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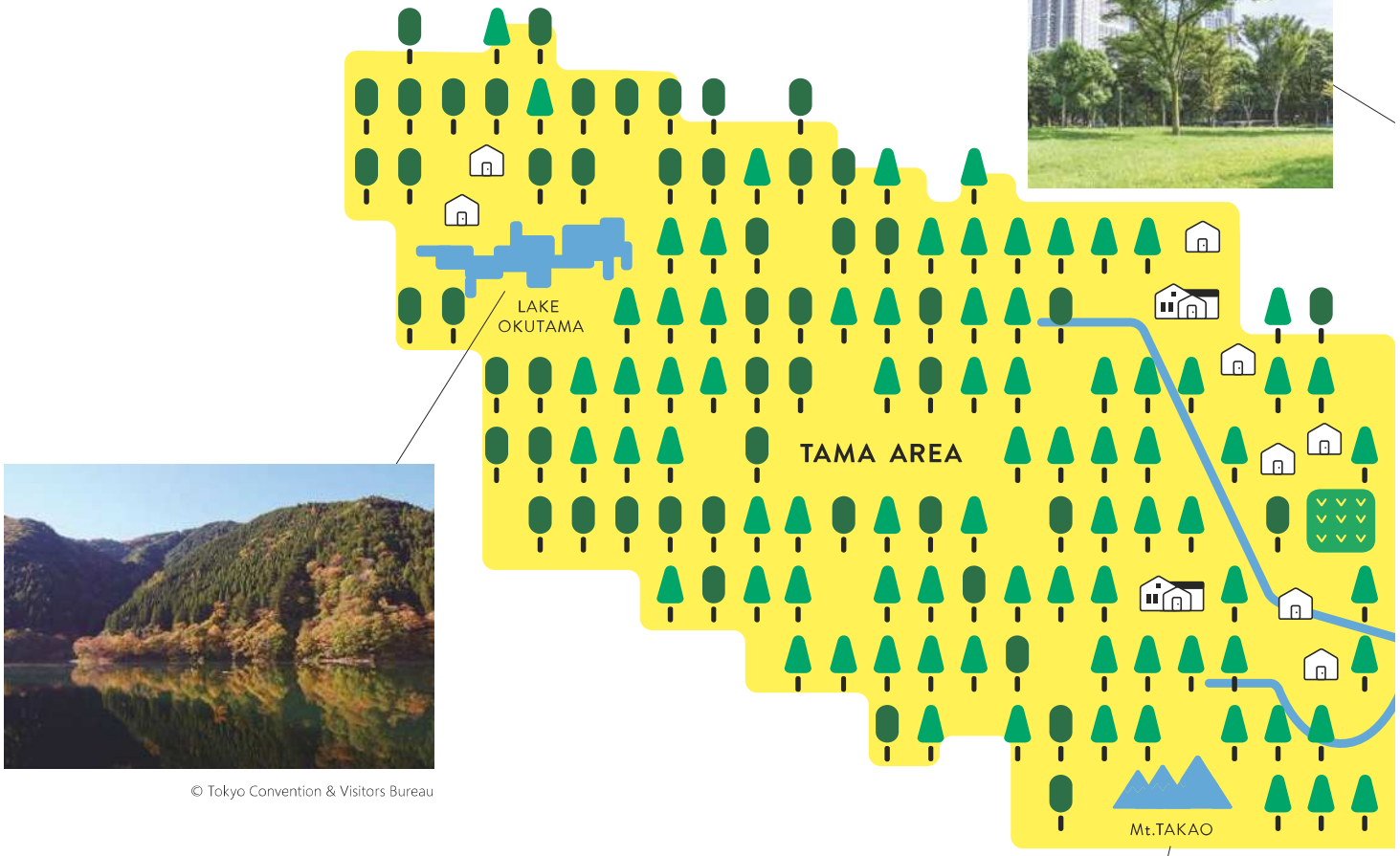
Cover photo: Scenery of Tokyo Metropolis

TOKYO DATA



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PROFILE OF TOKYO

Area (2022) — **2,194** km²

Population (December 2022) — **14.04** million inhabitants

GDP (2020) — **109.6** trillion yen (20.4% of national GDP)

Number of enterprises (2016) — **622** thousand

Number of foreign tourists (2020) — **2.52** million

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ENVIRONMENTAL INFORMATION

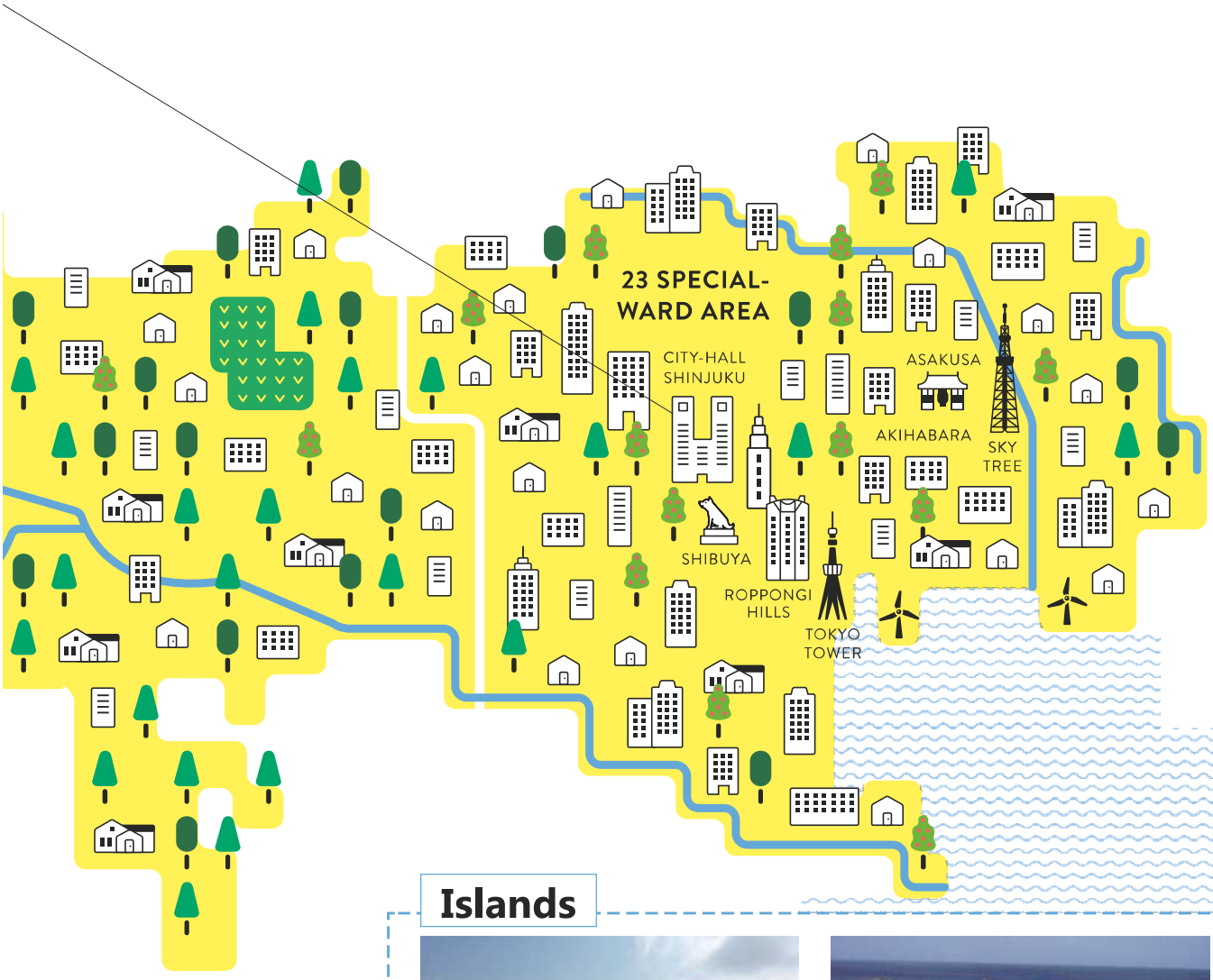
Greenery[*1] (2018) — **52.5**%

Final disposal amount of waste (2021) — **0.62** million tonnes

Energy-related CO_2 emissions (2021 preliminary) — **60.78** million-CO_2 tonnes

Concentration of $PM_{2.5}$ (particulate matter)[*2] (2022) — **9.2** $\mu g/m^3$

*1 Including water area
*2 Annual average of all monitoring stations



Islands

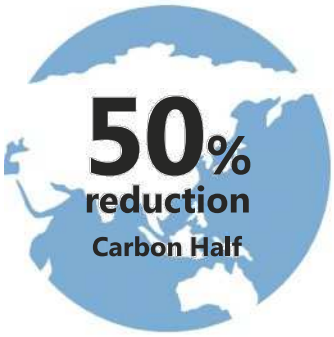

Mt. Mihara, Oshima Island


Minami-jima Island, Ogasawara Islands

Tokyo Metropolitan Government (TMG) has determined policy targets for 2030 to aggressively develop cutting-edge environmental and energy initiatives.

2030 GOALS

GHG emissions

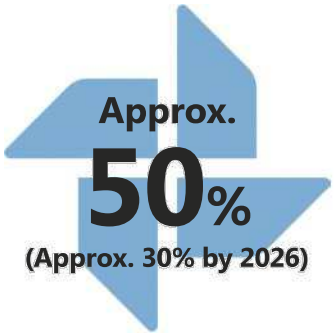


GHG emissions compared to 2000

Energy

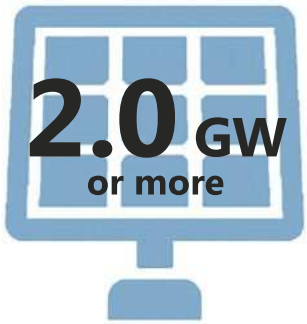
Energy consumption compared to 2000

Renewable energy



Percentage of power generated by renewable energy

Solar power generation

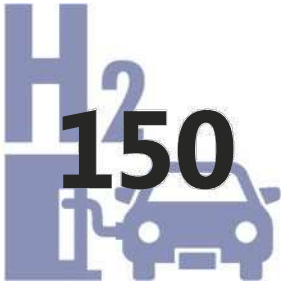


Installation of solar power generation equipment in Tokyo

Automobiles

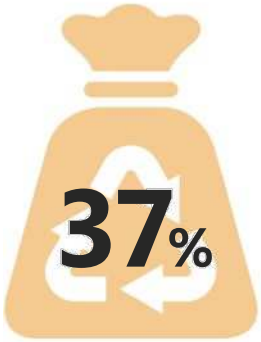
Phasing out the sale of new gasoline-only passenger cars

Hydrogen



Number of hydrogen stations

Recycling



Municipal solid waste recycling rate

Plastics

Incineration of plastics from households and large office buildings compared to FY 2017

Food waste

Food waste compared to FY 2000

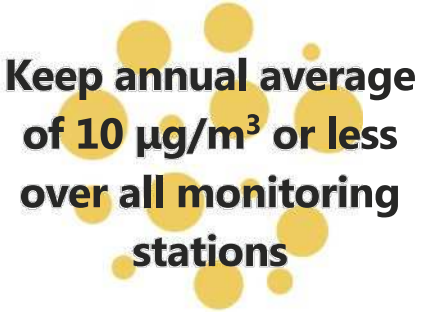
Hydrofluorocarbons

Hydrofluorocarbons (HFCs) emissions compared to FY 2014

Biodiversity

Status of biodiversity

Air quality



PM2.5 concentration

Revision of the Tokyo Environmental Master Plan

Based on the Tokyo Metropolitan Environmental Basic Ordinance, TMG has formulated the Tokyo Environmental Master Plan to comprehensively and systematically promote initiatives for environmental integrity.

In September 2022, we revised the Master Plan for the first time in about six years in order to advance efforts toward the realization of a Green and Resilient Global City Tokyo That Opens up a Future. The new plan sets out specific targets and the shape of initiatives based on the recognition that actions in the period up to 2030 are extremely important to realize the visions for 2050

Developing environmental initiatives through 3+1 Strategies

Strategy 0: Integrated Realization of Decarbonization and Energy Security Spurred on by the Crisis
Strategy 1: Realization of Zero Emissions through Energy Decarbonization and the Sustainable Use of Resources
Strategy 2: Realization of an Environmentally Symbiotic, Prosperous Society that Continues to Benefit from Biodiversity
Strategy 3: Realization of a Better Urban Environment that Ensures the Safety and Health of Tokyo Residents

Responding to the Climate and Energy Crises

Two crises, the climate crisis and the energy crisis, are facing us as evidenced by the further aggravation of extreme weather as well as the prolonged impact of the conflict between Ukraine and Russia from February 2022, posing the need for an integrated realization of decarbonization and energy security.

Accelerating the Social Implementation of Renewable Energy Collaboration with the Renewable Energy Implementation Expert Board

To decisively lead the social implementation of renewable energy, TMG has launched **the Renewable Energy Implementation Expert Board**, a network of experts in the field of renewable energy.

We will work on the social implementation of advanced technologies as well as information dissemination for the expanded use of a variety of renewable energy and resources, such as solar power, wind power, and biomass (SAF).

The first meeting was held on June 19, 2023, where Amory B Lovins, a global authority in the field of environmental energy, delivered a keynote speech and experts gave opinions on the implementation of solar power generation, including perovskite solar cells.

