significant for the following two reasons.

1.1.1 Tokyo Metropolitan Government leadership in Japan is essential in dealing with climate change

Greenhouse gas emissions in Tokyo total 59.6 million tons per year. This volume is comparable to the national emissions of some Scandinavian countries such as Denmark or Norway. The emissions in Tokyo are therefore significant.
Besides the amount of emissions, the significance of the introduction of the program is even clearer when the role that Tokyo plays in Japan is taken into consideration.
Tokyo is the capital of Japan and the country's political, economic and cultural functions are centered on this city.
Tokyo is one of the world's largest cities, ranking in size with New York, London and a few other major cities. The Tokyo Metropolitan Government is not merely a municipal government; it is an administrative organization that covers a very large area consisting of 62 smaller municipalities, including cities, towns, and villages, collectively called *shi-cho-son*. Indeed, TMG is the largest sub-national government in Japan serving a population of approximately 13 million.

Over 50 percent of the listed companies on the Tokyo Stock Exchange are located in Tokyo. Gross production in Tokyo was 900 billon US dollars in fiscal 2005. This figure accounted for approximately 20% of Japan's gross domestic product (GDP).

The Tokyo Cap-and-Trade Program will therefore be introduced directly into the heart of Japan's largest economic center, which is at the same time the heart of the Japanese economy. Almost all major skyscrapers in Tokyo come under the scope of the cap. Many legislative and administrative organs of the central government, such as the Prime Minister's official residence, the Diet Building, the Ministry of the Environment, the Ministry of Economy, Trade and Industry are also under the cap.

The impact that the introduction of the Tokyo Cap-and-Trade Program will have on Japanese measures to deal with climate change, however, is even greater than its share of the national economy. Since its battle against factory pollution in the 1960s, Tokyo has remained constantly at the leading edge of environmental administration in Japan.[ii]

In a recent case, measures against diesel auto emissions that TMG launched in 2003 have transformed policy on automobile pollution in Japan.[iii]

The (scheduled) introduction of the Tokyo Cap-and-Trade Program is having a great impact on domestic public opinion due to the achievements that TMG has already gained with regard to its environmental actions. Major media organizations in Japan such as the Nihon Keizai Shimbun and Asahi Shimbun are urging the central government to follow in the footsteps of TMG in this area.

It is extremely significant for Tokyo, a city with many buildings that are conspicuously increasing their CO_2 emissions, to stand at the forefront of reductions. Business facilities should rack their brains at this point to achieve their targets… We believe the Tokyo Metropolitan Government's attempt has many aspects that the central government can use as a reference for national policies. Local governments might also follow in the footsteps of the Metropolitan Government, and oblige business facilities to reduce emissions. We would like to see Tokyo's pioneering attempt in Japan transformed into a trigger for further Japanese measures against global warming. (*Asahi Shimbun* editorial, July 30, 2008)

With its now skeptical view of the central government's role, the Tokyo Metropolitan Government will go ahead with obligating large-scale business facilities in Tokyo to reduce their greenhouse gas emissions in fiscal 2010, and launch an emissions trading scheme of its own in fiscal 2011. This scheme will cover large buildings in the public and private sectors and major public facilities across the board, including the Diet Building, the Prime Minister's Official Residence and Roppongi Hills… There is still opposition to the scheme in industrial circles, but the Tokyo Metropolitan Government's initiative deserves high praise. We believe the central government should treat the scheme as a reference point for its own efforts…The Tokyo Metropolitan Government plans to take part in the International Carbon Action Partnership (ICAP), a body the European Union (EU) and influential state governments in the US established for the purpose of developing a common emissions trading market.
(*Nihon Keizai Shimbun* editorial, August 31, 2008)

The Tokyo Metropolitan Government will introduce in fiscal 2010 an environmental measure that obliges large-scale business facilities to reduce their carbon dioxide (CO_2) emissions, a cause of global warming, and permits such facilities to engage in "emissions trading"…The Tokyo Metropolitan Government's attempt is sure to influence the central government, other local governments and companies… Opinions seemingly in favor of the introduction of such a scheme by the Tokyo Metropolitan Government have even appeared among corporate officials who say, "We would be confused if the central government and the Metropolitan Government enforce measures against global warming based on their own separate criteria. We would like these governments to unify their criteria."(*Mainichi Shimbun* special feature, May 25, 2008)

In addition, major companies, financial institutions and other groups in Japan are showing strong interest in this program. Progressive measures in Tokyo such as this one are continuing to have a considerable effect on measures to deal with climate change throughout Japan.

The Japanese government started the trial implementation of emissions trading in the fall of 2008. However, this trial differs from the cap-and-trade schemes that have become the most accepted approach internationally. Major problems with the national government's trial are that participation is voluntary and left entirely up to each company's decision, and that no cap has been established for sectors within the scope of the program.

As stated above, TMG has introduced a mandatory cap-and-trade program with an absolute cap. Tokyo's program clearly indicates the way to go and could play a role in counteracting the disparities inherent in the Japanese government's trial of "emissions trading without a cap".

1.1.2 The first cap-and-trade program in the world to cover facilities such as office buildings in the commercial sector

We believe the introduction of a cap-and-trade program in Tokyo is significant not only for Japan, but also for the rest of the world. The Tokyo Cap-and-Trade Program differs from that of its EU-ETS and RGGI counterparts, since it also includes within its scope the large-scale office buildings that are concentrated in large cities. Controlling CO_2 directly at the source of the emissions is essential. Initiatives taken in the European Union and the northeastern United States are effective since they target the sources of emissions, including thermal power plants.

Advanced nations face an extremely ambitious target of reducing greenhouse gas emissions by more than 80% by the middle of the 21st century. Greater control at the site of the direct sources of emissions, together with powerful reduction measures on the part of energy consumers, is indispensable in meeting this tough target.

Work needs to be done to address CO_2 emissions upstream and downstream in order to avoid the risks associated with climate change.
Based on this point of view, the Tokyo Cap-and-Trade Program is newly designed to cover facilities, such as office buildings, in the commercial sector. The Carbon Reduction Commitment (CRC), which has been introduced by the British Government, is similar to the Tokyo Cap-and-Trade Program since it is also designed to cover the commercial sector. The Tokyo Cap-and-Trade Program will be launched from April 2010, and the experience gained will be shared with many other nations and large cities around the world.

1.1.3 The role of sub-national governments in the establishment of an international carbon market

Many nations have yet to introduce a cap-and-trade scheme at the national level. Setting a precedent with the introduction of such schemes by the motivated provinces, states, and cities is highly significant since it provides evidence of the actual effects of the policy, facilitating the nationwide implementation of such schemes. In fact, California and other western states of the United States, as well as northeastern states such as New York and New Jersey, have already facilitated the

commitment of the federal government. Four Provinces in Canada, including British Columbia, are also preceding their federal government. Similarly, the Tokyo Metropolitan Government is paving the way for the commitment of the central government of Japan to the implementation of a nationwide cap-and-trade program.

This is one, but not all, of the important roles of sub-national governments in coping with climate change. For advanced nations to drastically cut their CO_2 emissions, it is of course vital to involve the entire nation in a cap-and-trade program.

If we are to forecast what should be done for fiscal 2020 and beyond to achieve a greater than zero reduction in emissions, however, it will be more effective for state governments and metropolitan governments to introduce supplementary cap-and-trade programs in addition to a single nationwide program run by the central government, so that they can also cover facilities such as offices buildings in the commercial sector. Such integrated cooperation between the central government and sub-national governments is the optimal and the only way of creating a vigorous international carbon market. Based on this understanding, the Tokyo Metropolitan Government will proceed vigorously with the implementation of the Tokyo Cap-and-Trade Program.

2 State of GHG emissions in Tokyo

2.1 Scale of Tokyo's GHG emissions from a global perspective

Approximately 59.6 million tons of greenhouse gases (GHG) were emitted in metropolitan Tokyo in FY2006. This volume ranked Tokyo between two Scandinavian countries, Sweden (28th place) and Norway (29th), in global GHG emissions for that year.

2.2 GHG emissions and energy consumption trends for Tokyo

GHG emissions in Tokyo increased approximately 3% from FY1990 to FY2006. Energy-related carbon dioxide (CO_2) accounted for about 95% of GHG emissions. CO_2 emissions in the city grew about 6% over that period. Energy consumption also expanded 10%. Comparing FY2006 levels with FY2000 levels, CO_2 emissions in Tokyo decreased by approximately 2%, and energy consumption decreased by about 4.6%.

■GHG Emissions (FY2006)

		Emissions (10,000t-CO_2eq)				Growth (%)		
		1990FY	2000FY	2005FY	2006FY	1990-2006	2000-2006	2005-2006
CO_2	Industry sector	984	680	589	536	-45.5%	-21.2%	-9.0%
	Commercial sector	1,571	1,890	2,333	2,151	36.9%	13.8%	-7.8%
	Residential sector	1,300	1,433	1,663	1,504	15.7%	5.0%	-9.6%
	Transportation sector	1,483	1,764	1,518	1,476	-0.5%	-16.3%	-2.8%
	Total energy-related CO_2	5,338	5,767	6,103	5,667	6.2%	-1.7%	-7.1%
	Total non-energy related CO_2	99	118	101	98	-1.0%	-16.9%	-3.0%
	Total CO_2	5,437	5,885	6,204	5,765	6.0%	-2.0%	-7.1%
CH_4, N_2O, HFCs, PFCs, SF_6		342	293	217	198	-42.1%	-32.4%	-8.8%
Total GHG		5,779	6,178	6,421	5,963	3.2%	-3.5%	-7.1%

■Energy Consumption (FY2006)

		Energy Consumption (PJ eq)				%		
		1990FY	2000FY	2005FY	2006FY	1990-2006	2000-2006	2005-2006
Energy Consumption (PJ)	Industry sector	129.1	96.5	80.7	76.3	-40.9%	-20.9%	-5.5%
	Commercial sector	182.6	245.2	273.4	266.2	45.8%	8.6%	-2.6%
	Residential sector	171.8	202.1	217.0	207.9	21.0%	2.9%	-4.2%
	Transportation sector	213.0	257.4	218.3	214.2	0.6%	-16.8%	-1.9%
	Total	696.4	801.3	789.4	764.6	9.8%	-4.6%	3.1%

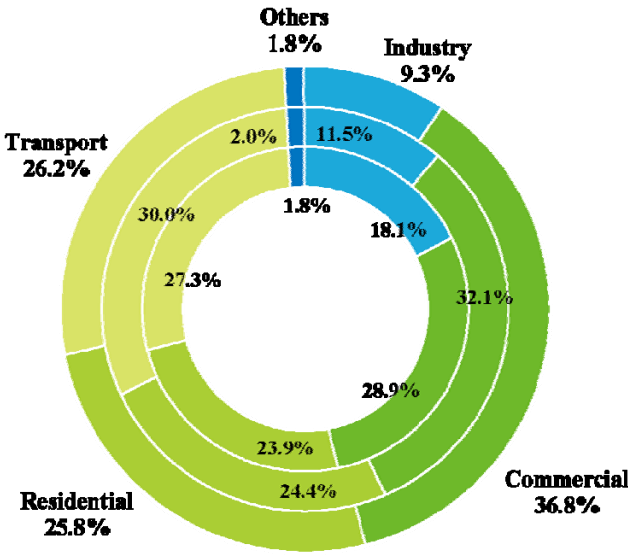
2.3 CO2 emissions trends for Tokyo by sector

CO_2 emissions grew in the commercial and residential sectors between FY1990 and FY2006, increasing 37% and 16%, respectively, for these sectors. CO_2 emissions declined slightly in the transportation sector, and declined sharply, at a rate of 46%, in the industrial sector.