We will help realize the bold implementation of the technology by linking the advice from the expert board to our initiatives.

First meeting of the board

HTT (Ⓗ Herasu (Save), Ⓣ Tsukuru (Generate), and Ⓣ Tameru (Store) Electricity) Initiatives

In order to respond to the climate crisis and ensure a stable supply of energy, TMG is calling for power saving and the installation of solar power generation equipment and storage batteries, using HTT (Ⓗ Herasu (save), Ⓣ Tsukuru (generate), and Ⓣ Tameru (store) electricity) as a keyword.

For the promotion of these efforts, we encourage Tokyo residents and businesses to take action to save power by holding events in collaboration with businesses, advertising in a variety of media, and taking advantage of SNS, posters, and PR items.

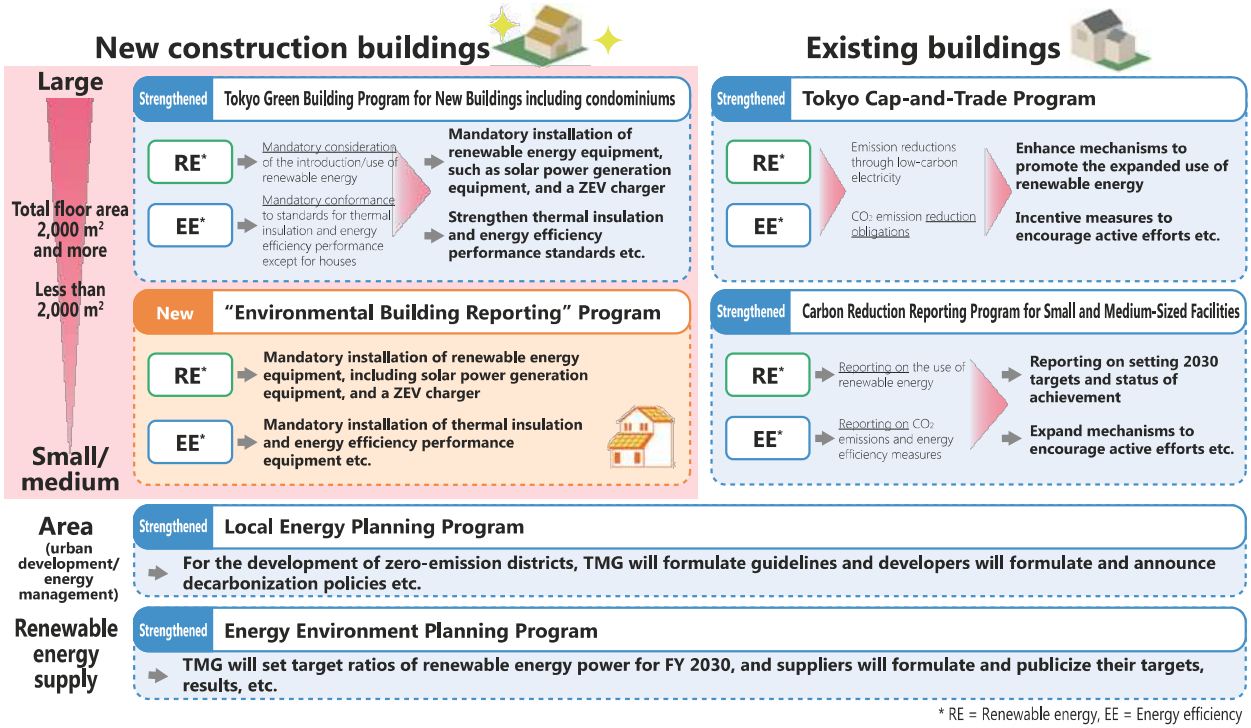
HTT
電力を
へらす
つくる
ためる
Tokyo Tokyo

Event held in collaboration with F.C. Tokyo

HTT posters

Strengthening and Expanding Programs Based on Ordinances

In addition to strengthening and expanding the Tokyo Cap-and-Trade Program and other programs currently in place, TMG will establish a new program for small and medium-sized new buildings, which have so far eluded such institutional framework, in order to decisively promote the decarbonization of buildings in the commercial, industrial, and residential sectors.



* RE = Renewable energy, EE = Energy efficiency

REALIZATION OF A ZERO EMISSION TOKYO

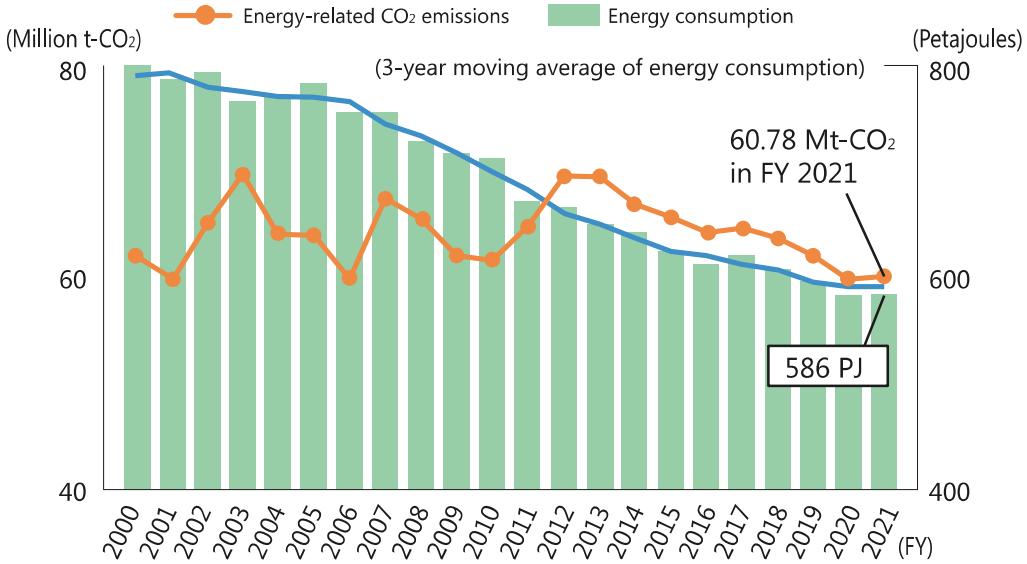
For the realization of a decarbonized society, it is essential to promote drastic transformations in various fields, including energy, urban infrastructure, and resource use.

TMG aims to realize a Zero Emission Tokyo in order to fulfill its responsibility as a major consumer of energy and resources and continue to be a city that achieves resilient and sustainable growth.

Energy Consumption and Greenhouse Gas Emissions in Tokyo

Energy consumption in Tokyo passed its peak around FY 2000 and has been steadily decreasing since then.

Greenhouse gas (GHG) emissions in Tokyo increased after the Great East Japan Earthquake in March 2011, but have been trending downward since FY 2012 because of reduced energy consumption and improvements in the CO_2 emission factors of electricity.



Trend of energy-related CO_2 emissions and energy consumption

Setting of New Sectoral Targets

To promote reduction measures in each sector toward a 2030 Carbon Half, new sectoral targets have been set for energy-related CO_2 emissions and energy consumption.

Energy-related CO_2 emissions

	FY 2020 (preliminary results)	2030
Industrial/ commercial sectors	-7.4%	Approx. 50% reduction
Residential sector	+32.9%	Approx. 45% reduction
Transport sector	-50.7%	Approx. 65% reduction

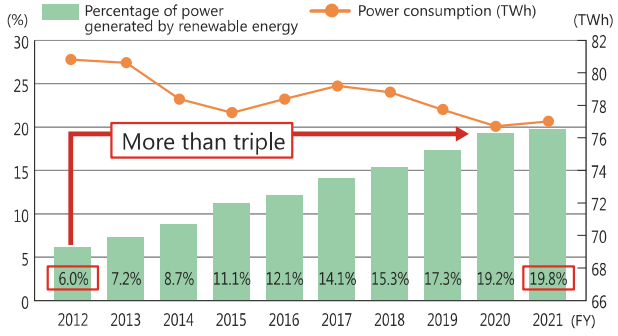
Energy consumption

	FY 2020 (preliminary results)	2030
Industrial/ commercial sectors	-26.7%	Approx. 35% reduction
Residential sector	+9.9%	Approx. 30% reduction
Transport sector	-54.9%	Approx. 65% reduction

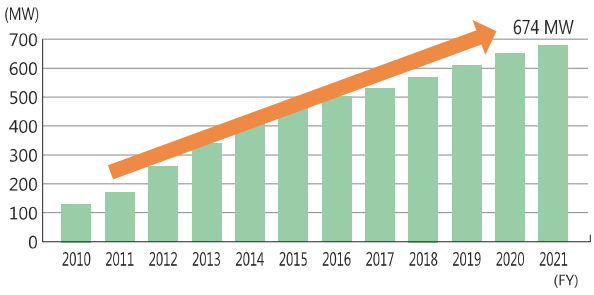
Making Renewable Energy a Major Energy Source

To realize a Zero Emission Tokyo, it is inevitable that we need to further promote energy efficiency and convert from fossil fuels to decarbonized energy, such as renewable energy.

Aiming to decarbonize all the energy used by 2050, TMG will develop efforts focusing on the local production and consumption and expanded use of renewable electricity until 2030.



Use of renewable electricity in Tokyo
(Percentage for FY 2021 is preliminary)



Installation of solar power generation equipment in Tokyo

Local Production and Consumption of Renewable Energy Produced in Tokyo

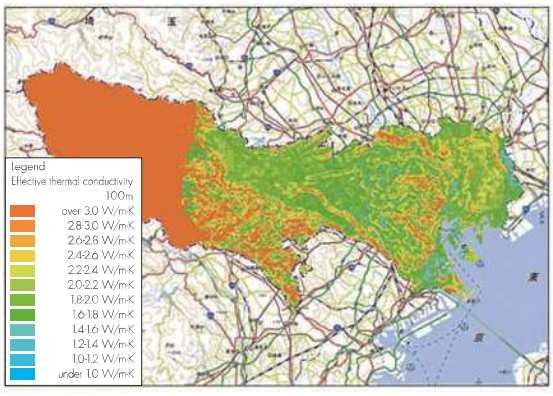
Tokyo rooftop solar register (potential map)

Online information is provided by the Tokyo Rooftop Solar Register, which clearly shows buildings' suitability for solar power generators and other equipment.

Ground source heat potential map

Ground source heat is a familiar renewable energy buried below us.

TMG provides online information on the potential for the adoption of geothermal heat and subsidizes the early stages of adoption.

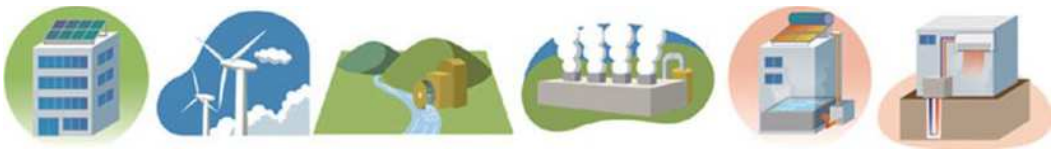


* Potentiality is color-coded with warmer colors indicating higher heat exchange efficiency.

Drastically Increasing the Use of Renewable Power

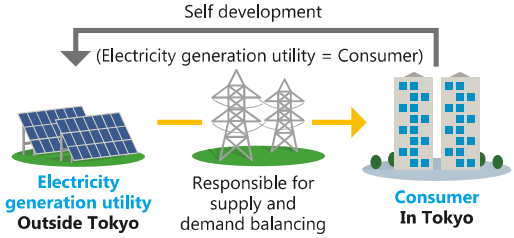
Promoting local production and consumption of renewable energy at facilities

In order to expand the use of renewable energy in and outside Tokyo (within the service area of Tokyo Electric Power Company*), TMG has been implementing the Project for the Local Production and Consumption of Renewable Energy to subsidize facilities of private businesses and municipalities that will install renewable energy power generation equipment, including solar and wind power generation, and heat utilization equipment, including ground source heat and solar heat, with the concept of local production and consumption.
* Other requirements will be applied.

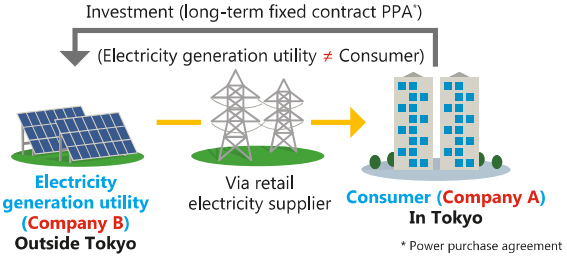


A corporate power purchase leading to the installation of new renewable energy equipment outside Tokyo

TMG supports power purchase that takes advantage of the large demand for electricity in Tokyo and will cause electricity consumers in Tokyo to install new renewable energy equipment outside Tokyo, as limited land area and regional characteristics make large-scale renewable energy equipment difficult to install within the boundaries of Tokyo.



Self-owned model



Third party-owned model

Efforts for electricity suppliers

To improve the environmental properties of electricity supplied to Tokyo, TMG requires electricity suppliers for Tokyo to set targets for renewable energy volume and report the results through the Environmental Energy Reporting Program.

Outline of the Environmental Energy Reporting Program

Targets
✓ Electricity suppliers and power transmission and distribution business operators who supply electricity to Tokyo

Objectives
Improvement of the quality of energy supplied to Tokyo
✓ Reduction of CO_2 emissions
✓ Promotion of the introduction of renewable energy etc.