The distribution shows that the commercial sector expanded its share from 29% in FY1990 to 37% in FY2006. This sector could boost its share further if current trends continue. Changes since FY2000 indicate that the proportional share has been falling for both the industrial and transportation sectors while significant growth has been continuing for the commercial and residential sectors.

In view of these trends, the Tokyo Metropolitan Government (TMG) must step up measures, particularly in the commercial and residential sectors, and work to reduce GHG production in Tokyo by combining such measures with its initiatives to take advantage of the reduction potential in other sectors.

■CO2 Emissions by sector



Inner circle: FY1990 (total 54.4milliont-CO2)
Middle circle:FY2000 (total 58.9milliont-CO2)
Outside circle:FY2006 (total 55.9milliont-CO2)

2.4 CO2 emissions rates for Tokyo by energy type

By energy type, electricity accounts for approximately 50% of CO_2 emissions in Tokyo, followed by fuel oil (28%) and city gas (17%). Changes since FY1990 show CO_2 emissions from city gas rose the sharpest (approximately 44%), which is evidently attributable primarily to the conversion to gas from fuel oil and other such factors. CO_2 emissions from the use of fuel oil, LPG and other energy sources (including coal) have all decreased by about 20%. Emissions from electricity use have grown approximately 15%, second behind city gas use.

■CO2 emissions and Energy Consumption by energy type fuel

	CO_2 Emissions (10,000 t-CO_2eq)					Energy Consumption (PJ eq)				
	FY1990	FY2000	FY2006	1990-2006	2000-2006	FY1990	FY2000	FY2006	1990-2006	2000-2006
Fuel Oil	1,960	1,934	1,547	-21.1%	-20.0%	287	285	228	-20.6%	-20.0%
LPG	206	192	147	-28.6%	-23.4%	34	32	25	-26.5%	-21.9%
Manufactured Gas	680	926	976	43.5%	5.4%	137	187	199	45.3%	6.4%
Electricity	2,460	2,696	2,817	14.5%	4.5%	233	296	313	34.3%	5.7%
Others	132	137	101	-23.5%	-26.3%	4	2	0	-100.0%	-100.0%
Total	5,437	5,885	5,588	2.8%	-5.0%	696	801	765	9.9%	-4.5%

2.5 Comparison of the characteristics of national emissions for Japan and emissions in Tokyo

Compared with the nationwide breakdown, CO_2 emissions in metropolitan Tokyo are characterized by a low rate in the industrial sector (Japan 36%, Tokyo 9%) and high rates in the residential (Japan 13%, Tokyo 26%), commercial (Japan 18%, Tokyo 37%) and transportation sectors (Japan 20%, Tokyo 26%).

Based on these characteristics, efforts in the industrial and energy conversion (production) sectors are the major initiatives in Japan, while Tokyo focuses on the commercial sector. However, emissions nationwide in the commercial sector have increased substantially since FY1990. This trend is particularly evident in Tokyo, a large city and the capital of Japan. Accordingly, the reduction of commercial sector emissions is an important target for the whole of Japan, along with further reductions in the industrial sector.

Box: “Direct emissions” and “indirect emissions”

In Japan, GHG emissions from electric power plants and the discharge of GHGs from producing heat in heating supply facilities have been commonly calculated as “indirect emissions,” a statistical category for allocating emissions to the final consumption sectors, including factories, offices and homes.

As a national measure, parties that emit considerable volumes of GHG have been required to calculate their GHG emissions and report them to the central government. This is in accordance

with the Law Concerning the Promotion of Measures to Cope with Global Warming (Global Warming Measures Law) enacted on April 1, 2006. The law specifies "CO_2 emissions resulting from fuel usage and the use of electricity and heat (CO_2 emitted as a result of fuel combustion, or the use of electricity or heat supplied by other parties)" as GHG emissions that must be calculated and reported.

In addition, the Energy Saving Law, which obligates large factories, buildings and so forth in Japan to make energy conservation efforts, requires that power and heat consumption be documented when reporting energy consumption.
Furthermore, monitoring and reporting guidelines in the Japanese Ministry of the Environment's domestic voluntary emissions control system handle GHG emissions from the use of electricity and heat as follows:

GHGs are not directly emitted by factories and other business facilities when electricity and heat supplied from outside sources are used. However, GHGs are emitted by power plants and heat-supply facilities for generating the supplied electricity and heat. For this reason, electricity and heat consumed are treated as "indirect emissions" and calculated by the user (on the demand side).

For these reasons, TMG also aggregates GHG emissions from the use of electricity and heat in the industrial, commercial, residential, and transportation sectors.

Approximately 40% of energy consumed in Tokyo is electricity. Tokyo Electric Power Company, Inc. supplies almost all the electricity consumed within the jurisdiction of TMG.. Nuclear, thermal and other power plants located outside Tokyo supply 90% of the electricity consumed in Metropolitan Tokyo.
TMG is forcefully executing measures on the energy demand side (for energy conservation and the promotion of renewable energy), based on Tokyo's characteristically large volume of energy consumption and the GHG emissions calculation methods adopted in Japan. Furthermore, TMG is adopting measures that ask energy suppliers to decrease emissions involved in power generation. The contents of such measures are described later in this document.

Box: The Carbon Reduction Commitment (CRC) in the UK

The UK Government is planning to introduce a new measure called "the "Carbon Reduction Commitment (CRC)" to reduce emissions primarily from large non-energy intensive organizations in the private and public sectors.

"Consultation on implementation proposals for the Carbon Reduction Commitment"
Department for Environment, Food and Rural Affairs UK, June 2007

The Carbon Reduction Commitment (CRC) is a mandatory cap and trade scheme covering energy use emissions from large business and public sector organizations.

The CRC will target business and public sector organizations that have annual electricity consumption from mandatory half hourly meters in excess of 6,000 megawatt-hours (MWh).

The CRC will target both direct CO_2 energy use emissions and indirect CO_2 emissions (i.e. from electricity). However, emissions that are covered under Climate Change Agreements (CCAs) and direct emissions included in the EU Emissions Trading System (EU ETS) will not be covered by CRC.

It is anticipated that the CRC will use similar emissions factors to calculate emissions to those used in the UK ETS. As in the UK ETS, a single electricity emissions factor will be used for grid-sourced electricity - it does not matter how the electricity is generated (i.e. nuclear, coal, gas or renewable generation). As recommended by the NERA / Enviros analysis, this approach maintains the scheme's focus on additional actions by the end user.

However, Government recognizes that these factors change over time, particularly for grid electricity. Accordingly, Government proposes that the factors will be updated at the start of each phase, to better reflect the actual emissions from the fuels at the start of the scheme.

http://www.defra.gov.uk/environment/climatechange/uk/business/crc/pdf/crc-implement-consultation.pdf

3 Overview of the Tokyo Cap-and-Trade Program

3.1 Cap coverage (Scope)

In fiscal 2010, the Tokyo Metropolitan Government (TMG) implemented a cap-and-trade program. The sectors covered by the program (the sectors to which the cap applies) consist of the industrial sector and the commercial sector. These sectors account for approximately 40% of the greenhouse gases emitted in Tokyo.

The cap applies to large-scale facilities (buildings / factories) that have total consumption of fuels, heating and electricity of at least 1,500 kiloliters per year (crude oil equivalent).

These facilities include large CO_2 emitters such as office buildings and factories. About 1,400 facilities in Tokyo come under this classification. (This figure is based on the number of sites rather than the number of companies.)

Tokyo is characterized by many facilities in the commercial sector, including office buildings. They comprise slightly less than 80% of the facilities to which the cap applies. Office buildings under the scope of the cap include almost all major

skyscrapers in Tokyo. They also include many legislative and administrative organs of the central government, such as the Prime Minister's official residence, the Diet Building, the Ministry of the Environment, the Ministry of Economy, Trade and Industry and the Ministry of Foreign Affairs.

The GHG (greenhouse gases) emitted by the 1,400 facilities (buildings/factories) are estimated to total approximately 13 million tons CO_2eq annually. Their total emissions account for approximately 40% of the CO_2 emitted by industrial and commercial facilities in Tokyo (and approximately 20% of total CO_2 emissions in Tokyo).

The cap will be placed on CO_2 emissions resulting from fuel consumption and the use of electricity and heat from the point at which the cap-and-trade program is launched. The types of greenhouse gases to be capped will be expanded in the future.

3.2 Compliance periods

The cap-and-trade program sets five-year compliance periods. As shown below, two compliance periods will be established up until the year 2020, which is the target year for the medium-term reduction set by TMG. The first compliance period will run from fiscal 2010 to fiscal 2014 and the second will run from fiscal 2015 to fiscal 2019.
The five-year compliance period is longer than the corresponding one-year period under the EU-ETS and the three-year period under the RGGI and WCI. This longer period will enable the facilities (buildings/factories) to steadily reduce CO_2 emissions through planned investments in energy conservation. At the same time it will not hinder the effective use of emissions trading. As a result it will broaden options for facilities to achieve total GHG emissions reductions.

The cap for the second compliance period will be stricter than the cap for the first period. This will oblige facilities to achieve a continuing reduction in CO_2 emissions.

3.2.1 Banking and borrowing

Facilities (buildings/factories) that come under the cap are permitted to bank the surplus when their emissions during a given compliance period are less than the emissions allowances. Banking acts as an incentive for facilities to reduce GHG emissions ahead of schedule. It can also serve as a means of protection against unexpected developments, including an unexpected appreciation in the value of transactions determined by the market.

So-called borrowing, which is the use of emissions allowances for the following compliance period during the current compliance period, is not permitted. This is to ensure a consistent reduction in GHG emissions ahead of schedule.

3.3 Gases Covered

To comprehensively reduce GHG emissions, it is necessary to reduce all of the six major GHGs stipulated in the Kyoto Protocol. However, energy-related CO2 accounts for 95% of the GHG emissions in Tokyo. From this fact, the reduction obligation program of the TMG targets only energy-related CO_2 in the first stage. Other gases will be added sequentially and as necessary.

Although GHGs other than energy-related CO_2 are without reduction obligations, the annual reporting of the volume of emissions to the Governor of Tokyo is mandated (third-party verification of the emissions is not required). If facilities (buildings/factories) covered under the cap have a track record of total emissions reductions for gases other than energy-related CO_2, they can use a certain amount of these reductions to fulfill their overall reduction obligations, as long as this is verified by a third-party verification agency registered by the Governor. These measures are intended to generate a reduction in GHGs other than energy-related CO_2 through a planned approach.

3.4 Cap setting

The TMG cap-and-trade program is based on an absolute cap. It is not an intensity target.

The cap-and-trade program is among the most important measures to deal with climate change implemented by the TMG, and the cap was studied and set from the viewpoint of achieving the overall reduction target for Tokyo (reducing GHG emissions in Tokyo to 25% below the 2000 levels by 2020).

In this program, a compliance period of five years is set and targets are set for total emissions over the five-year period. The first compliance period (the reduction period from fiscal 2010 to fiscal 2014) is positioned as the “period of the turning point toward a significant reduction,” and the total reduction target (cap for emissions) for the first compliance period has been set to reduce the base-year emissions of the large-scale business sector by 6%(*). During the first compliance period, “the establishment of reduction organizations that also involve management,” “the planning of full-fledged energy conservation investments” and other measures are to be implemented, while even stricter reductions, which are expected to be around 17% lower than the base-year emissions, are planned for the second compliance period (period from fiscal 2015 to fiscal 2019).

* The base-year emissions of the large-scale business sector refers to the total base-year emissions of the existing facilities (buildings/factories). The total reduction target is the cap for the large-scale business sector for the first five-year compliance period, and is derived by totaling the emissions for one year, which is obtained by reducing the base-year emissions of the large-scale business sector by 6% over five years. The total reduction target includes the cap for business facilities that join with these specified business facilities in which measures against global warming are being implemented during the first compliance period and after the total reduction obligations come into effect.

<Reference>

Establishment of reduction targets for the whole of Tokyo and for individual sectors

Reduction targets for the whole of Tokyo and for individual sectors have been set in the Tokyo Metropolitan Environmental Master Plan, established in accordance with the Tokyo Metropolitan Basic Environment Ordinance.

The Tokyo Metropolitan Basic Environment Ordinance

The Tokyo Metropolitan Basic Environment Ordinance is fundamental to the environmental initiatives of TMG. The Ordinance expressly states (in Article 3) that "Conservation of the global environment must be promoted in all business activities and everyday life."

In Article 9, the Ordinance also requires the Governor of Tokyo to establish a Tokyo Metropolitan Environmental Master Plan. The Ordinance also obliges TMG to coordinate measures according to the Tokyo Metropolitan Environmental Master Plan when TMG plans or implements measures that could have an impact on the environment in Article 10.

These provisions make the targets and measures set in the Tokyo Metropolitan Environmental Master Plan binding on the Governor of Tokyo and all executive organs of TMG are obliged to achieve them.

Reduction targets set out in the Tokyo Metropolitan Environmental Master Plan

The Tokyo Metropolitan Environmental Master Plan revised in March 2008 sets out a basic viewpoint for action to deal with climate change, as well as the long- and medium-term targets. These are as follows:

〈Basic viewpoint〉

"We must restrain the temperature increase to two degrees Celsius or less if we are to avoid dangerous climate change. We must reduce global greenhouse gas emissions to less than half their current volume by 2050. Large cities in advanced countries, which consume enormous volumes of energy generated using fossil fuels, and which are concentrations of modern civilization with convenient and affluent lifestyles, must take the lead in the transition to a low carbon society that enables substantial CO_2 reductions."

<Long-term target>

"Minimize greenhouse gas emissions in Tokyo, and reduce such emissions to at least half their current volume by 2050."

〈Medium-term target〉

Reduce greenhouse gas emissions in Tokyo by 25% of the 2000 emissions level by 2020.
(This volume of reduction equals the reduction target of 19% set against the emissions level in 1990.)

〈How sector targets are set〉

Sector targets in 2020 for reducing energy-related CO_2 are set as follows:

(Unit: 10,000 tons)

	FY1990	FY2000	FY2020	Targets against the 1990 level	Targets against the 2000 level
Industry sector and Commercial sector	2,555	2,570	2,146	16%	17%
Residential sector	1,300	1,433	1,158	11%	19%
Transport sector	1,485	1,766	1,022	31%	42%
Total energy-related CO_2	5,340	5,768	4,326	19%	25%

Estimation of BaU energy consumption

Estimates of energy consumption were made based on the sustained enforcement of the current measures (no new measure was assumed), which is the so-called BaU (Business as Usual) case.

The total volume of energy consumed in Tokyo has grown from fiscal 1990 to fiscal 2000, but the city's total energy consumption fell slightly from fiscal 2000 to fiscal 2005. The slight decline in consumption since fiscal 2000 is expected to continue as a trend, with consumption in fiscal 2020 predicted to be about 774 petajoules (PJ), down 3% from the level in fiscal 2000. Trends in energy consumption are expected to vary widely among sectors. Energy consumption is estimated to rise sharply in the commercial sector from fiscal 2000 to fiscal 2020. Consumption will also grow in the residential sector. At the same time, declines are forecast for the industrial sector and the transport sector.

Estimation of BaU CO_2 emissions

Based on projected future energy consumption, estimations were made of the energy-related CO_2 emissions in the BaU case. Energy-related CO_2 emissions are expected to total 56,900,000 tons in fiscal 2020, down 1% from their level in fiscal 2000. Trends for energy-related CO_2 emissions vary significantly among sectors, depending on factors such as changes in the industrial structure, changes in the number of households and changes in the volume of vehicular traffic. Estimated changes in emissions range from a 25% increase for the commercial sector to a 26% fall for the industrial sector and a 27% decline for the transport sector. Energy-related CO_2 emissions were expected to rise 8% in the residential sector.

Setting sector targets

Targets were set using the top-down approach, in which individual sectors and bodies in Tokyo share the cuts that need to be made to reduce total emissions in Tokyo by 25% by fiscal 2020, based on the viewpoint of the "Tokyo Climate Change Strategy". This approach was used instead of establishing targets sector by sector by "accumulating" measures whose details had been confirmed up to that point.

As stated above, in the BaU case, estimated changes in emissions in the period from fiscal 2000 (base year) to fiscal 2020 vary widely among sectors. Because of this wide variation, the effects of socioeconomic trends will increase, and a large gap will arise in the actual reduction requirements imposed on individual sectors when the reduction rates are set based on their share of emissions in fiscal 2000. For this reason, this scheme considered the sharing of reductions for different sectors based on BaU estimates for fiscal 2020, instead of on emissions in fiscal 2000.

Reduction target rates for each sector, which were set against fiscal 2000 and fiscal 1990 emissions levels based on the approach explained above, are shown in the table. (Estimates were separately produced for the industrial and commercial sectors, but consolidated targets were established for the two sectors since measures adopted in these sectors are the same.)

3.4.1 Measures in sectors outside the scope of the cap-and-trade program

A Small and medium-sized business facilities in the industrial and commercial sectors

The following measures are adopted for small and medium-sized facilities:

(a) "Report on Measures against Global Warming" and action taken based on the report

The cap does not apply to small and medium-sized business facilities. However, they are obliged to draw up, submit and publicize a "Report on Measures against Global Warming" and to execute measures based on this report each year when total CO_2 emissions by business facilities owned or managed by a single company exceed a fuel, heating and electricity consumption of at least 3,000 kiloliters (crude oil equivalent). This system was introduced when the Tokyo Metropolitan Environmental Security Ordinance was amended in 2008. This system will take effect in 2010.

(b) Diagnosis of energy conservation

The Center for Promoting Activities for Preventing Global Warming, established within an extra-departmental organization of TMG, diagnoses the potential for the conservation of energy by small and medium-sized business facilities at their request, and offers advice on the energy conservation measures that they should adopt. Reductions of an average of 12% were found to be feasible through a diagnosis performed in fiscal 2008.

(c) Provision of low-interest funds for energy conservation measures

In many cases, small and medium-sized business facilities are unable to raise the funds that they need for investment in energy conservation activities due to their low funding capability. In the light of this situation, TMG is planning to start programs to make available low-interest loans to these business operators for energy-conservation investment. The loans will be available from this or the following fiscal year.

(d) Implementation of a tax reduction system

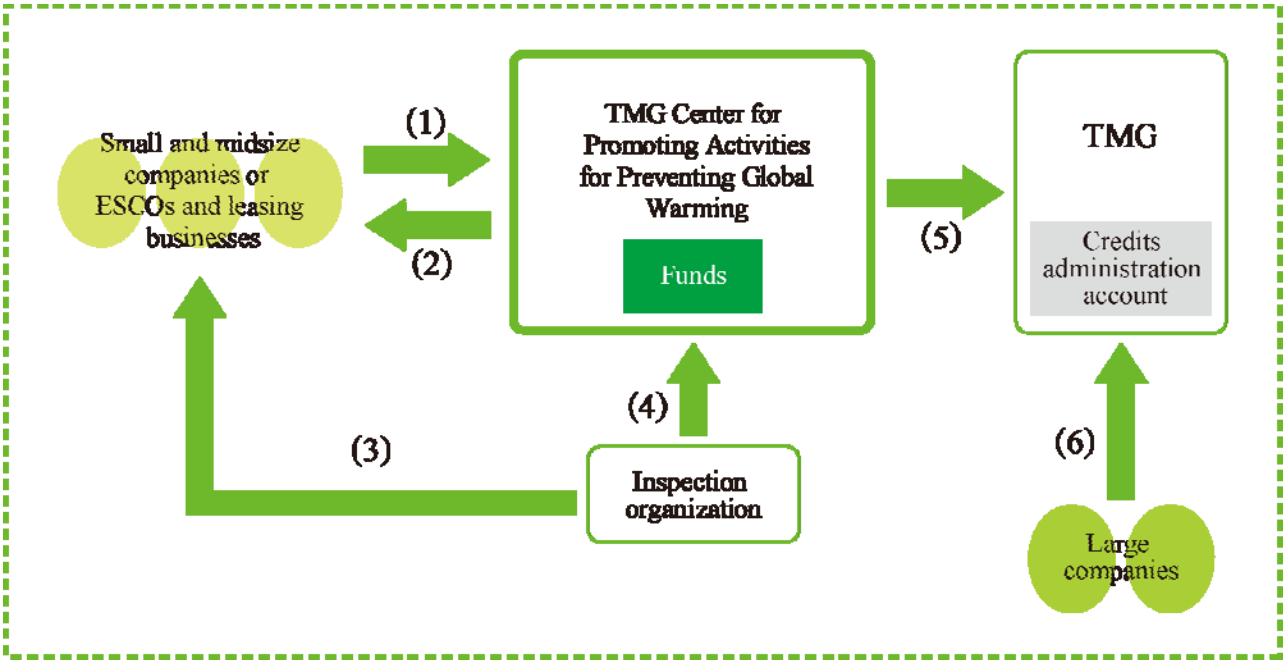
For the purpose of encouraging energy-saving measures among small and medium-sized companies through a tax system, a system that allows those small and medium-sized enterprises that have introduced energy-saving equipment from fiscal 2009 to benefit from a tax reduction has been implemented. This allows those small and medium –sized enterprises that have submitted a Report on Measures against Global Warming and that have also introduced TMG-designated energy-saving equipment to halve their payments by having half of the price of such equipment deducted from their corporate enterprise tax.