Environmental Energy Reporting Program
Formulation, submission, and publication every year
✓ Reporting and goals of CO_2 emission factors
✓ Achievements and goals of the introduction of renewable energy etc.

Key points of strengthening the program from April 2024 onwards

✓ Setting target ratios of renewable energy power at 50%
✓ Developing an environment with a wide variety of renewable energy power options to choose from
✓ Enhancing information dissemination by TMG and creating an easy-to-use information database for consumers

Promoting technological innovation

Technological innovation is essential for making renewable energy a major energy source. TMG is promoting the social implementation of renewable energy by supporting the installation of products with features tailored to Tokyo's regional characteristics, such as lightweight and compact panels, and encouraging technological innovation in collaboration with universities and other organizations.

Verification for commercialization of perovskite solar cells

Through a joint research with a developer, Sekisui Chemical Co., Ltd., aimed at commercializing domestic, cutting-edge perovskite solar cell technology, TMG completed Japan's first installation of film-type perovskite solar cells in a sewage facility. On May 24, 2023, we began one of the biggest demonstration experiments in the country.
* The joint research will continue until December 1, 2025.

Morigasaki Water Reclamation Center


Start of verification

Column

You Are Director General, Bureau of Environment, at Home from Today!

For the realization of a 2050 Zero Emission and 2030 Carbon Half, it is important to raise awareness among children and educate them as they will play a major role in any future society, and will encourage behavior change and raise awareness among adults as well.

Since FY 2022, TMG has been conducting the "Director General, Bureau of Environment, at Home" project in which children act as environmental leaders, saving electricity and enjoying other benefits with their family members.

Many children learn about environmental measures and take action with their families through special classes by the governor of Tokyo, bingo games, and Environmental Mandala Chart, with content starting in FY 2023, where they figure out and take environmental actions by themselves.

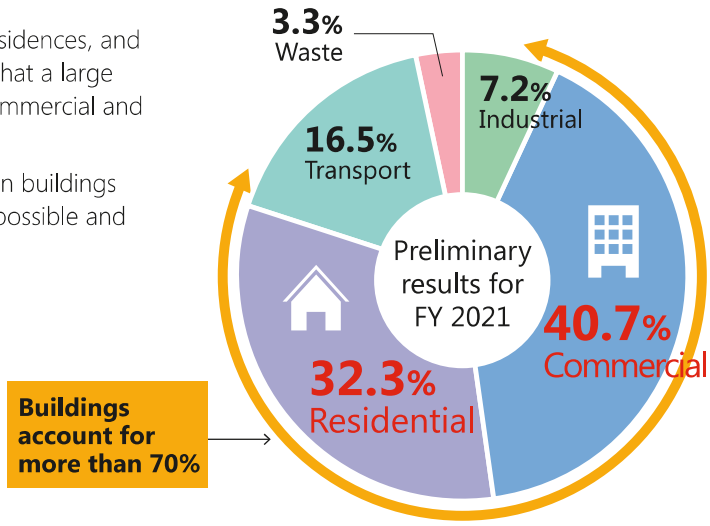

Environmental mandala chart


Special class on HTT by the governor

Expanding Zero Emission Buildings

Tokyo is home to densely built office buildings, residences, and other structures, and is characterized by the fact that a large part of the city's CO_2 emissions come from the commercial and residential sectors.

TMG will accelerate the realization of zero emission buildings by making energy use at buildings as efficient as possible and decarbonizing the energy used at buildings.



Sectoral breakdown of energy-related CO_2 emissions in Tokyo

Strengthening Programs to Accelerate Zero Emission Buildings

TMG has developed effective programs according to building type (new or existing) and size (large or small/medium).

Existing programs to be strengthened toward "Carbon Half"

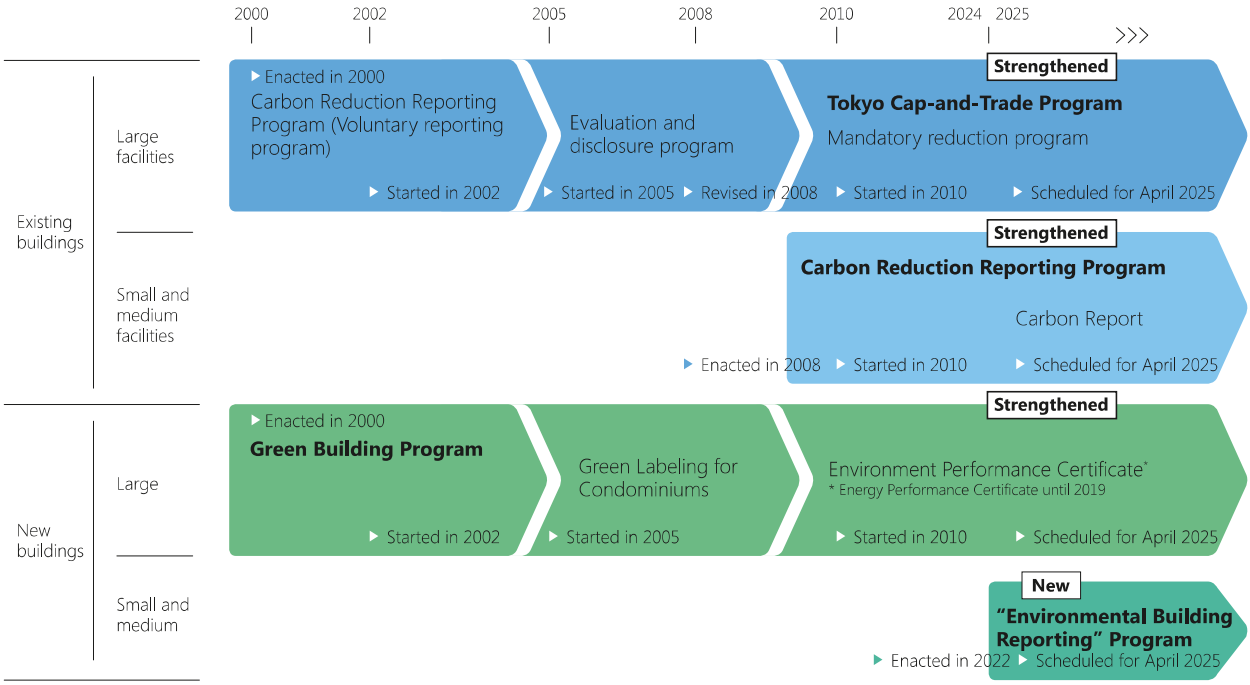
Tokyo Cap-and-Trade Program for large facilities

Carbon Reduction Reporting Program for small and medium-sized facilities

Green Building Program for New Buildings for buildings of a certain size, which are newly built, expanded, or renovated

New program to be introduced in April 2025

"Environmental Building Reporting" Program which requires certain small and medium-sized new buildings to install renewable energy equipment, including solar power generation equipment



Green Building Program for New Buildings

Based on its ordinances, TMG has been implementing the program to require owners who build large buildings to submit a Building Environmental Plan. An outline of the plan is then made public by TMG.

Since FY 2020, TMG has expanded the program coverage from buildings with a total floor area of more than 5,000 m^2 to include those of at least 2,000 m^2 and introduced ZEB (Net Zero Energy Building) Evaluation as the highest rank in the energy efficiency assessment.

Green Labeling for Condominiums
Condominium owners are required to display the environmental performance label on their sales and rental advertisements.

Outline of the Green Building Program for New Buildings

Targets

✓ Building owners who construct buildings, including new constructions, renovations, or extensions, with a total floor area of at least 2,000 m^2

Key points of strengthening the program from April 2025 onwards

Thermal insulation and energy efficiency performance standards

✓ Raise existing thermal insulation and energy efficiency performance standards (except those for houses) to above the national standards
✓ Establish new standards for houses

Renewable energy installation standards (solar power generation equipment)

✓ Require the installation of renewable energy equipment, such as solar power generation equipment
- Installation standard capacity (kW) = Total floor area of building (m^2) x Installation standard rate 5% x 0.15 (kW/m^2)
- Determine lower and upper limits for the renewable energy installation standards

✓ Require on-site installation in principle, but allow off-site installation or the procurement of renewable electricity under certain conditions

ZEV charging equipment standards

✓ Require new buildings with a certain minimum number of parking spaces to install chargers, piping, etc.

Others

✓ Strengthen and expand criteria to evaluate the efforts of building owners who take on high-level challenges
✓ Add evaluation items related to consideration for reducing environmental load associated with construction
✓ Strengthen and expand the display of environmental performance and the content of explanations given to building users by building owners as well as enhancing the information published by TMG to encourage the selection of environmentally friendly buildings

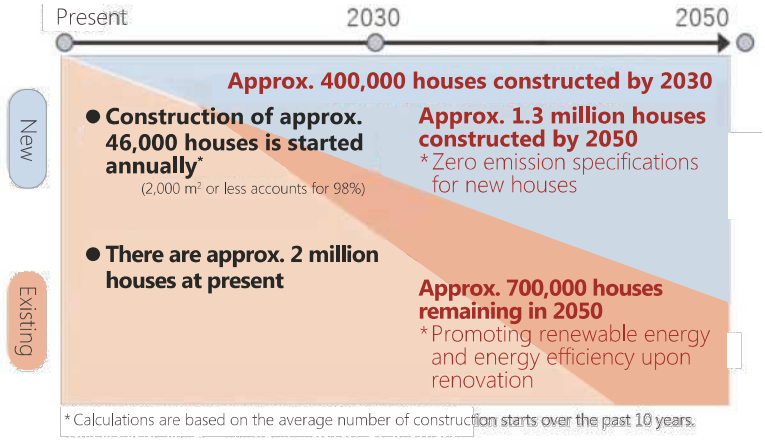
Establishment of the "Environmental Building Reporting" Program

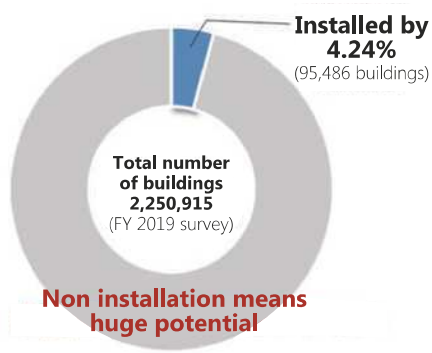
The status of houses in Tokyo and the background of the establishment of the program

Roughly 70% of all CO_2 emissions in Tokyo are caused by the use of energy at buildings.

It is extremely important to take measures for new buildings as they will shape the Tokyo of 2050. It is expected that about half of all existing buildings (70% of which are houses) will be replaced by new buildings by that year.

TMG will make the most of the huge potential of the metropolis of Tokyo's rooftops as the installation of solar power generation equipment on residential roofs in the city has been limited until now.





Outline of the "Environmental Building Reporting" Program

The program will mandate or encourage major house builders and other businesses to ensure thermal insulation and energy efficiency performance and install solar power generation equipment at small and medium-sized new buildings, including houses.

Through this program, businesses will develop products and services that will fully bring out the benefits of solar power generation, and houses providing high environmental performance with solar power generation equipment will be standardized, increasing options available to Tokyo residents.

Key points of the new program from April 2025 onwards

Who is required to install solar panels?

✓ **The program will cover house builders and other businesses that supply a total floor area of 20,000 m² or more annually in Tokyo**.

✓ **The program coverage includes new buildings**, not existing ones.

✓ In this program, **suppliers responsible for installation will work together with owners of custom-built houses and purchasers of built-for-sale houses** to improve the environmental performance of buildings.

* Businesses that have made application and been approved by the governor will also be able to participate in the program.

What are the benefits?

Economy

Saving on monthly energy bills

When 4 kW is introduced at a new detached house with a monthly electricity bill of about 10,000 yen:

✓ **Economic benefits** of 7,700 yen per month and **92,800 yen per year**

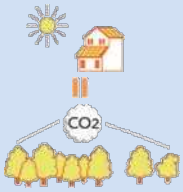
⇒ By using the current subsidy of 100,000 yen/kW, you can **recover** the installation cost of about 1,150,000 yen in **about 8 years!**

* Estimate is based on a household of two or more people living in a ward of Tokyo as of August 2023 and subject to change depending on the circumstances.

Environment

Contribution to CO_2 reduction

✓ The amount of CO_2 reduced by 4 kW of solar power generation is equivalent to the removal by **2,000 m² of cedar forest, or approximately 200 cedar trees**.



Disaster preparedness

Electricity available during power outages

✓ You can collect information and confirm the safety of people on your TV or smartphone in the event of a power outage.

✓ You can increase disaster preparedness by adding a storage battery.

What are the trends in mandatory solar power generation in overseas cities and local governments in Japan?