(e) Credit scheme through granting subsidies to small and medium-sized companies that introduce energy conservation equipment.

Utilizing the TMG fund of eight billion yen to combat global warming, TMG carries out a project to support small and midsize companies that introduce equipment that has a high energy efficiency rating, based on an energy conservation diagnosis (in FY2010 and FY2011). In addition to these small and midsize companies, ESCOs (Energy Service Companies) and leasing businesses that make a contract with small and midsize companies can apply for the subsidies. TMG has introduced a system

through which reduced CO_2 emissions are converted to credits that can be acquired by large companies, and these credits can then be utilized under the TMG Cap-and-Trade Program.

Project to Create Emissions Credits by Promoting Energy Conservation in Small and Midsize Companies



Scheme under the project

(1) Small and midsize companies, or ESCOs and leasing businesses that make a contract with such small and midsize companies, apply for subsidies to introduce energy saving equipment. These entities need to meet certain set requirements.

(2) The subsidies are granted, provided that the reduced CO_2 emissions credits are transferred at no cost to TMG.

(3) An inspection organization inspects the initial volume of CO_2 emissions and the volume of reduced CO_2 emissions of the small and midsize companies involved.

(4) The inspection organization reports the results of the inspections.

(5) The volume of reduced CO_2 emissions is registered in the credits administration account of TMG.

(6) Large companies (facilities under the cap) acquire the credits created through this project to fulfill their obligation to reduce CO_2 emissions.

B Residential sector

(a) Encouraging the use of solar energy

CO_2 emitted by homes can be slashed by replacing the use of electricity and heat generated with fossil fuels with the use of photovoltaic generation and solar heat. In September 2008, TMG decided to establish a ¥9 billion fund to begin subsidizing in fiscal 2009 initiatives for installing photovoltaic units and solar heating equipment in homes. Through this program, TMG aims to increase the use of

solar energy to one million kilowatts of electricity by fiscal 2016. It aims to introduce photovoltaic units or solar heating equipment to 20,000 metropolitan households in fiscal 2009.

(b) Encouraging the use of high-efficiency water heaters

High-efficiency gas water heaters developed by Tokyo Gas Co., Ltd. are more efficient than their conventional counterparts. They can reduce CO_2 emissions by 13%. Heat-pump water heaters developed by Tokyo Electric Power Company have also increased efficiency considerably, compared with conventional gas water heaters. TMG intends to encourage the use of this equipment by setting up a certification system for the performance of high-efficiency water heaters.

(c) Encouraging the use of energy-saving home appliances with energy-saving labels, etc.

TMG in fiscal 2005 required the in-store display of home appliance labels that indicate the energy conservation performance of home appliances. It was the first local government in Japan to take this step. TMG is encouraging the use of energy-saving home appliances through a range of initiatives, including effective use of this labeling system.

C Transport sector

(a) Mandatory introduction of low-pollution and fuel-efficient vehicles

The amendment of the ordinance in March 2009 now requires business facilities that use 200 or more automobiles in Tokyo to introduce the low-pollution/fuel-efficient vehicles designated by the Governor for at least 5% of their fleet. The obligation of the amendment will take effect from fiscal 2011.

(b) Development of mechanisms that support autonomous initiatives, including the Eco-Driving Campaign

Eco-driving means driving and using vehicles in a way that is environmentally friendly. It includes avoiding abrupt acceleration, abrupt deceleration, engine racing for non-driving purposes and extended idling. Eco-driving has a dramatic effect on CO_2 reductions. TMG will pursue broad initiatives to inform metropolitan residents and business operators, increase their interest in eco-driving, and establish this kind of driving in society. At the same time, TMG will develop mechanisms that help small businesses and others to pursue their own initiatives for promoting eco-driving.

(c) Adoption of traffic policies that take advantage of the world's most extensive public transportation system

Tokyo boasts a public transportation network that is of a leading world standard. One of the most important actions on climate change being taken by TMG is to encourage the public to avoid over-reliance on cars in the city, and to take advantage of the network to use public transport instead of private vehicles.

To make changes in this direction, TMG will adopt a number of initiatives. For instance, it will restrict the use of passenger cars by introducing a park-and-ride system based on days of the week, the hour and the traffic situation. It will also adopt measures to ensure convenience and roundtrip access for people using public transportation systems. TMG will also encourage the practice of car-pooling.

3.5 Allowance allocation

The method of allocating allowances to facilities to which the cap applies is described below.

3.5.1 General allocation rules applied to incumbent facilities

With the exception of allowances reserved for new entrants, caps for all five years are allocated in gross to incumbent facilities (facilities in operation at the time the scheme is launched) free of charge at the beginning of each compliance period.

* The term new entrants refers to facilities (buildings/factories) that satisfy the condition that the consumption of fuels, heat and electricity is 1,500 kiloliters or more per year (crude oil equivalent) for the first time after fiscal 2010.

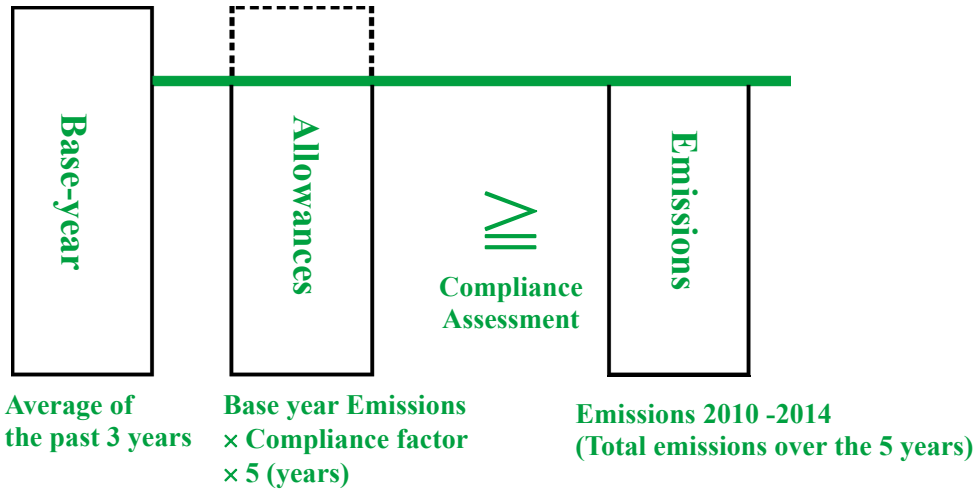
Allowances for the respective facilities (buildings/factories) are allocated according to the grandfathering method based on past emissions. Base-year emissions are calculated on the basis of the average of actual emissions of the facilities over the past three years.

The allowance volume is calculated by multiplying the base-year emissions by the compliance factor. 5 years of allowances are allocated at the beginning.

- Allowances: Base-year Emissions × Compliance factor × 5 (years)
- Base-year emissions: Average of the past 3 years

The compliance factor is determined based on regulations established by the Governor of Tokyo. The compliance factor for the first compliance period was determined in March 2009.

The compliance factor for the second compliance period is scheduled to be determined prior to fiscal 2015 when the second compliance period begins. The compliance factor for the second compliance period will be established as a value stricter than the value of the factor for the first compliance period.



3.5.2 Allocation rules for new entrants from fiscal 2010

New office buildings and other new entrants built after fiscal 2010 are allocated allowances from the new entrants reserve free of charge. Base year emissions for new entrants are set based on the average

actual emissions over two to three years with the execution of certain energy-saving measures specified by TMG.

The adoption of certain energy saving measures specified by TMG is required for the initial period of two to three years. This is because new entrants may take deliberate action to emit large volumes of greenhouse gases so as to be eligible for a greater allowance if the allowances are allocated on the basis of past emissions alone, without any obligation.

If new entrants fail to execute the required energy-saving measures, strict efficiency standard determined by TMG will be applied.

With the revision of the Tokyo Metropolitan Environmental Security Ordinance in June 2008, large-scale buildings to be constructed in Tokyo must satisfy certain energy-saving performance requirements, almost simultaneously with the introduction of the cap-and-trade program.

Fulfilling stringent energy-saving performance requirements also became a condition for obtaining a bonus plot ratio in a building already under construction in fiscal 2008. Large-scale buildings to be constructed in Tokyo from now on will have to satisfy stringent energy-saving performance requirements from their initial stage, since the majority will be constructed by taking advantage of the bonus plot ratio system.

New measures for these new buildings will improve the energy-saving performance of facilities that join the cap-and-trade program and will increase its effectiveness.

3.5.3 Closures

The threshold for facilities (buildings/factories) eligible for an allowance allocation is that the consumption of fuels, heat and electricity in the previous fiscal year was 1,500 kiloliters or more (crude oil equivalent). Facilities are permitted to leave the cap-and-trade program if their energy consumption falls below this threshold for three consecutive years. Facilities are not allowed to leave the scheme if their consumption dips below the threshold for just one year. Factories, office buildings and other facilities must submit a report to the Governor of Tokyo, and receive the Governor's approval to leave the scheme when they close due to the discontinuation of the business or for other reasons.

The compliance period under TMG's cap-and-trade program runs for five years. When a given installation leaves the cap-and-trade program during the compliance period, total emissions reduction obligations are adjusted for the period until the fiscal year in which the installation leaves the scheme. For example, if an installation leaves the scheme in fiscal 2013 during the first compliance period from fiscal 2010 to fiscal 2014, obligations are adjusted based on actual emissions in the three-year period from fiscal 2010 to fiscal 2012.

■ For example:

Allowances		**Emissions**
for the installation Base year emissions × Compliance factor × 3 (years)	≧ **Compliance Assessment**	Emissions 2010 -2012 (Total emissions over the three years)

3.6 Monitoring, Reporting, and Verification

In the course of each five-year compliance period, facilities (buildings/factories) that come under the cap are obliged to report greenhouse gas emissions in the previous fiscal year to the Governor, and to disclose such data every fiscal year. The greenhouse gas emissions are verified by a third-party verification agency registered with the Governor of Tokyo. (The penalties described below apply to facilities that fail to meet their reporting and disclosure obligations.)

In July 2009, the Governor of Tokyo established the Guidelines for Calculating Greenhouse Gases for facilities under the cap, the Guidelines for Verifying Greenhouse Gases for registered verification agencies, and the Guidelines on Application Procedures for Registering as a Registered Verification Agency.

For securing the fair operation of the cap-and-trade program, it is essential that the calculation and verification of GHGs are conducted pursuant to clear rules, and the guidelines above assume important roles in this regard.

The Guidelines for Calculating Greenhouse Gases stipulate the detailed calculation rules for each of the following steps: (1) defining the scope of facilities under the cap; (2) clarifying emission activities and defining the monitoring points for fuel consumption; and (3) clarifying fuel consumption.

Most of the energy-related CO_2 in Tokyo derives from electricity and city gas consumption, which are supplied by the Tokyo Electric Power Company, Tokyo Gas Co., Ltd. and other energy suppliers. The Measurement Law of Japan mandates that these energy suppliers use effective measurement gauges that have been examined and certified pursuant to the law. The Guidelines for Calculating Greenhouse Gases stipulate that energy consumption shall be calculated and verified based on consumption certificates that indicate the consumption measured by such gauges, as well as bills and receipts. In order to ensure that the calculation and verification are carried out smoothly, the TMG has arranged for notifications of previous energy consumption levels to be sent to facilities under the cap, with the cooperation of the energy supplier.

Facilities that come under the cap have started preparing for the calculation and verification of the base-year emissions and annual emissions, taking into consideration the Guidelines for the Calculation of Greenhouse Gases for facilities that come under the cap. The results of the calculation and verification of the base-year emissions are to be submitted to the Governor of Tokyo by the end of September 2010, and the procedures for the submission are set to commence in the latter half of fiscal 2009.

In addition, in July 2009 the TMG hosted a seminar for the development of the verifying personnel who need to be stationed at registered verification agencies. Consequently, in August 2009, the TMG began accepting applications for the registration of verification agencies. The Governor registered about 30 verification agencies by the end of August 2009.

3.7 The emissions factor

As stated above, the main targets of TMG's cap-and-trade program are the final users of energy. In addition, indirect emissions rules have been adopted in Japan. Under this concept, CO_2 emissions produced through electricity generation are counted as emissions by the facilities (buildings/factories) that use the electricity, instead of emissions by the power plants.

Accordingly, in TMG's cap-and-trade program, power consumption at a given installation eligible for an allowance allocation is converted to CO_2 emissions, using an emissions factor.

In the Tokyo cap-and-trade program, a fixed emissions factor will be used to calculate CO_2 emissions that result from electricity use for the purpose of clearly identifying efforts made by energy consumers, including office buildings and factories, to reduce emissions. The use of the fixed factor seeks to prevent wild fluctuations in emissions by energy consumers as a result of improvements or the aggravation of the CO_2 emissions factor by energy production issues.

The largest proportion of electricity consumed in Tokyo is supplied by a company called Tokyo Electric Power Company, Inc. (TEPCO). In 2007, a core TEPCO nuclear power plant suspended operations following a major earthquake in Niigata Prefecture. This event has naturally led to an aggravation of the emissions factor. However, reflecting this kind of change immediately in the calculation of CO_2 emissions by metropolitan business facilities results in a situation where the calculated emissions rise due to power production issues, while the volumes of energy actually used by metropolitan business facilities fall, thanks to energy-saving and other efforts.

In TMG's cap-and-trade program, the emissions factor is fixed to prevent such irrational movements. TMG's program has been designed with an emphasis on promoting less energy consumption by the final consumers and a reduction in CO_2 through streamlining and other initiatives.

We believe that this approach is essentially the same as the one taken in the Carbon Reduction Commitment (CRC) now under discussion in the UK (See page 8).

Advancing measures to reduce CO_2 emissions through power generation are also essential for promoting CO_2 reductions. TMG's scheme addresses this issue through separate measures called the Energy and Environmental Plan. This measure obligates power suppliers to submit their emissions coefficients, plans to improve them, and their plans to promote the installation of renewable energy to the Governor of Tokyo every year and to disclose them.

Box :The Energy Environment Plan

In promoting measures to reduce CO_2 emissions among power generation operators (power suppliers), TMG, with its Energy Environment Plan based on the Tokyo Metropolitan Environmental Security Ordinance, is establishing a policy of influencing power suppliers to improve the efficiency of power generation.

This system obligates power suppliers (TEPCO and other PPS operators, seven companies in total) to submit their emissions coefficients, plans to improve them, and their plans to promote the installation of renewable energy to the Governor of Tokyo every year and to disclose them. This has been in effect since fiscal 2005.
This system enables electricity consumers to know which power operator supplies electricity with what level of CO_2 emissions coefficient. Public facilities in Tokyo can use this system in the bidding process when evaluating the tenders submitted by power suppliers, in which the level of the CO_2 emissions coefficient that the operator must comply with and the ratio of renewable energy that they must install has been determined.

3.8 Compliance Assessment (Punitive measures: legal character of reduction obligations and penalties)

Facilities (buildings/factories) eligible for an allowance allocation are obliged to keep their emissions below the caps. These are mandatory obligations. Penalties apply to any breach of these obligations. The penalties consist of fines (up to ¥500,000), publication of the breach, and a type of surcharge collected in proportion to the failure to fulfill the obligation.

There is an obligation to keep the emissions of facilities within the allocated emissions allowances (or the sum of such allowances and allowances bought from other facilities). They cannot evade this obligation even after the payment of fines. Each installation coming under the cap is required to bear the costs that are commensurate with the volume of over-the-allowance emissions when it fails to fulfill the obligation to keep emissions within the allocated allowances. The details are as follows.

The compliance period under TMG's cap-and-trade program extends for five years. Under the scheme, a compliance assessment is made in the sixth fiscal year since emissions for the fifth fiscal year, the final year for a compliance period, are determined in the sixth fiscal year. To give an example, a compliance assessment is made in fiscal 2015 for the first compliance period from fiscal 2010 to fiscal 2014.

Facilities eligible for an allowance allocation report their total emissions for five years to the Governor of Tokyo as of fiscal 2015. At this point, the facilities must procure any reduction shortfall through emissions trading within fiscal 2015 to bring their emissions under their allocation. The Governor of Tokyo orders the facilities to reduce their emissions by a volume calculated by multiplying the volume of emissions exceeding the cap or the allowance shortfall for fulfilling the obligation by 1.3 or a smaller figure.

Fines (of up to ¥500,000) are imposed on the facilities, and any breach of the order, including the names of the business facilities, is made public if the facilities fail to achieve compliance by the deadline for implementing the Governor's order. In these cases, the Governor of Tokyo procures in the market the additional emissions allowances the facilities need to meet their obligations, and charges these facilities the cost of this operation. These steps function as a surcharge system. (The amount of the surcharge will be decided by the Governor of Tokyo and will be calculated on a per ton

basis.) As stated above, the facilities under the cap must pay the costs associated with bringing their emissions to within their allowance.

These sanctions are regarded as being quite severe and unusual for climate change measures in Japan.

There are additional punitive measures for a breach of the obligations with respect to reports on greenhouse gas emissions for the previous fiscal year that facilities under the cap make to the Governor of Tokyo and the publication of such data in each fiscal year. Fines (of up to ¥500,000) are imposed, and the breach is made public when no such report is made. If no publication is issued, this is also made public. Fines and other punitive measures are set for fixed breaches of the obligation by third-party verification agencies to maintain their quality above a fixed level.

3.9 Emissions trading mechanism in the TMG program

Emissions allowances have not yet been extensively traded in Japan. As a result, financial institutions and other companies in Japan do not have significant trading experience.

Numerous parties, including financial institutions and the Tokyo Stock Exchange, are showing strong interest in TMG's cap-and-trade program, the first of its kind in Japan.

We will facilitate the development of emissions trading schemes in Japan by actively providing information to these parties through the launch of this scheme. In addition, the TMG has worked to formulate the emissions trading rules with reference to the opinions of experts.

Preparations for establishing a registry of reductions

The TMG has conducted the preparatory work for establishing the registry of reductions as an emissions registry by the end of fiscal 2010. The registry of reductions is being established to manage emissions trading records, and a record needs to be made with the registry when acquiring, transferring or using excess reduction or offset credits to fulfill obligations. Each of the facilities (buildings/factories) under the cap needs to establish an account with the registry of reductions. Brokers and entities other than facilities under the cap who wish to participate in emissions trading should also open a general account.

In addition, the regulations and tools for facilitating a smooth trading system are to be established by the end of fiscal 2010. For example, the annual emissions and actual reductions of facilities under the cap are publicized once a year on the information disclosure website of the TMG to clarify the situation of the performance of obligations by facilities under the cap. In addition, there is a plan for the publication of a list of brokers, for which there is strong demand from facilities under the cap.

3.10 Offsets (Project - based emissions reductions outside the capped sector)

In addition to emissions trading with other facilities (buildings/factories) under the scope of the same cap, facilities receiving allowance allocations may use several offset projects to meet their obligations. Like its cap-and-trade program, the TMG's offset projects basically cover the industrial sector and the commercial sector.

The main reasons for allowing the use of offsets in the TMG program are the following:

- Providing additional options for emissions reduction methods outside the cap will give regulated facilities more flexibility in responding to their reduction obligations.
- Providing cost containment options for regulated facilities will increase their reliance on the TMG's cap-and-trade program.
- The policy effects of the TMG's cap-and-trade program will be extended to unregulated sectors and regions.

The major credits currently assumed for use as offsets are the following:

(a) Small and Medium-sized Installation Credits Within the Tokyo Area:
Emissions reductions achieved through energy-saving measures (emissions reduction in energy-related CO_2) by small and medium-sized facilities other than facilities under the scope of the TMG's cap-and-trade program (Reductions that are verified by third parties).

(b) Outside Tokyo Credits:
Emissions reduction achieved through energy-saving measures (emissions reduction in energy-related CO_2) is the scope. For facilities exceeding the cap coverage of the TMG's cap-and-trade program, conditions regarding usage and other matters are planned to be set by the Governor. The TMG sets restrictions, including upper limits, on transaction volumes since reductions within the Tokyo metropolitan area may decline if such volumes are not controlled.

(c) Renewable Energy Certificates:
A system has been created in Japan to separately evaluate the environmental value of electricity generated using renewable energy, and to trade this value in the form of a certificate. These renewable forms of energy include solar power, wind generation, and waste heat utilization. The TMG decided to include these certificates as offset credits effective under its cap-and-trade program.

In order to achieve the CO_2 emissions reduction goals by 2020, and to continue its drastic emissions reductions further on from this date, the expansion of renewable energy usage along with the promotion of energy saving measures are essential. Thus, the Tokyo cap-and-trade program prioritizes these renewable energy certificates as one of the most effective offset credits that can be used under this program. In particular, for electricity generated by solar power, wind power, geothermal power, and hydropower (generation below 1,000 kW), the renewable energy credit is calculated at one and a half (1.5) times the general amount.

As a general rule, commitment to the MRV guidelines issued by the TMG and registration on the registry list is required.

3.11 Measures to prevent a surge in trading prices

To establish a sound carbon market, measures are also required to prevent abnormal trading price surges.

To stabilize the emissions trading prices, first of all the TMG will endeavour to prevent trading price surges through measures to increase the supply of reductions that are traded.

Efforts will be made to prevent trading price surges by providing measures such as, for example, generating excess reductions by implementing CO_2 reduction measures at facilities under the cap, utilizing the Solar Energy Bank (*1), expanding the supply of credits for small and medium-sized enterprises in Tokyo, and other measures for increasing the supply of reductions that are traded.

If the Governor considers that there is the possibility of an abnormal surge in trading prices despite these measures, further measures to prevent surges will be implemented, such as increasing the use of credits outside Tokyo and enabling the use of Kyoto Credits on condition that credits for small and medium-sized enterprises in Tokyo are also used, within the scope necessary for suppressing price surges.