EU **European Solar Rooftops Initiatives**	● Accelerating the introduction of renewable energy by raising the 2030 Target from 40% to 45% ● Proposal to mandate the installation of solar power generation equipment with the following schedule and targets: - All new public and commercial buildings with a floor area of at least 250 m² by 2026 - All existing public and commercial buildings with a floor area of at least 250 m² by 2027 - All new houses by 2029
Germany **(Mandatory solar power generation promoted by state governments)**	● State governments are introducing an ordinance mandating solar power generation, with regulations differing among states ● The State of Berlin has mandated the installation of solar power generation equipment at houses since January 1, 2023 - Applicable to all new construction and the renovation of roofs over 50 m² on existing buildings * There are some exceptions for existing buildings. 7 out of 16 states in Germany have introduced mandatory solar power generation
California, USA	● A state law to increase the percentage of power generated by renewable energy to 60% by 2030 has been in effect since 2018 ● The installation of solar power generation equipment has been mandated for all new low-rise houses in the state since 2020 - Mandatory for building owners and constructors of detached houses and apartment buildings of at least three stories - Mandatory standards taking into account housing sizes and climate classification - Exempting houses in the shade or without sufficient roof space ● The mandatory installation has been expanded to almost all non-residential buildings and apartment buildings except low-rise ones since 2023
New York City, USA	● A plan to increase the percentage of power generated by renewable energy to 70% by 2030 was approved in 2019 ● The installation of solar power generation equipment or greening has been mandated for new buildings and those undergoing major roof renovations since 2019 - Obligations are determined according to the slope and area of roofs - This does not apply in regulated areas or to roofs used for stormwater management, terraces, or entertainment purposes
Local governments in Japan	Kyoto Prefecture/Kyoto City: Installation has been mandatory for building construction and retrofits of existing buildings with a total floor area of at least 300 m² since 2022 Gunma Prefecture: Installation has been mandatory for building construction and retrofits of existing buildings with a total floor area of at least 2,000 m² since April 2023 Kawasaki City: Installation in new buildings has been mandatory since April 2025

Column

Collaboration agreement regarding the expanded use of solar power generation

In June 2023, the Tokyo Metropolitan Government, Kawasaki City, and the Japan Photovoltaic Energy Association concluded a collaboration agreement regarding the expanded use of solar power generation. We have been working together to disseminate information on and raise awareness of the new program and gather information on the latest technology since then.

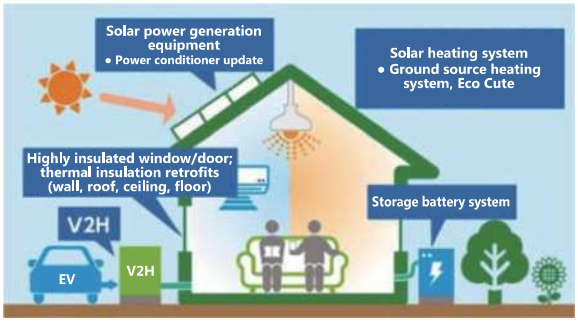
Tripartite collaboration agreement regarding the expanded use of solar power generation

Initiatives to Encourage the Expansion of Zero-Emission Buildings

Improving energy efficiency performance and promoting the introduction of renewable energy at houses in Tokyo

TMG will encourage improvements in thermal insulation and the installation of solar power generation equipment at houses in Tokyo to promote the spread of thermally insulated solar homes that are resistant to disasters and contribute to the health of residents.

✓ Add subsidies for the installation of solar power generation equipment alone and additional subsidies for functional PV (photo voltaic systems), such as Eco Cute that uses solar power



Supporting the supply and development of houses compliant with the new program

Before the start of the "Environmental Building Reporting" Program, TMG provides support to businesses preparing for its implementation and actively encourages those taking proactive steps before the program comes into effect.

✓ Encourage the expansion of housing models with high environmental performance by house builders, and support efforts of local contractors to improve design and construction techniques
✓ Provide comprehensive subsidies for solar power generation equipment, and support planned efforts by businesses
✓ Provide careful support according to the life cycle of solar power generation equipment, such as holding seminars, dispatching instructors, and offering telephone consultations

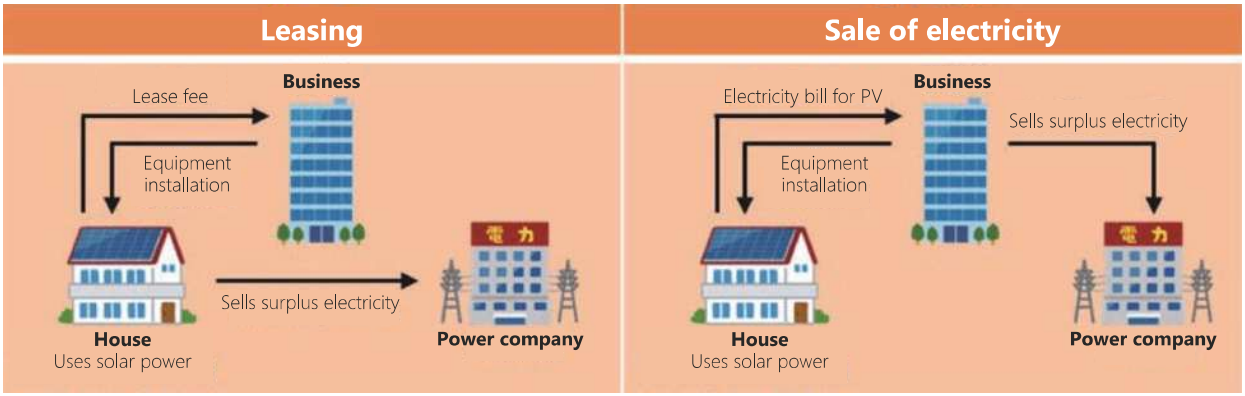
Promotion of Tokyo Zero Emission Houses

To ensure the expansion of houses with high environmental performance which take into account the regional characteristics of Tokyo, TMG subsidizes newly built Tokyo Zero Emission Houses that meet its standards according to their performance levels.

東京ゼロエミ住宅
TOKYO ZERO EMISSION HOUSE

Promoting the installation of solar power generation equipment etc. with no setup costs

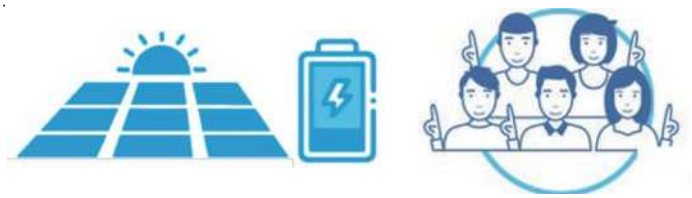
TMG will encourage the installation of solar power generation equipment and storage batteries in Tokyo by subsidizing part of the costs incurred by businesses that install them without setup costs and reducing service charges paid by homeowners.



Example of a scheme without setup costs

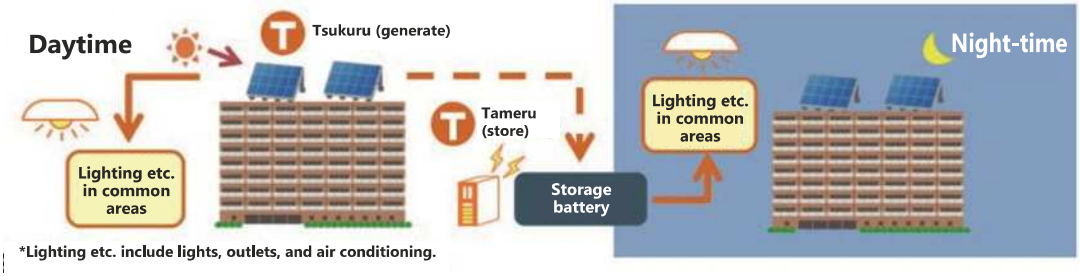
Expanding the group buying of solar panels and storage batteries

To reduce the burden on Tokyo residents for introducing solar power generation equipment and storage batteries, TMG encourages the creation of opportunities to use renewable energy by building a mechanism which allows businesses with an agreement with TMG to recruit prospective purchasers and helps reduce purchase prices by means of economies of scale through group buying.



Promoting the use of renewable energy at apartment buildings

For the expanded use of renewable energy, it is necessary to promote its introduction in condominiums, which account for 70% of all housing in Tokyo, but there are challenges specific to such structures, such as limited space for installation or a need for waterproofing work or the installation of integrated power receiving equipment. In order to lower these hurdles, TMG provides overall support ranging from building consensus among residents to the introduction and operation of equipment, promoting the switch to renewable electricity.



Promoting zero emission action at home through zero emission points

TMG provides Tokyo Zero Emission Points, which can be exchanged for gift certificates and LED discount coupons, to Tokyo residents who have replaced their home appliances, such as air conditioners, refrigerators, water heaters, and LED lighting fixtures, with high energy efficiency models.

We also give advice on energy efficiency to those who have replaced the appliances to further improve their awareness of energy efficiency.

Column

Platform for promoting energy efficient and renewable energy-oriented houses

For the realization of a 2030 Carbon Half, TMG, housing-related organizations, and their member businesses have been operating the Tokyo Metropolitan Platform for Promoting Energy Efficient and Renewable Energy-Oriented Houses since June 2022 to promote the expansion of such houses.

We will promote the decarbonization of houses by sharing information with organizations participating in the platform as well as helping the participators raise awareness among Tokyo residents, set up a help desk, and improve the technical capabilities of businesses.

The World's First Urban Cap-and-Trade Scheme for Large Facilities

In April 2010, TMG started the Tokyo Cap-and-Trade Program targeting large facilities. It is not only the first cap-and-trade scheme in Japan, but also the world's first urban cap-and-trade scheme that also covers the commercial sector including office buildings concentrated in large cities.

The total emissions from facilities covered by this program account for approximately 40% of the emissions from the industrial and commercial sectors in Tokyo.

Covered facilities must reduce a specified amount by implementing emission reduction measures on their own or conducting emissions trading.

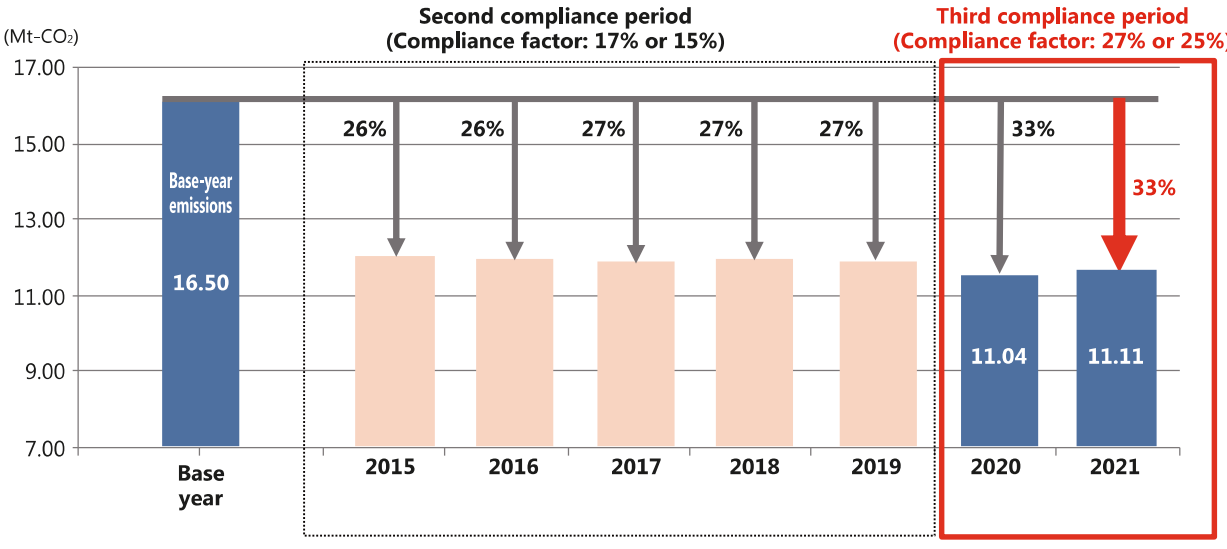
They are also required to calculate, verify and report emissions.

Program summary

Covered facilities	Approximately 1,200 facilities which annually use at least 1,500 kL of energy in terms of crude oil equivalent
Applicable gases	Energy-related CO_2
Compliance periods	5 years 1st compliance period: FY 2010 - 2014 2nd compliance period: FY 2015 - 2019 3rd compliance period: FY 2020 - 2024
Compliance factors	1st compliance period: 8% for office buildings etc. and 6% for factories etc. 2nd compliance period: 17% for office buildings etc. and 15% for factories etc. 3rd compliance period: 27% for office buildings etc. and 25% for factories etc.
Emissions trading	Excess emission reductions and offset credits can be traded
Penalties	Order for Action (reduction of 1.3 times the shortage), monetary fines (up to 500,000 yen), and/or disclosure of violations

Achieving a 33% Reduction Compared to Base-Year Levels in FY 2021

In FY 2021, CO_2 emissions from covered facilities totaled 11.11 million tonnes, a 33% reduction from the base-year emissions, due to progress in energy efficiency measures and the use of low-carbon electricity and heat.



* Values as of February 6, 2023
(Emission factors for electricity etc. have been fixed at 0.489 t-CO_2/MWh in the second and third compliance periods)

Emission reductions during the second and third compliance periods

Cap-and-Trade Program in Its Fourth Compliance Period from FY 2025 to 2029

In the fourth compliance period with an eye on a 2030 Carbon Half and Zero Emission Tokyo beyond that, TMG will encourage further evolution in efforts of large facilities by promoting additional reductions through the further pursuit of energy efficiency measures and expansion of the use of renewable energy.