*1: Promoting the use of renewable energy credits – utilizing the Solar Energy Bank of the TMG

The TMG is providing subsidies to 40,000 households for two years from fiscal 2009 to support the introduction of household appliances powered by solar energy. The requirement for receiving the subsidy is that the houses which install such appliances must transfer the environmental benefits to the Center for Promoting Activities for Preventing Global Warming for ten years. The Center stores these environmental benefits in the Solar Energy Bank, and sells them in the form of Green Electricity (Heat) Certificates.

Furthermore, measures will be implemented to ensure a stable supply of Green Electricity (Heat) Certificates by the Solar Energy Bank and enable the certificates to be used when fulfilling reduction obligations.

3.12 Relationship between TMG's program and Japan's greenhouse gas inventory

TMG's cap-and-trade emissions trading program is intended to have the effect of reducing CO_2 emissions and energy consumption in the industrial business sector within Tokyo and throughout Japan. It also promotes the installation of renewable energy in the power generation sector.

These actions by Tokyo will contribute to Japan restricting its domestic emissions to within the limits of Japan's AAU (Assigned Amount Unit).

4 Aiming to Establish a Carbon Market in Japan and throughout the World

4.1 Effective operation of the Tokyo-ETS

Firstly, the cap-and-trade program of the TMG, which is due for its full-scale launch in April 2010, needs to be operated efficiently to demonstrate its effectiveness in Japan.

Since the July 2008 decision to introduce the cap-and-trade program by amending the Tokyo Metropolitan Environmental Security Ordinance, the TMG has developed the program in detail. In March 2009, the cap level and compliance factors were finalized, and the Guidelines for Measures against Global Warming, Guidelines for Monitoring Emissions, Guidelines for Verifying Emissions and Standards for Certifying Top-Level Facilities (buildings/factories) were established from April to August. As of now, the details of the Tokyo cap-and-trade program have been almost completely finalized, other than the Guidelines on Trading Operations that are to be formulated in the next fiscal year.

In view of the progress made with the configuration of the program, the TMG has already begun contacting around 1,400

facilities (buildings/factories) that come under the cap. Briefings on the details of the scheme were held several times between June and August, and were attended by a total of around 8,000 people. The 1,400 facilities coming under the cap are mandated to report the status of their emissions to the TMG by the end of October 2009. Based on these reports, the TMG will select and notify the facilities that come under the cap by the end of FY2009.

Facilities that are deemed to come under the cap must submit their base-year emissions verified by one of the verification agencies registered with the TMG by the end of September 2010. Based on the submitted data, the TMG will allocate the finalized emissions allowance for the five-year period from FY2010 to 2014 in FY2010, and notify each of the facilities.

The TMG will provide technological support to ensure effective progress with the reduction in CO_2 emissions at each of the facilities by organizing seminars on reduction methods, etc. In addition, the TMG will cooperate with civil sector entities to establish the information platform related to emissions trading to ensure the smooth trading of emissions.

4.2 Introducing a cap-and-trade program that covers the whole of Japan

The second role to be played by the TMG is that of achieving the prompt introduction of a cap-and-trade program that covers the whole of Japan, based on the achievements obtained in Tokyo. No matter how effectively the Tokyo program functions, the prompt introduction of a nationwide cap-and-trade program is indispensable for Japan to meet its international CO_2 reduction obligations. For this purpose, the TMG has begun pursuing the following two initiatives.

The first measure is to urge the governments of other prefectures and ordinance-designated cities (major cities) to introduce a sub-national level cap-and-trade program, just as Tokyo has done. The TMG ran a seminar on policy measures targeting these local governments in August 2008 and July 2009, with 80% of the local governments participating.

In many parts of Japan, local governments have begun strengthening measures targeted at large-scale facilities. Tokyo's cap-and-trade program has been configured based on the Global Warming Measures Plan system that has been in place since 2002. Although this system does not obligate large-scale facilities to reduce total emissions, it does mandate them to report on their emissions and formulate reduction plans. The introduction of a preliminary stage program can prepare the localities for the launching of a sub-national level cap-and-trade program. By the end of FYw2010, 33 prefectures and major cities nationwide have introduced such a program, and the TMG will also support them in the introductory process and with their effective operation.

The second measure is to urge related national government organizations to introduce a national-level cap-and-trade program. The TMG has contributed toward and cooperated with the Ministry of the Environment and the Ministry of Economy, Trade and Industry, which play central roles in studies on national government emissions trading in the course of their studies on national government-level programs. Even greater efforts will be made in this direction in the future.

Tokyo's Proposals for the Introduction of a Nationwide Cap-and-Trade Program in Japan

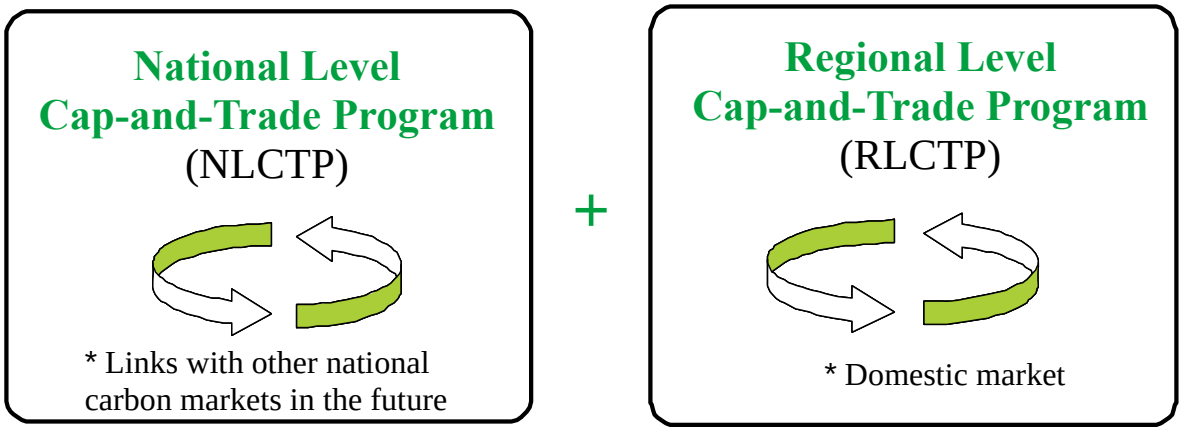
In September 2009, Japan's former Prime Minister Yukio Hatoyama declared the target of a reduction in the country's GHG emissions to 25% below the 1990 level by 2020. TMG welcomed this initiative by the national government and, as the first sub-national government to introduce a cap-and-trade program in Asia, announced on 27 November 2009 a proposal for achieving the target by establishing a nationwide cap-and-trade program in Japan.

In its proposal, TMG stated that any national cap-and-trade program should be mandatory and not voluntary, and that it should have an absolute cap rather than an intensity based one. The design of such a cap-and-trade program should thus correspond to global standards so that in the future Japan's national program can be linked to other national carbon markets. Japan's national program should also actively engage sub-national governments as well as operate at the national government level.

Outline of the proposed nationwide cap-and-trade program

TMG has therefore outlined a proposed two-tier system of a National Level Cap-and-Trade Program (NLCTP) targeting approximately 500 super large-scale energy and resource suppliers, such as power plants and steel plants, and a Regional Level Cap-and-Trade Programs (RLCTP).

The RLCTP would be managed by the governments of prefectures and major cities and focus on large facilities such as factories, office buildings, and public facilities, which total about 14,000 sites nationwide.



This two-tier system is estimated to cover at least 60% of Japan's total domestic CO_2 emissions. While the NLCTP could eventually be linked to a global emissions trading system, emissions trading under the RLCTP should be confined to the domestic market.

4.3 Collaborating with major cities and sub-national governments worldwide

The third role to be played by the TMG is that of strengthening ties with the major cities and sub-national governments worldwide to broaden the foundation of the international carbon market.

Looking at major cities around the world, Tokyo is not the only one strengthening its efforts to become a low-carbon city. In 2007, when the TMG announced the Tokyo Climate Change Strategy, the Mayor's Climate Change Action Plan was formulated in London in February with the aim of reducing CO_2 emissions by 60% of the 1990 level by 2025, the Greener Greater New York Plan was completed in New York in April with the aim of reducing emissions by 30% of the 2005 level by 2030, and the Plan Climat de Paris was announced in Paris in October with the aim of achieving a 75% reduction in the 2004 level of emissions by 2050.

Modern civilization has consumed enormous quantities of energy derived from fossil fuels, and people have enjoyed convenient and affluent lifestyles. It is now widely recognized that the major cities of the developed countries, where modern civilization is concentrated, should lead the world in the mission to create a low-carbon society that undertakes large-scale CO_2 reductions. In this age of climatic crisis, it is unforgivable to continue discharging CO_2 without limits, as we have been doing.

Tokyo and other major cities of the world have formed a network organization named the Climate Leadership Group (C40), and they have worked together to strengthen these measures. However, to date Tokyo is the only city to have introduced a cap-and-trade program that also addresses businesses and other functions. The TMG will convey the experience of Tokyo to other major cities of the world in an effort to promote urban cap-and-trade schemes.

Interest in the Tokyo-ETS has been shown not only by major cities in developed countries, but also by those in developing countries. If the major cities in developing countries start implementing measures to reduce CO_2 before their national governments do, this might help achieve the long-term target of reducing global emissions by the middle of the 21st century. From this viewpoint, the TMG will also make efforts to provide information to the major cities of developing countries.

Measures to combat climate change are being strengthened at all levels of government worldwide, including the governments of major cities and state governments that are members of the International Carbon Action Partnership (ICAP) in countries such as the United States and Canada. Measures undertaken by the central government will not be sufficient to achieve the radical CO_2 reductions necessary to avoid crises caused by climate change. The shift toward a low-carbon society and the establishment of low-carbon societies that embrace all economic systems will only become a reality if action is taken by sub-national governments along with central governments.

For these reasons, the TMG will continue to contribute to action on climate change in conjunction with sub-national governments worldwide. It will do so through a number of channels at different levels, including ICAP and C40.

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http://www.theicct.org/documents/Ohno_TokyoPolicy_HK.pdf

Environment of Tokyo (TMG website)

http://www.kankyo.metro.tokyo.jp/kouhou/english/index.html

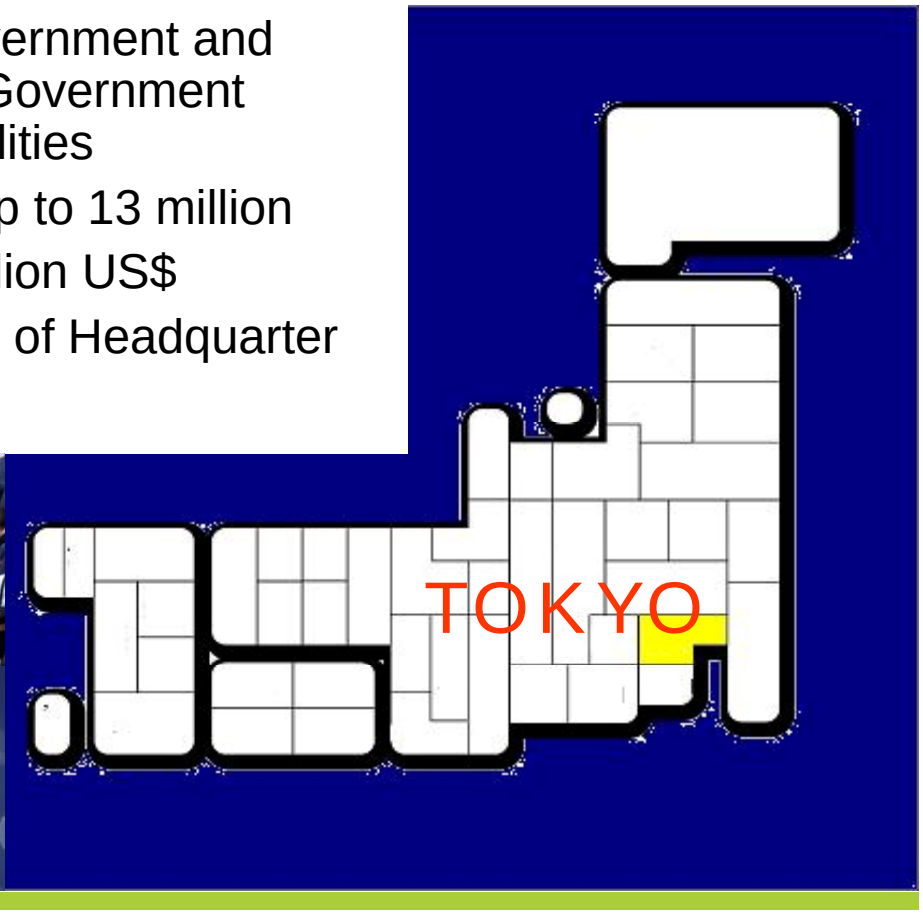
Tokyo Metropolitan Government

Tokyo Cap-and-Trade Program (Tokyo-ETS)

March 2010

Metropolis Tokyo

- Both Urban Local Government and Extensive Provincial Government including 62 Municipalities
- Population reaching up to 13 million
- FY2006GDP 815 Billion US$
- Intense concentration of Headquarter Offices



Total CO2 Emission in Tokyo(FY2006)

- Large emission comparable to a country
- High growth in Office Sector

	1990FY	2000FY	2006FY	Growth	
	(Mt-CO_2)	(Mt-CO_2)	(Mt-CO_2)	1990-2006	2000-2006
Industry	9.8	6.8	5.2	-47.0%	-23.5%
Commercial	15.7	18.9	20.6	31.1%	9.0%
Household	13.0	14.3	14.4	11.0%	0.7%
Transportation	14.8	17.6	14.7	-1.1%	-16.5%
Others	1	1.2	1.0	-0.5%	-16.7%
Total	54.4	58.8	55.9	2.8%	-4.9%

TOKYO METRORITAN GOVERNMENT

Prior Programs: Tokyo CO_2 Emission Reduction Program

The introduction of Tokyo CO_2 Emission Reduction Program

Phase 1: fiscal 2002 – 2004

Phase 2: fiscal 2005 – 2009

- Instructions and advice provided by TMG to push facilities to set the reduction targets at higher level
- Submission of yearly progress reports required by facilities
- Evaluation and public announcement of outstanding facilities

TOKYO METRORITAN GOVERNMENT

Outcome of the Program

- Most reduction targets and plans remain at a basic level.
- Planning in-depth measures to achieve significant CO_2 reductions under a voluntary system is exceedingly difficult
- Emission reduction costs necessary to be acknowledged as indispensable expense

Introduction of mandatory CO_2 reduction and emissions trading program

TOKYO METROROLITAN GOVERNMENT

Introduction of the Tokyo-ETS

The world's first urban cap and trade program to cover office buildings as its emissions reduction targets

Cap coverage：1,400 facilities（including 1,100 business facilities and 300 industrial facilities）

Start: April 1st 2010

■Reference■

- **EU ETS coverage**
  : combustion plants, oil refineries, iron and steel plants, cement factories, etc.
- **US RGGI coverage**: thermal power plant
- **UKCRC coverage**：business and public sector organizations

TOKYO METROROLITAN GOVERNMENT

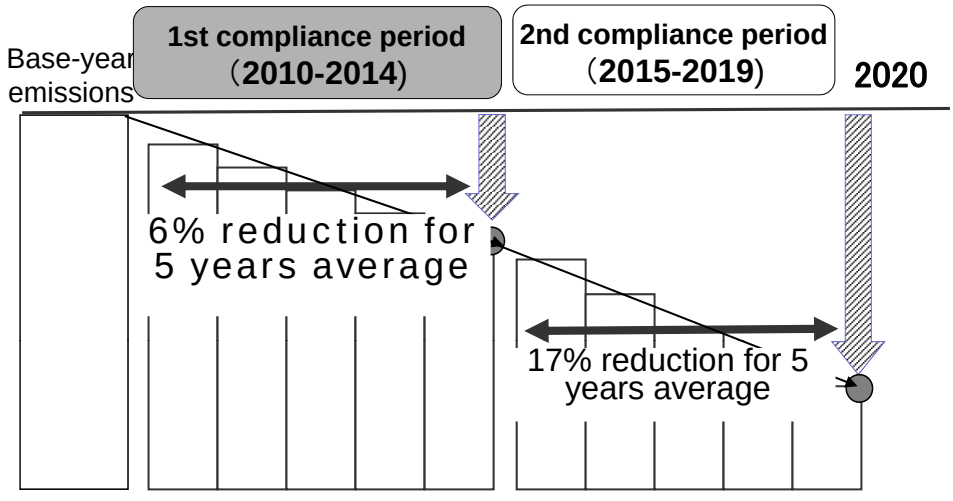
Tokyo-ETS (1)

Coverage	**Large facilities, such as office buildings and factories.** --Consumption of fuels, heat and electricity is 1,500 kiloliters or larger per year (crude oil equivalent)
Persons subject to total reduction obligations	**The owner of the facilities subject to the obligations; however, another person may assume the obligations in place of or jointly with the owner, if notification is made.** *A tenant who is the owner of businesses of a certain scale or larger may also assume the obligations.
Compliance period	5 years --1st compliance period : from FY2010 through FY2014 --2nd compliance period :from FY2015 through FY2019 Monitoring and Reporting: every year
Gas covered	Energy-related CO_2

TOKYO METROROLITAN GOVERNMENT

Tokyo-ETS (2)
CAP setting

■**TMG's target of GHG emission reductions (25% reduction levels by 2020 from the 2000 emission)** * **17% reduction level is required for commercial sector**



*The cap for the first compliance period has been set at a level of 6% below base year emission

*The cap for the second compliance period will need to be set at a level of approximately 17% below base year emission

(cf.) EU-ETS -5.7%(2008-2012) -21%(2013-2020)
RGGI ±0%(2009-2014) -10%(2015-2018)

TOKYO METROROLITAN GOVERNMENT

Tokyo-ETS (3)

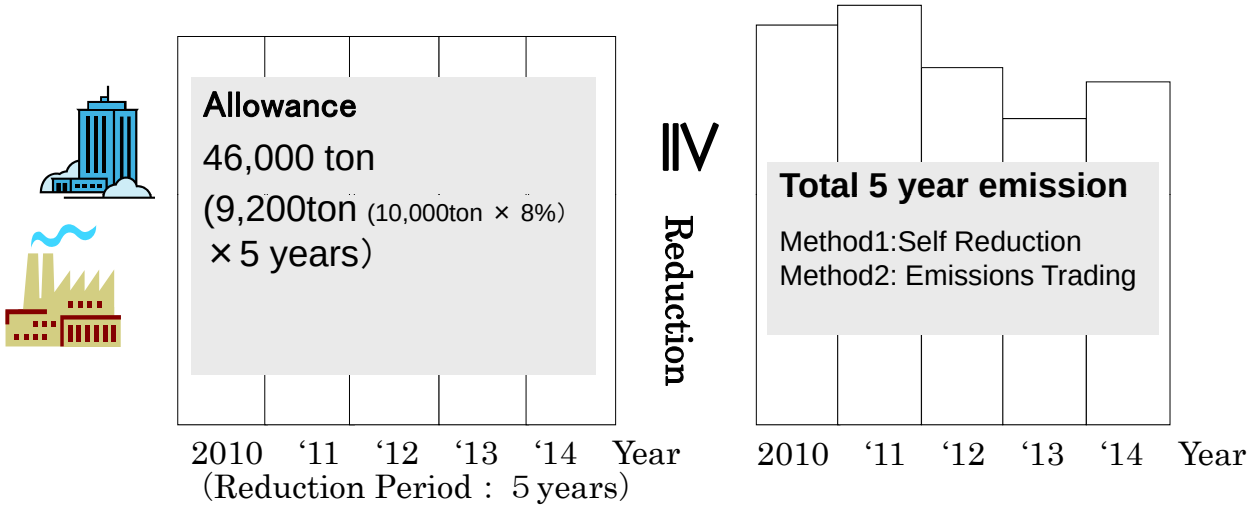
Compliance factor	1st Compliance Period: 6% or 8% * 6% for factories (and buildings receiving energy from district heating and cooling plants) * 8% for rest of the buildings **2nd Compliance Period: 17% (planned)** －Facilities that have made outstanding progress with regard to measures against global warming are recognized as top-level facilities whose compliance factor is reduced to 1/2 or 2/3
Allowance allocation	Grandfathering Allowances: Base year emission ×Compliance factor × Compliance period (5years) *Base year emission: Average emission of past 3 years
Compliance assessment	**Compliance assessment will take place after completion of each phase** (i.e. after 5 years)

TOKYO METROROLITAN GOVERNMENT

Tokyo-ETS (4)
Allowance Allocation

Base year emission ×Compliance factor × Compliance period (5years)
*Base year emission: Average emission of past 3 years

For Example, ●Base year emission：10,000 ton
●Compliance factor for 1st compliance period：▲8% reduction



Tokyo-ETS (5) Certification as Top-Level Installation

- Facilities that have made outstanding progress in the implementation of measures against global warming
  ⇒Certified as top-level facilities (the compliance factor is reduced to 1/2
- Facilities that have made excellent progress in the implementation of measures against global warming
  ⇒Certified as near-top-level facilities (compliance factor is reduced to 3/4)

Countermeasures (examples)		
General administrative items	Energy management organization	Organization within installation, hosting of energy conservation conferences, etc.
	Measurement of energy consumption	Installation of measurement gauges at appropriate locations, and analysis
	Commissioning	Setting and adjusting performance verification items
Items related to building and facility performance	Energy conservation performance of the building	Level of heat insulation, etc.
	Energy conservation performance of the facilities	Energy conservation performance of the facilities
	Energy conservation performance of control systems	Introduction of control devices for the facilities and setting appropriate control values, etc.
	Use of reneable energy	Direct use, installation of facilities, etc.
Items related to the operation of offices and facilities	Operations management	Level of measures at mid-term
	Maintenance and management	Maintenance and inspection items for major facilities

Scoring standard: scores are set so that the total for essential items and general items is 100. Extra points are added if additional items are applicable.
・Total score of 80 or more: level for certification as a top-level installation
・Total score of 70 or more: level for certification as a near-top-level installation