Key points of strengthening the program (determined by the resolution at the third regular meeting of the Tokyo Metropolitan Assembly in 2023)

- Present new compliance factors, 50% for office buildings etc. and 48% for factories etc.
- Expand means of fulfilling reduction obligations through renewable energy, such as introducing renewable energy from outside facilities
- Strengthen the top-level facility certification system to evaluate efforts toward zero emissions
- Expand reporting and publication of energy efficiency and renewable energy initiatives to improve evaluation of facilities actively working on them

Carbon Reduction Reporting Program for Small and Medium-Sized Facilities

TMG introduced the Carbon Reduction Reporting Program for Small and Medium-Sized Facilities in April 2010 to understand the status of CO_2 emissions from small and medium-sized facilities and promote the implementation of energy efficiency measures. Since FY 2020, we have been motivating businesses to work harder by introducing a mechanism to evaluate and publicize businesses with significant emission reductions or excellent efforts for using renewable energy.

* Values taken from the reports submitted over 12 consecutive years by 14,916 small and medium-sized facilities (Emission factors for electricity etc. have been fixed at 0.489 t-CO_2/MWh in the second and third compliance periods of the Tokyo Cap-and-Trade Program)

Changes in CO_2 emissions and CO_2 emissions intensity

Outline of the Carbon Reduction Reporting Program for Small and Medium-Sized Facilities

Targets

✓ Businesses that have facilities with annual energy consumption of less than 1,500 kL in terms of crude oil equivalent

Key points of strengthening the program from April 2025 onwards (determined by the resolution at the third regular meeting of the Tokyo Metropolitan Assembly in 2023)

✓ TMG determines achievement levels for FY 2030 and businesses formulate plans and report on achievement status

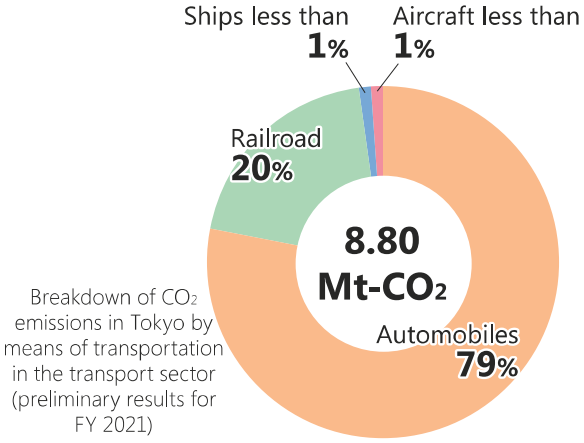
✓ Expand items to be reported and publicized and the evaluation of excellent businesses

✓ Promote the further depiction of measures for businesses by expanding carbon reports

Promoting Zero Emission Mobility

TMG aims to eliminate the sale of new gasoline passenger cars by 2030 and new gasoline motorcycles by 2035 in Tokyo, accelerating the introduction of zero emission vehicles (ZEVs) and the development of infrastructure.

We are also holding events to raise awareness of ZEVs.

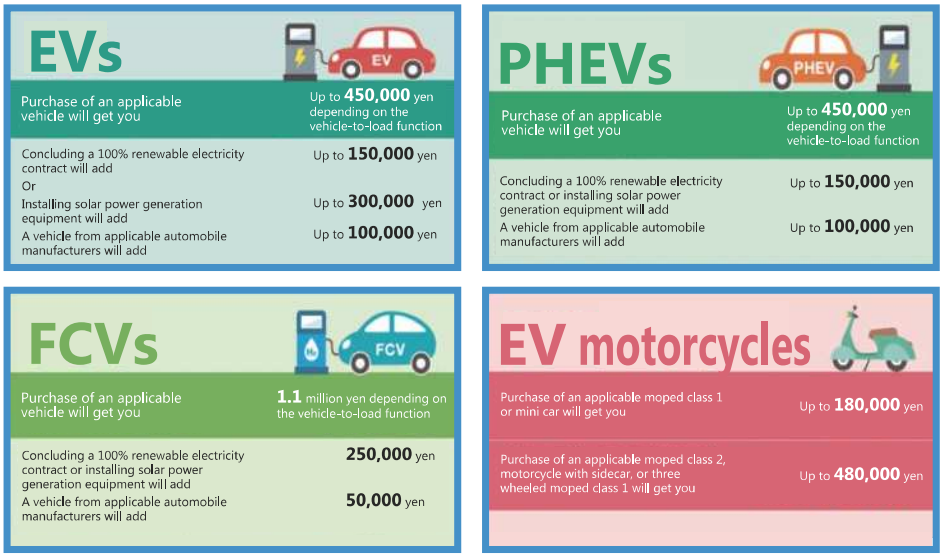


Breakdown of CO_2 emissions in Tokyo by means of transportation in the transport sector (preliminary results for FY 2021)

ZEV-Tokyo Festival

Broader Use of ZEVs

TMG subsidizes the purchase of ZEVs to promote their broader use. In FY 2023, we started increasing subsidies for vehicles from automobile manufacturers that have a certain level of sales of ZEVs and others as an incentive for vehicle model development and sales promotion.



Efficient use of automobiles

Under the Tokyo Vehicle Emission Reduction Program, TMG has mandated that businesses using 30 or more automobiles must submit a plan and results report on reduction targets for exhaust gases and efforts for the rationalized use of automobiles.

Under the Freight Transportation Evaluation System, TMG evaluates truck transportation businesses that promote eco-driving and other initiatives based on actual fuel efficiency to encourage their efforts to reduce CO_2 emissions.

Development of Infrastructure to Support the Expansion of ZEVs

Improving the availability of EV chargers

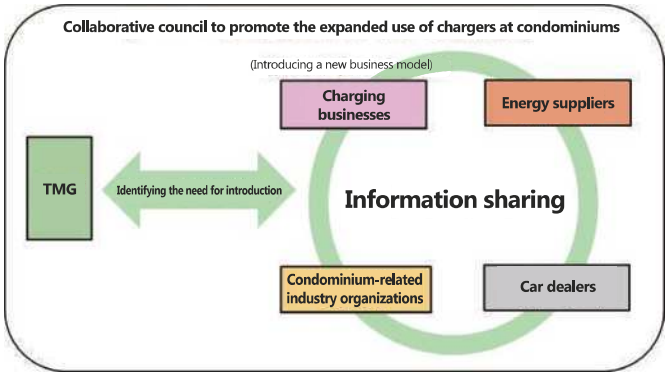
In order to eliminate users' anxiety about insufficient charging opportunities, TMG is promoting the installation of EV chargers as social infrastructure. We are subsidizing installation costs at commercial facilities and other private facilities, and promoting verification in areas with parking meters.

A charger installed along a public road in an area with parking meters

Promoting installation at apartment buildings

While allowing charging at home is important for the full-scale spread of ZEVs, installing chargers at apartment buildings is not as straightforward as it is at detached houses because a consensus needs to be formed among residents.

In addition to subsidizing the cost of installing chargers at condominiums, TMG is identifying the need for the introduction by sharing case examples, know-how, and challenges in collaboration with related organizations and businesses.



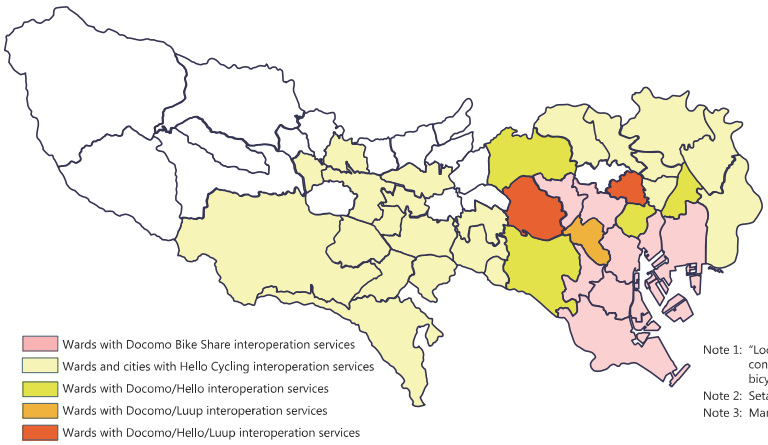
Wall-mounted outlet type

Stand type

Promoting the Use of Bicycles

Since bicycles are a familiar and environmentally friendly means of transportation, we need to improve the safety, comfort, and convenience for bicycle users in conjunction with promoting the use of bicycles. Bicycle sharing is an effective mechanism for promoting the use of bicycles, and is now being developed in various parts of Tokyo. TMG supports the securing of sites for cycle ports and the initial investment made by municipalities, and collaborates with them to ensure the broader use of cycle ports.

Local governments with bicycle sharing as of June 1, 2023



Note 1: "Local governments with bicycle sharing" refer to those that have concluded an agreement with a management company to operate a bicycle sharing service or install cycle ports on public land.
Note 2: Setagaya Ward also implements its own bicycle sharing.
Note 3: Management companies may install their own ports.

Cycle port shared by multiple businesses

Expanding the Use of Hydrogen Energy

Hydrogen is a clean energy that emits only water when used, helping reduce environmental load as well as contributing to a diversified energy mix and response to emergencies.

Hydrogen is expected to be used in a wide range of fields, such as transportation, electricity generation, and heat utilization, and is also promising as a means to balance the supply and demand of renewable electricity. TMG is working to expand the use of hydrogen energy by providing support from various perspectives, such as institutional and financial aspects, and actively promoting the effective use of hydrogen-related technologies.

Formulation of the Tokyo Hydrogen Vision

In order to help understand hydrogen energy, TMG formulated the Tokyo Hydrogen Vision in March 2022. It shows the Tokyo of 2050 with widespread use of hydrogen energy and describes the direction of our efforts for the development of hydrogen initiatives toward the milestone of 2030.

Tokyo Hydrogen Vision

Broader Use of Fuel Cell Vehicles

The use of hydrogen for commercial and industrial vehicles, which travel a long distance and require a lot of energy to power, is crucial for the decarbonization of the transport sector and expansion of hydrogen use.

In 2017, fuel cell buses were introduced into Tokyo metropolitan bus lines, becoming the first commercially available municipal fuel cell buses operated as route buses in Japan. As of the end of FY 2022, a total of 102 fuel cell buses have been introduced, including those operated by private businesses.

In April 2023, fuel cell trucks were introduced in Tokyo. TMG provides support for these buses and trucks.

For other commercial vehicles, such as fuel cell garbage trucks and forklifts, support measures will be taken according to the needs of vehicle types and their development status to promote their introduction.

Fuel cell bus

Fuel cell garbage truck

© CJPT

Fuel cell light truck

© Toyota Industries Corporation

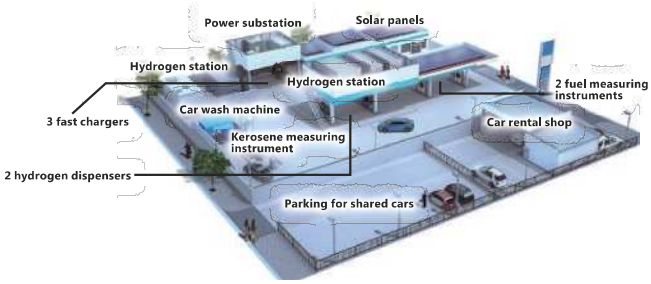
Fuel cell forklift

Promoting the Installation of Hydrogen Stations

Hydrogen stations started operation in Tokyo in 2014 and as of March 2023 have been installed in 23 locations. The key to making full use of hydrogen is to install hydrogen stations as these are a familiar energy supply infrastructure. TMG is subsidizing their installation and operation costs as these are relatively higher than those of gas stations.

In addition, TMG will support the conversion of an existing gas station into an environment-friendly multi-energy station that is also equipped with hydrogen provision facilities and fast chargers.

Bus-capable hydrogen station



Multi-energy station

Building the Foundation for the Use of Green Hydrogen

Most of the hydrogen currently produced is Gray Hydrogen from fossil fuels due to such factors as production costs. We need to aim to expand both supply and demand of Green Hydrogen for which CO_2 is not emitted even during production.

TMG will hold the Tokyo Green Hydrogen Roundtable to discuss related issues with companies making advanced efforts. We will increase cases of utilizing Green Hydrogen in Tokyo, including support for the introduction of pure hydrogen fuel cells, their introduction at TMG facilities, and collaboration with other local governments.

The use of Green Hydrogen produced in Yamanashi Prefecture started at Tokyo Big Sight

Column

Promotion of efforts in ports and the coastal area

TMG will also accelerate its efforts in ports and the coastal area as they are expected to play a major role in realizing a decarbonized society. Based on a public-private partnership, we have formulated the Port of Tokyo Carbon-Neutral Port (CNP) Building Plan to work on the decarbonization of the port by means of hydrogen.

TMG will promote the spread of hydrogen energy among private businesses by creating a model for the utilization of hydrogen energy at buildings in the Tokyo Waterfront City.

Source: Website of Mitsui E&S Co., Ltd.

Electric/FC-driven cargo handling equipment

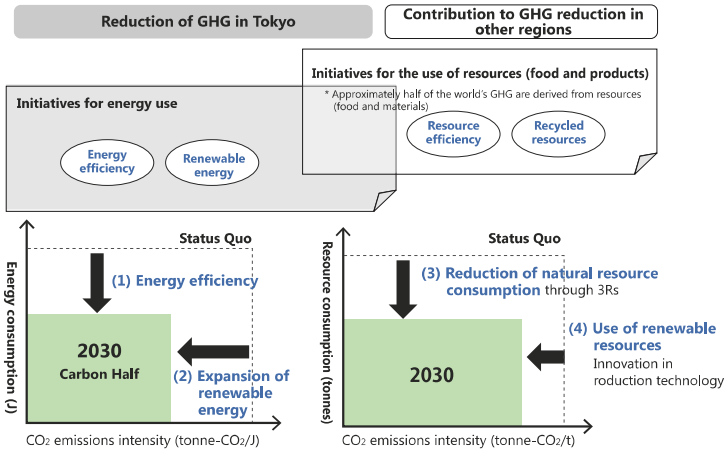
Source: Website of Terasaki Electric Co., Ltd.