Tokyo-ETS (6)

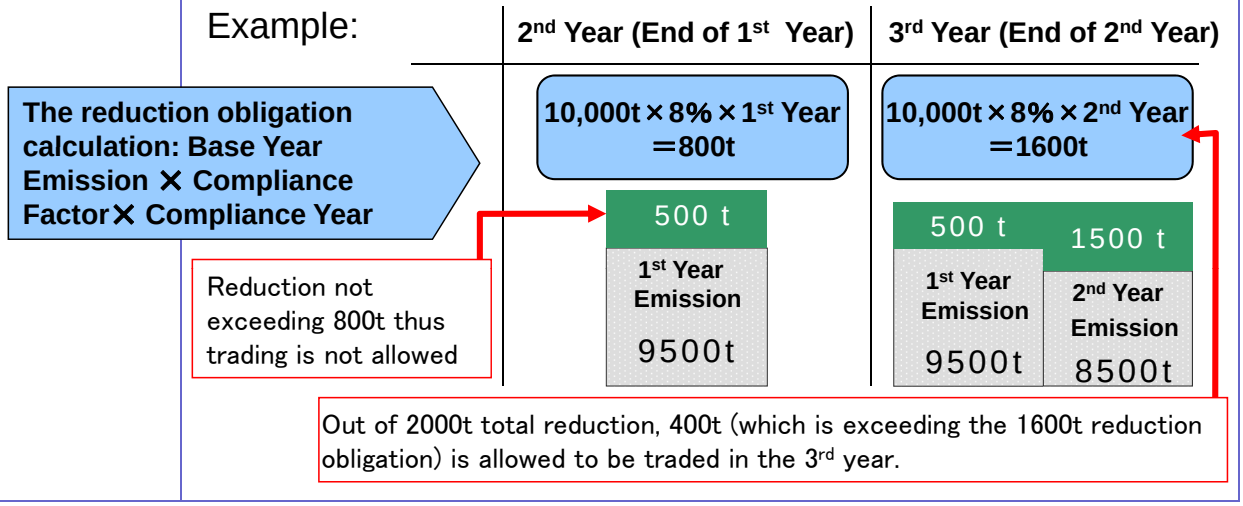
Emissions trading mechanism

Trading Amount: Reduction exceeding the obligation

Emission reduction exceeding the yearly obligation may be traded from the 2nd year.

System allowing facilities that took excessive reduction measures to sell the reduction amount before the end of the compliance period

Example:



TOKYO METRORPOLITAN GOVERNMENT

Tokyo-ETS (7)
Offsets

Offsets	**1. Emission reductions from small and midsize facilities within the Tokyo area** * Emission reduction by energy-saving measures * Buyer can buy necessary amount without limit **2. Renewable Energy Certificates** * Solar (heat and light) energy, wind energy, geothermal energy, hydropower energy (under 1000kW), biomass energy (biomass rate 95% or above) **3. Emission reductions outside the Tokyo area** * Coverage: large facilities with less than 150 thousand ton base year emission * Large facilities will be assumed to be covered under the Tokyo Cap-and-Trade Program, and reduction exceeding the reduction obligation would be counted as offset credit * Buyer can only buy up to 1/3 of base year emission

TOKYO METROROLITAN GOVERNMENT

Tokyo-ETS (8)

Duty of tenants	● All tenants have the obligation to check their CO_2 emission and to implement emission deterrent measures ● All tenants have the obligation to cooperate with the emission reduction measures taken by building owners ● Specified tenants* are required to submit their own emissions reduction plan to TMG via building owners *Specified tenants: Tenants with over 5000m² floor area usage, or over 6 million kWh electricity usage per year

TOKYO METROROLITAN GOVERNMENT

Tokyo-ETS (9)

Monitoring, Reporting, Verification	**Participants are required to report their verified emissions to TMG annually based on "TMG Monitoring / Reporting Guideline" and "TMG Verification Guideline"** ＊Verification by a verification agency certified by the Governor is necessary for monitoring and reporting emissions. ＊The Measurement Act of Japan mandates energy suppliers to use measurement gauges examined and certified pursuant to laws. The Guidelines for Monitoring Greenhouse Gases stipulate that the energy consumption shall be monitored and verified based on a consumption certificate that indicates the consumption measured by such measurement gauges, as well as bills and receipts. ＊A primary list of registered verification agencies will be publicized at the end of August.
Banking/borrowing	**Banking is allowed. Borrowing is not allowed**
Penalty for non-compliance	**Required to reduce 1.3 times the shortage** Violation to the order: Monetary fine will be imposed (About 500 thousand yen), fact of violation will be released to the public, and the Governor will buy the allowance credit for shortage with payment cost charged to the violating installation.

TOKYO METROROLITAN GOVERNMENT

Progress Toward Introduction of Tokyo-ETS

FY 2009	
End of June – early July	Briefing for facilities coming under the cap (around 4,600 individuals participated)
End of July – early August	・Briefing for organizations wishing to serve as verification agencies (around 230 organizations participated) ・Briefing on monitoring and verification guidelines (around 2,000 individuals participated)
Mid July	Seminar for chief verification personnel (around 660 individuals participated)
From August 3	Consultation desk (help desk) available
End of August	Primary list of registered verification agencies published
End of October	Facilities that are likely to come under the cap submit energy consumption data for the previous year
FY 2010	
End of September	Deadline for applications on base-year emissions
End of November	Deadline for submitting Plan on Measures against Global Warming (to be submitted by the end of November each year)
End of FY 2015 : Status of performance of total reduction obligations is confirmed	

TOKYO METROROLITAN GOVERNMENT

Measures Newly Started by the Regulated Facilities

- Group companies started to discuss the possibility and the method to use offset credits from small and midsize facilities within the Tokyo area, in order to achieve the reduction obligation of the large facilities
- Discussion between the building owners and the tenants started to share necessary emission reduction amounts.
- Consultation for producing possible emission trading credits has started.

TOKYO METRORITAN GOVERNMENT

International Relations

- **ICAP*** (International Carbon Action Partnership)

*Open forum comprised of public authorities and governments that have established or are actively pursuing carbon markets through mandatory cap and trade systems with absolute caps

- TMG became the formal member of ICAP in May, 2009
- First to join from Asia
- Introduce Tokyo Cap-and-Trade Program as an urban city model to establish low carbon societies around the world

Other ICAP Members (29 Countries and States)

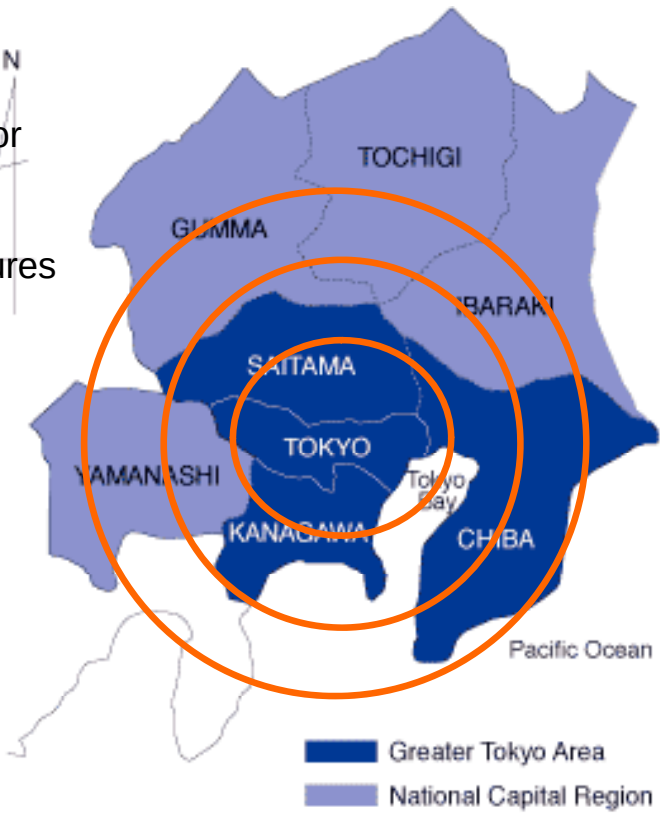
Europe	EC, United Kingdom, France, Germany, Denmark, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Norway
Oceania	New Zealand, Australia
USA States	California, New York, Maine, Maryland, Massachusetts, New Jersey, Arizona, New Mexico, Oregon, Washington
Canadian States	British Columbia, Ontario, Quebec, Manitoba
Asia	Tokyo Metropolitan Government

TOKYO METRORITAN GOVERNMENT

Expansion of the Tokyo-ETS

•Enhance collaborative action within national capital region

・Fifty-one local governments, accounting for 80% of the local (prefectural・ordinance-designated city) governments of Japan, participated in the seminar on policy measures organized by TMG.



Tokyo's Proposals on Nationwide Introduction of Cap-and-Trade Program in Japan

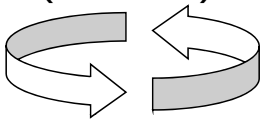
- In September 2009, Japan's new Prime Minister Yukio Hatoyama declared to reduce the country's GHG emissions 25% below 1990 levels by 2020.
- Welcoming this declaration, TMG, the first sub-national government to introduce cap-and-trade program in Asia, announced a proposal in November 27th to encourage Japanese government to realize a nationwide cap-and-trade program in Japan.

In this proposal, TMG requires the following points;

- Introduction of a **mandatory cap-and-trade program with an absolute cap**, not an intensity-base target.
- Designing the program that will correspond to the global standards **for future possible links with other national carbon markets**.
- Active engagement of **both the national and sub-national governments.**

Outline of the proposed nationwide cap-and-trade program

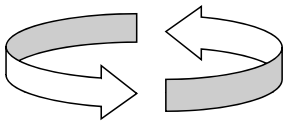
National Level
Cap-and-Trade Program
(NLCTP)



※ Links with other national carbon market in the future

+

Regional Level
Cap-and-Trade Program
(RLCTP)



※Domestic market

- **Target : Super large-scale energy and resource suppliers such as power plants and steel plants. (About 500)**
- **About 50% of domestic CO2 will be covered.**

- Target : large scale facilities such as factories, office buildings and public facilities (About 14000)

＊Prefectures and major cities shall manage this program

◆**The nationwide cap-and-trade program shall consist of two sub-programs based on the national law.**
◆**These programs will cover at least 60% of total domestic CO2 emissions.**

Tokyo Climate Change Strategy

http://www.kankyo.metro.tokyo.jp/

Contact us:tokyoets@kankyo.metro.tokyo.jp

March 2010

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Tokyo Cap-and-Trade Program:

Japan's first mandatory emissions trading scheme

Emission Cap and Trade Section,
Urban and Global Environment Division,
Bureau of Environment, Tokyo Metropolitan Government
2-8-1, Nishi-Shinjuku, Shinjuku-ku, Tokyo, JAPAN 163-8001

http://www.kankyo.metro.tokyo.jp/kouhou/english/index.html
tokyoets@kankyo.metro.tokyo.jp

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