Alternative maritime power supply to ships at anchor

Realizing the Sustainable Use of Resources

Relationship between the Sustainable Resource Management and Climate Change Measures

As the existing linear economic model of extracting resources from the earth, making products, and throwing away unwanted items has a major impact on climate change, TMG has been actively working to promote sustainable resource management by positioning it as one of the array of climate change measures in the Zero Emission Tokyo Strategy formulated in 2019. In order to secure the global environment that is the basis for the existence of humans, we have to change the ways to make, sell, buy, and use things to realize the sustainable use of resources with net zero CO_2 emissions.

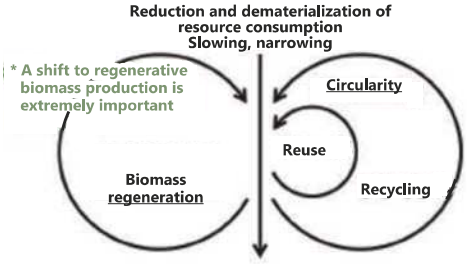


Shift to a Circular Economy

To realize the sustainable use of resources and achieve net zero CO_2 emissions, we need to consider environmental load in the supply chain of products and food.

TMG will help shift to a circular economy by supporting new businesses that incorporate Reduce and Reuse, encouraging the commercialization of innovative recycling technologies, and promoting the improvement of recycling systems.

Concept of circular economy

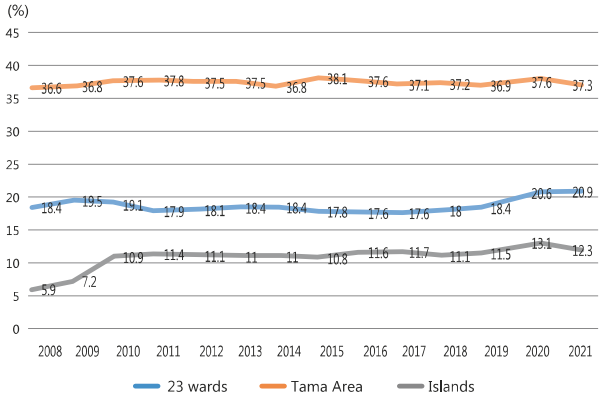


Status Quo of Waste Recycling in Tokyo

Municipal solid waste recycling rates have been almost flat since 2010. However, recycling rates vary by region. In the Tama Area, where recycling is being promoted by controlling the amount of disposal by charging for household waste and through strict separation of waste, the municipal solid waste recycling rate has reached 37%.

The amount of industrial waste recycled in Tokyo was on an upward trend but has been on a downward trend since FY 2016. When viewed by type, there is an increase in the amount of recycled debris, construction sludge, and the like discharged from construction work.

Changes in recycling rates in Tokyo

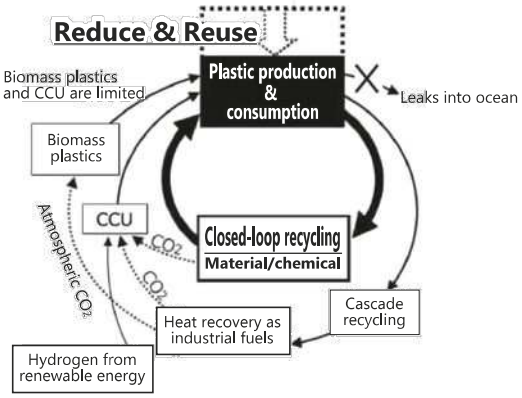


Measures for Plastics

New ways of using plastics

While plastics have excellent properties, they affect climate change and biodiversity loss throughout all stages from production to disposal.

TMG will realize a "carbon closed cycle," which represents the sustainable use of plastics with net zero CO_2 emissions, by mainstreaming 2R businesses, including selling by weight, sharing, and reusable containers, and implementing closed-loop recycling.



Concept of carbon closed cycle

Innovation creation collaborating with businesses

TMG is supporting and working with private companies developing game-changing reuse business models and closed-loop recycling technologies.

Examples of initiatives

Sharing services for reusable drink containers have been gradually implemented in society, mainly at restaurants, convenience stores, and commercial complexes, in order to reduce Re&Go disposable containers and allow reusable containers to be easily used on the street.

Support for recycling plastic containers and packaging

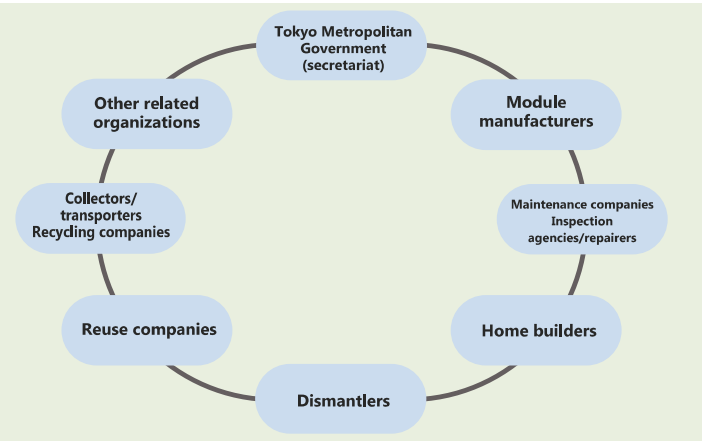
To ensure the separate collection of plastics in municipalities, TMG will provide support for improvement to local governments that have already started a sorting system, and start-up support to those that have not yet implemented the system.

Promotion of 3Rs

Promoting the advanced circular use of solar panels

In September 2022, TMG established the Tokyo Metropolitan Council for Advanced Circular Use of Solar Power Generation Equipment, which is made up of dismantlers, collectors/transporters, recycling companies, etc. In collaboration with the council, TMG is working to build an efficient recycling route for residential solar panels, and is committed to various public relations activities related to solar panel recycling for Tokyo residents and businesses.

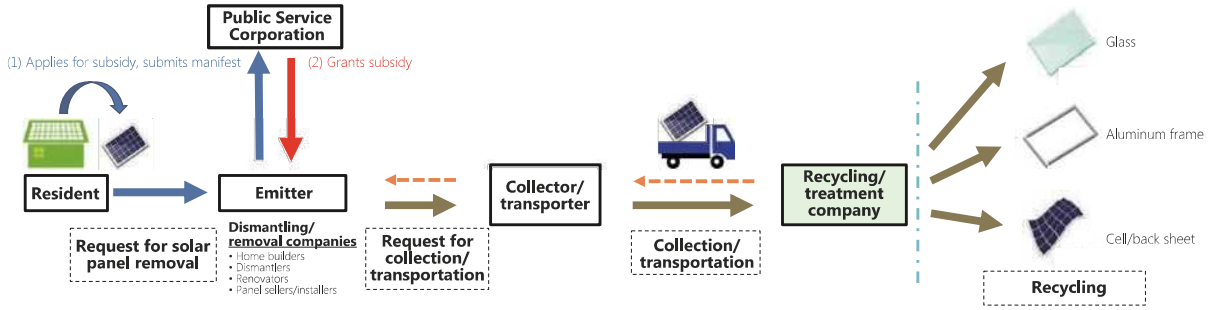
Structure of the council



Instructions for Removing Used Residential Solar Panels (for businesses)

In order to build a recycling route for solar panels, TMG subsidizes part of the recycling costs as they are higher than those for waste disposal by landfill.

We are promoting efforts toward the advanced circular use of solar panels in cooperation with businesses involved in different processes from removal to treatment.

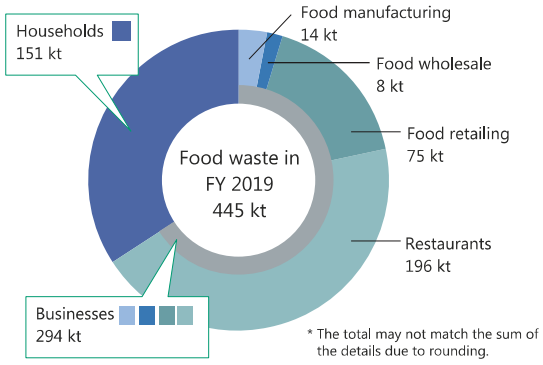


Mechanism for subsidizing recycling costs

Measures for Food Waste

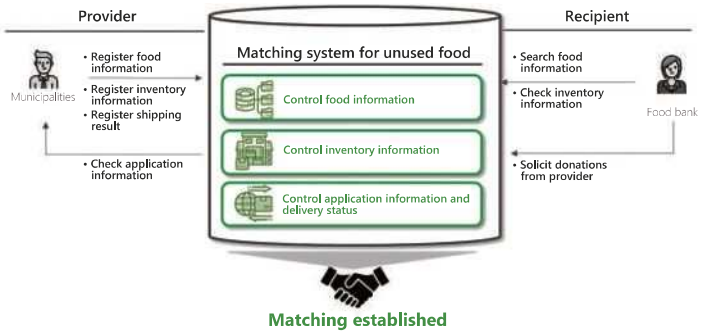
Food waste in Japan is approximately 5.23 million tonnes (2021), which is 1.2 times the amount of food aid provided by the United Nations, approximately 4.2 million tonnes.

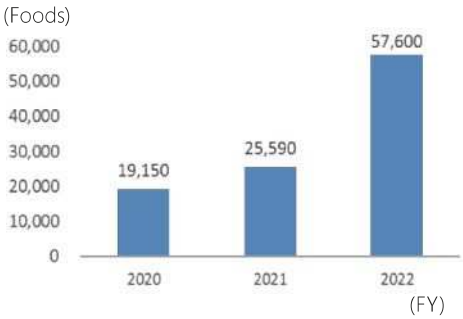
The quantity of edible but wasted food in Tokyo is approximately 450,000 tonnes per year (2019), and approximately 70% of that comes from hotels, restaurants, and other businesses. To halve wasted food by 2030 compared to 2000 levels, TMG formulated the Tokyo Food Loss and Waste Reduction Plan in March 2021.



Establishing and expanding efforts for the effective use of unused food

TMG uses a matching system for unused food to donate emergency food stockpiled at municipalities and TMG to food banks and other organizations. While using the system more extensively, we will establish and expand a distribution model for mutual help by for example sharing information with municipalities and promoting the effective use of emergency food.





Number of matched emergency foods

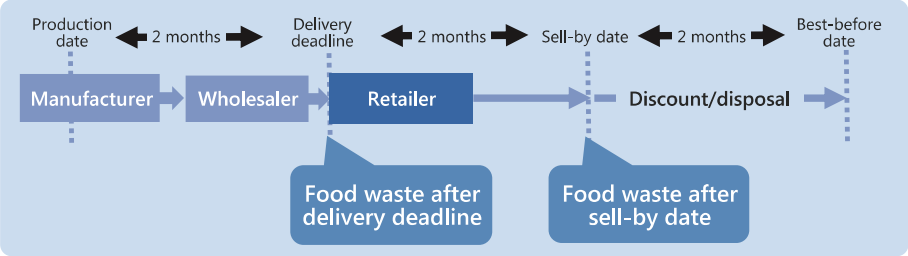
Donating food to children who will lead the future

In order to create a food donation system to protect children who will lead the future, TMG will explore the establishment of a certification body and logistics network for food donations.

Promoting zero-waste behavior for food before its best-before date

There is a business practice called a 1/3 rule in the food distribution process, which limits the deadline of delivery to retailers within one-third of a best-before date. After its delivery deadline or sell-by date, food may be wasted even before its best-before date.

Handling of food with a six-month best-before date



Against this backdrop, TMG will carry out fact-finding surveys of business practices for each business type and raise awareness of consumers by for example encouraging them to take the product at the front of the display.

Fact-finding survey of food waste

Encourage the selecting of front-of-display products

Food waste reduction through Food x Technology

By taking advantage of Food x Technology (a general term for advanced food technology), TMG is working on the social implementation of upcycling food that would once have been discarded into products with new added value.

TMG will promote the highly circular use of food to reduce its waste, helping brew craft beer from emergency food, such as hardtack, which is about to be disposed of, and creating a system to match food companies planning food upcycling with food factories producing such food.

Upcycled beer

Column Making SAF from waste cooking oil

SAF* is a sustainable aviation fuel produced from waste cooking oil, wood, sugarcane, and various other raw materials. It allows greenhouse gas emissions to be significantly reduced compared to conventional fuels.

TMG will foster momentum for the spread of SAF and encourage the construction of a supply chain, implementing joint projects with companies in Tokyo collecting waste cooking oil from which SAF is produced, collaborating with municipalities working to collecting such oil, and providing information about how waste cooking oil can be effectively used as SAF to Tokyo residents.

* Abbreviation for sustainable aviation fuel

Efforts toward Zero Hydrofluorocarbon Emissions

Fluorocarbons have an extremely strong greenhouse effect and cannot be recovered once released into the air. Therefore, TMG will curb the use of new fluorocarbons and eliminate leakage from existing equipment containing fluorocarbons. To achieve zero fluorocarbon emissions, TMG will promote emission reduction measures throughout the life cycle of equipment, from manufacture, use, through to disposal, in cooperation with the national government and businesses.

Preventing Leakage during Use and Disposal

Utilizing advanced technology to reduce fluorocarbon emissions

Reducing leakage during use requires the active utilization of advanced technology, such as the early detection of leakage through constant monitoring using IoT. By means of joint projects with businesses having advanced technology, TMG will verify the reliability, versatility, and power consumption reduction effect of the technology, clarify the benefits of introducing the technology, and encourage its widespread use.

Leakage of fluorocarbons

On-site guidance by fluorocarbon inspectors

TMG is promoting on-site guidance and other efforts by fluorocarbon inspectors.

In November 2021, the first arrests were made after the revision of the Act on Rational Use and Proper Management of Fluorocarbons. The Metropolitan Police Department announced that one of the causes was the businesses' lack of knowledge about releasing fluorocarbons, posing the need to further publicize the Act.

TMG is working to further raise awareness of the Act so that the implementation of appropriate measures for fluorocarbons will become widespread.

On-site guidance by fluorocarbon inspectors

Promoting Climate Change Adaptation Measures

In addition to mitigation measures to reduce greenhouse gas emissions, we need to work on adaptation measures to avoid and alleviate damage due to the impact of climate change. TMG is promoting its initiatives in the relevant fields under the Tokyo Climate Change Adaptation Plan formulated in March 2021.

Climate change adaptation measures and examples of initiatives in five fields

Natural disasters

In response to natural threats, such as floods, inland floods, storm surges, and landslides due to intensified heavy rains and typhoons, TMG will promote the utilization of state-of-the-art technologies and the development of urban facilities in both structural and non-structural aspects.

Example: Development of revetment and regulating reservoirs along rivers

Development of a regulating reservoir along a river (Regulating Reservoir under Kanda River/Loop Road No. 7)

Health

TMG is implementing preventive and ex-post measures to minimize damage to health due to temperature rise, such as patients with heat stroke or infectious diseases and health hazards caused by air pollution.

Example: Creation of cool spots

Example of installation of fine misting devices (OASE Shibaura, Minato-ku)

Agriculture, forestry, and fisheries industries

TMG aims to realize profitable agriculture, forestry, and fisheries industries by providing technical support and guidance to help introduce items and varieties compatible with temperature rise.

Example: Promoting the production and use of flowers and greenery suitable for summer

Supply of summer-resistant flower seedlings at the Tokyo Metropolitan Mizumoto Park in July 2020

Water resources and the water environment

TMG is reducing the risks posed by severe droughts and deterioration of raw water quality as much as possible and enhancing the combined sewer system to create a comfortable water environment.

Example: Conservation and management of water conservation forests

Using drones for on-site investigations

Natural environment

TMG is enhancing efforts to minimize impacts on biodiversity, such as changes in the distribution of organisms, and utilize and restore the functions of the natural environment.

Example: Reforestation in the Tama area

Devastated forest

Good forest several years after thinning

Column

TOKYO Resilience Project

Through the TOKYO Resilience Project, TMG has put together an action plan for tasks that should be tackled as countermeasures against five imminent risks facing Tokyo, and is working to realize a more resilient Tokyo in the 2040s.

Measures against five risks

(1) Preparations for floods and storms, (2) Preparations for earthquakes, (3) Preparations for volcanic eruptions, (4) Preparations for power and communications outages, etc., (5) Creating a city that is also highly prepared for infectious diseases

The project was formulated and then announced on December 23, 2022

Bold Acceleration of TMG's Initiatives for Its Own Sustainability

As a business that consumes a lot of energy and resources, TMG with "Let's Start from Here" in mind is intensifying its efforts to reduce greenhouse gas emissions associated with its own office work and taking the lead in implementing reforms to achieve a 2030 Carbon Half.

Installation of solar power generation equipment at TMG facilities

To make maximum use of the potential of public facilities, TMG is accelerating the installation of solar power generation equipment at its existing facilities in addition to those newly constructed or renovated and will complete the installation at all of its applicable facilities by FY 2030.

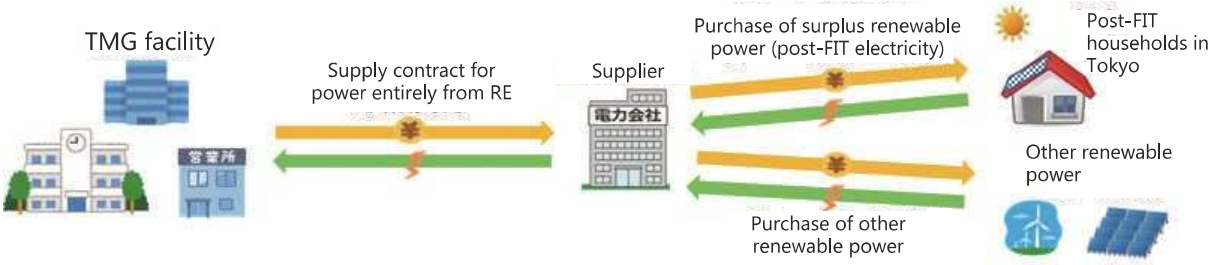
Tokyo Big Sight

Solar carport at Hachioji Water Supply Office

TMG Power Plan

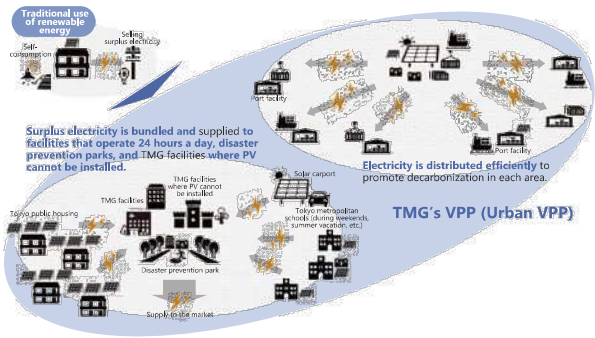
TMG facilities (governor's bureaus/departments) consume approximately 800 GWh of electricity, which is equivalent to approximately 1% of the electricity consumption in Tokyo. Therefore, TMG wants all electricity used at TMG facilities (governor's bureaus/departments) to be sourced from renewable energy by 2030.

Since FY 2019, we have switched electricity supplied to the TMG No.1 Building to power entirely sourced from renewable energy. In addition, since FY 2020, we have been promoting the TMG Power Plan that aggressively uses power entirely sourced from renewable energy at TMG facilities, which includes post-FIT electricity generated by solar power generators at home in Tokyo.



Creation of VPP (virtual power plant) at TMG facilities

TMG is promoting the creation of VPP* at its facilities to make the most of renewable power generated at the facilities by balancing supply and demand between them, with a view to offering balancing energy to the electricity market.



* A system that centrally manages and remotely controls distributed energy resources using IoT-based advanced energy management technology to let them function as if they are a single power plant.

International Contribution and Exchange

TMG will further enhance its initiatives and contribute to the solving of global environmental issues by exercising international leadership as one of the world's largest cities, promoting cooperation with overseas cities, and sharing knowledge and technologies with them. We will improve our international presence by making the most of the benefits of the online environment and strengthening information dissemination and approaches to the rest of the world.

Winning CDP's "Cities A List" award (highest rating) for 2021 and 2022, which evaluates climate change initiatives and information disclosure

Strengthening and utilization of global networks

TMG will deepen cooperation with overseas cities and businesses to achieve common objectives, including climate change measures and the promotion of a circular economy, by strengthening the international promotion system in Tokyo and actively participating in international inter-city network activities, such as C40 (C40 Cities Climate Leadership Group) and ICLEI (Local Governments for Sustainability), as well as international conferences.

C40 Cities Bloomberg Philanthropies Awards Ceremony (C40 Mayors Summit)

Active approaches and contribution to the international community

Through the mutual learning of knowledge and technologies with overseas cities, TMG will further improve its environmental initiatives and share knowledge on its advanced environmental policies with them. We will further contribute to the international community by playing a leading role in international conferences and other occasions to actively help resolve environmental issues.

High-level roundtable at the COP27 Climate Implementation Summit

Improving international presence

Taking advantage of the connections with overseas cities, TMG will disseminate information on its pioneering initiatives, which lead the world in measures for buildings and the expanded use of hydrogen energy. We will strategically develop the climate action movement "TIME TO ACT" from Tokyo, which calls on the world to accelerate effective actions, to improve our international presence.

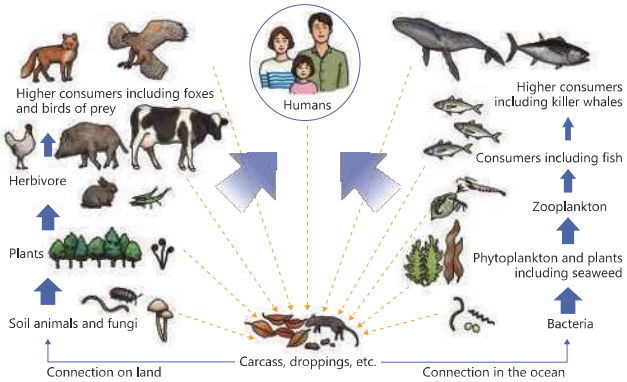
TIME TO ACT: Hydrogen Forum 2022

Realization of an Environmentally Symbiotic, Prosperous Society that Continues to Benefit from Biodiversity

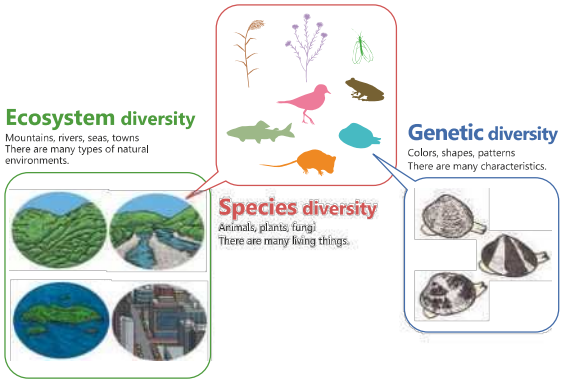
What is Biodiversity?

A wide variety of living things exist on Earth, including humans, bears, hawks, snakes, frogs, tuna, dragonflies, rice, Escherichia coli, and various bacteria. The term "biodiversity" refers to a situation where a variety of creatures with unique characteristics are able to coexist in harmony directly and indirectly, taking advantage of each other's characteristics in a variety of different environments.

Biodiversity is said to cover three levels of diversity: Many types of living things, a variety of environments, and different genes even within the same type of a living thing.



Connection of living things



Three levels of biodiversity

Benefits of biodiversity (ecosystem services)

Biodiversity is something irreplaceable created over long periods through a variety of lifeforms, including human beings. Benefits of biodiversity, called ecosystem services, are essential to our lives. In order to make the sustainable use of the benefits of biodiversity, we need to promote the conservation and restoration of biodiversity.

Provisioning services

Supply the resources needed for our daily lives, such as food, wood, water, and medicine.

Regulating services

Bring about a healthy and safe environment for us to live in by adjusting the climate, reducing heavy rain damage, and purifying water.

Cultural services

Provide artistic and cultural inspiration, educational effects, and physical and mental peace through contact with nature and fauna.

Supporting services

Support the three ecosystem services above, providing the basis for the survival of all life including humans, such as oxygen generation by photosynthesis, soil formation, and nutrient cycling.

Four ecosystem services

Characteristics of Biodiversity in Tokyo

Tokyo spreads out from the mainland to the Ogasawara Islands, or approximately 1,700 km from north to south, and has a variation in elevation of more than 2,000 m, with climate zones ranging from subarctic through subtropical and tropical.

Tokyo consists not only of urban central areas with parks and other green spaces and residential areas partly covered with homestead woodland and fields, but also of different natural environments: satoyama (community-based forest area) and wooded areas full of biodiversity, steep mountain areas overrun by natural forests, and islands with a unique natural environment and ecosystem.

In Tokyo, diverse ecosystems have been formed, and a variety of creatures live and grow thanks to the city's diversity in geography and climate as well as the efforts of people in agriculture and forestry.

Ogasawara Islands

Satoyama in the Tama area (Yokosawairi satoyama conservation area)

Valley in Okutama area

City Hall and the surrounding area

Boninosuccinea ogasawarae (endangered class I on the islands)

Rana porosa porosa (endangered class IB on the mainland)

Aster tripolium (endangered class IB on the mainland)

Revision of the Tokyo Local Biodiversity Strategy

In line with the publication of the National Biodiversity Strategy 2023-2030, which was formulated based on the global goals reviewed at the 15th Conference of the Parties to the Convention on Biological Diversity (COP15), TMG revised and publicized the Tokyo Local Biodiversity Strategy in April 2023.

In the Tokyo Local Biodiversity Strategy, we have set achieving a nature-positive framework as one of the 2030 Targets, which means putting biodiversity on track to restoration by helping all entities that aim for an environmentally symbiotic, prosperous society work together to promote the conservation and sustainable use of biodiversity. It presents basic strategies and action plans for various entities to proceed with their efforts in order to achieve this goal.

Three basic strategies in the Tokyo Local Biodiversity Strategy

Promoting the conservation and recovery of biodiversity, handing down the luxuriant nature of Tokyo to future generations

TMG will hand down the luxuriant nature of Tokyo to future generations by conserving good biodiversity that remains today and restoring biodiversity that has become somewhat deteriorated based on basic information on the nature of Tokyo.

Using the benefits of biodiversity in a sustainable manner, utilizing the functions of nature to improve the lives of Tokyo residents

TMG will use the benefits of biodiversity in and outside Tokyo, such as healing and enrichment opportunities, the revitalization of local communities, disaster preparedness and mitigation, and the adjustment of the climate, in a sustainable manner to improve the lives of Tokyo residents.

Recognizing the value of biodiversity, changing that idea into actions that address global issues as well as those in Tokyo

TMG will turn its actions into those dealing with issues across Japan and throughout the world as well as in Tokyo by recognizing the value of biodiversity and treating it as vital.

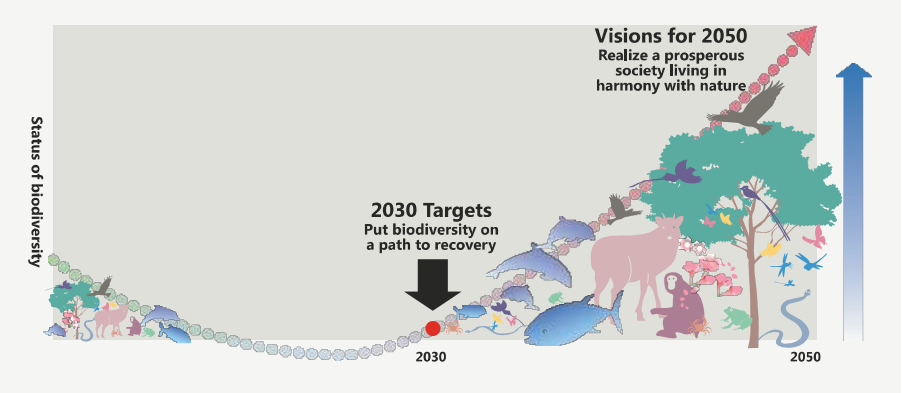


Image of achieving a nature-positive framework

"Nature-positive" means halting and reversing biodiversity loss to halt nature loss and put it on the path to recovery by 2030, measured from a baseline of 2020.

Conservation of Rare Wild Fauna and Flora, and Measures for Alien Species

In Tokyo, as many as 1,845 species on the mainland and 1,242 species on the islands have been selected in the Wildlife Species in Serious Need of Conservation in Tokyo (Tokyo Red List), of which 207 species on the mainland and 57 species on the islands have already become extinct.

To prevent the further extinction of rare creatures in Tokyo, TMG conserves rare wild fauna and flora, designates important natural land where rare fauna and flora grow and live as protected areas, and protects and breeds endangered species through ex-situ conservation.

Chloris sinica kittlitzi
(endangered class IA on the islands)

Erythronium japonicum
(endangered class II on the mainland)

Hynobius tokyoensis
(endangered class IB on the mainland)

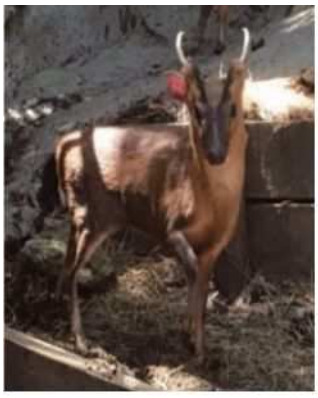
In Tokyo, some of alien species brought in from home and abroad have a major impact on native creatures. Raccoons and masked palm civets are also causing damage to living environments and ecosystems in the city.

Alien species that may pose a threat to the human body have recently been identified. In 2017, fire ants and red fire ants were found at a wharf where cargo from foreign countries arrives.

American crayfish and red-eared slider turtles, which have already been widely kept in households, are also considered problematic because of their great damage to the ecosystem.

TMG is strengthening measures against these alien species to mitigate their impact on the living environment and ecosystem.

Masked palm civet



Reeves' muntjac on Oshima island

American crayfish

Red-eared slider turtle

Conservation and Creation of Greenery in Urban Districts

The percentage of green and blue spaces (water areas) for 2018 announced by TMG is 52.5% for the entire mainland, continuing its slight decline since 2013.

In accordance with the Greenery Program, TMG has been creating greenery in parallel with urban development.

In addition to increasing the quantity of greenery with the planting of native species, we are promoting efforts to improve the quality of greenery to nurture biodiversity.

EDO-MIDORI

To encourage the conservation of biodiversity, TMG registers green spaces where native species are planted above a certain level, designating them with special logos and highlighting them on our website.

Greenery Program

Requirement	Target
Submission of Greenery Plan satisfying the greenery standards	Newly constructed, renovated, or extended buildings of 1,000 m² or larger in site area. (For public buildings, 250 m² or larger.)

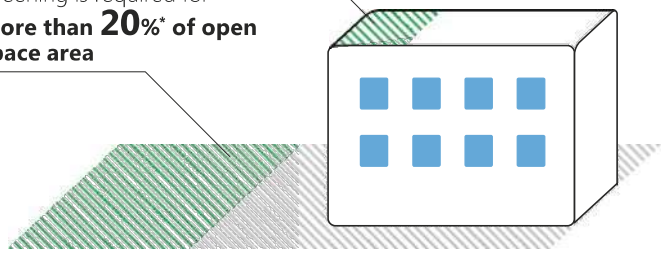
For buildings:

Greening is required for **more than 20%* of roof area**

On the ground:

Greening is required for **more than 20%* of open space area**

Examples of TMG greenery standards: Private project for site areas of less than 5,000 m²



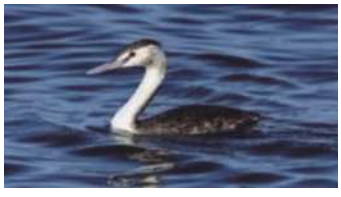
* For site areas of 5,000 m² or larger, 25% of greening is required.
* For planned development projects, 30% of greening is required (35% for areas of 5,000 m² or larger).

Kasai Kaihin Park in Edogawa Ward attracts many migratory birds every year and is home to a variety of living things, including mudskippers designated as an endangered species on the Tokyo Red List.

Due to its international importance as a habitat for waterfowl, including Aythya marila and Podiceps cristatus, the park was recognized in 2018 for the first time in Tokyo as a wetland under the Ramsar Convention, which aims to protect wetlands and ensure their ecologically sustainable use.

Kasai Kaihin Park, a wetland under the Ramsar Convention

Aythya marila



Podiceps cristatus

Rich Natural Environment in Urban Neighborhoods

Conserving precious nature together with Tokyo residents

To conserve the precious nature in urban neighborhoods, including satoyama (open light-filled woodland near populated areas) in mountain areas and hilly terrain, we are working with local municipalities to promote the designation of conservation areas, striving for preservation and restoration.

In satoyama and green spaces needing conservation, local volunteer groups play a central role in green space conservation activities, such as cutting undergrowth and thinning trees. We provide opportunities for experience-based programs to recruit new human resources to carry out such conservation activities, and work with experts to select appropriate conservation measures and verify their effects, promoting the management and use of conservation areas with consideration for biodiversity.

Natural Parks

Meiji no Mori Takao Quasi-National Park

It only takes approximately 50 minutes to get from the center of Tokyo to Meiji no Mori Takao Quasi-National Park, a famous tourist spot registered in the Michelin Green Guide. Part of the park is the property of the Head Temple Takao-san Yakuo-in that has historical and cultural features as well as magnificent landscapes. It also offers an ecosystem of abundant nature despite its proximity to central Tokyo, well deserving its world famous reputation.

TMG strives to ensure the safe and secure use of the natural park by for example using 360-degree camera images to show information on the seven mountain trails (routes) from the foot of Mt. Takao to the summit.

Route description through AR

Natural parks with various features

In addition to Meiji no Mori Takao Quasi-National Park, there are nine natural parks in Tokyo, each having its own distinctive features. Recently, the number of international visitors has increased, along with the range of activities on offer.

TMG deploys Tokyo Rangers to promote the protection and appropriate use and management of nature in areas surrounding natural parks.

In addition, TMG has set up visitor centers that exhibit information on nature around natural parks and provide guidance on how to use them, Tomin-no-Mori facilities for recreational activities to become familiar with nature, and scenic seaside and mountain villages with accommodation facilities.

Fuji-Hakone Izu National Park (Miyakejima) characterized by different volcanic landscapes on each island

Chichibu Tama Kai National Park (Mitosan) where we can enjoy mountain-walking through all four seasons

Ogasawara Islands Registered as World Heritage Site in June 2011

Consisting of over 30 islands, the Ogasawara Islands are located in the North West Pacific 1,000 km south of Tokyo, where dolphins and whales inhabit a beautiful blue ocean.

Geological features on the island show the evolutionary process of oceanic island arcs.

These islands have never been part of any continent, and so the living creatures able to reach the islands over the sea could survive only by adapting to the environment. The Ogasawara Islands were evaluated as an area with a precious ecosystem and registered as a natural World Heritage site in June 2011 as they reveal the evolution of and connection between living things not seen in any other areas.

To protect the value of the World Heritage site, we are removing influential alien species while conserving decreasing endemic species. We are also developing ecotourism to help protect and properly use valuable natural resources and are striving to prevent the entry of new alien species.

View of ecotourism

Preventing alien species from entering the islands on the soles of shoes

Promotion of Understanding of Biodiversity

A survey in FY 2022 showed that the percentage of Tokyo residents recognizing biodiversity is 73.7%.

To conserve and restore biodiversity and use its benefits in a sustainable manner, Tokyo residents and other actors have to correctly recognize the mechanism, value, and status quo of biodiversity in Tokyo, and deepen their understanding and interest in it.

TMG is working to provide more information on biodiversity and raise more awareness of it to enable each and every Tokyo resident to recognize the value of biodiversity and treat it as vital.

Natural Environment Digital Museum Concept

TMG is exploring a Natural Environment Digital Museum Concept that uses digital technology to communicate the appeal of Tokyo's natural environment.

In addition, we have already publicized DX content, such as "Tama River 360° Tour" and "Tokyo Creatures AR Illustrated Encyclopedia," to help residents learn about Tokyo's nature and encourage actions to preserve it.

Collection, accumulation, and dissemination of information on creatures

In FY 2023, the Tokyo Red Data Book (Mainland), which includes explanations of all species on the Tokyo Red List and the causes of their decline, was revised for the first time in 10 years.

In order to effectively and efficiently collect and accumulate information on wild fauna and flora that will be the basis for solving biodiversity issues in Tokyo, TMG is developing a project in which Tokyo residents participate to help collect and accumulate such information using creature survey apps, etc.

Tokyo Red Data Book 2023 (Mainland)

Promoting nature experience activities

TMG is actively raising awareness of places and events in Tokyo where people can enjoy observing living things and experiencing nature and agriculture.

Using facilities where people can learn about various natural land and biodiversity in Tokyo, TMG is encouraging natural environment education and nature experience activities.

Observing living things at Takao Forest Nature School

Rice planting in a satoyama conservation area

Realization of a Better Urban Environment

Further Improving Air Quality Etc.

A period of high economic growth in Tokyo after World War II saw rapid industrialization and a surge in automobile ownership, causing severe environmental issues and threatening the health and welfare of its residents.

TMG has promoted various pioneering environmental measures and made great strides in solving these environmental issues. We will not only strive to preserve the living conditions improved through existing measures, but also promote new initiatives to create a higher quality environment where all Tokyo residents will be able to enjoy and experience a higher quality of life with peace of mind.

Tracking Changes in the Air Quality of Tokyo

1970s

TMG regulated air pollutants such as soot and smoke from factories through ordinances and other regulations.

1990s

In parallel with an increase in traffic, air pollution escalated, which was attributable to black smoke (particulate matter) caused by automotive emissions.

2000s

TMG regulated exhaust gas from diesel vehicles from 2003 under the Tokyo Metropolitan Environmental Security Ordinance.

The air quality in Tokyo significantly improved from 2004 in terms of suspended particulate matter (SPM).

Present

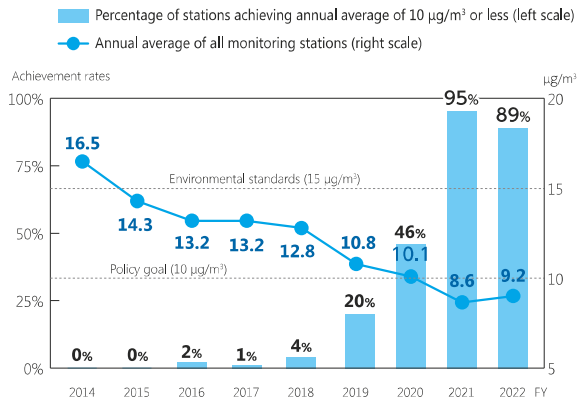
The air environment in Tokyo has improved, allowing the environmental standards for PM2.5 to be met at all monitoring stations for the first time in FY 2019. However, the concentration of photochemical oxidants still exceeds environmental standards.

Kasumigaseki

Recent Efforts

As the concentration of PM2.5 and photochemical oxidants has to be lowered, TMG is working on measures to reduce emissions of the causative agents, including volatile organic compounds (VOCs) and nitrogen oxide (NOx).

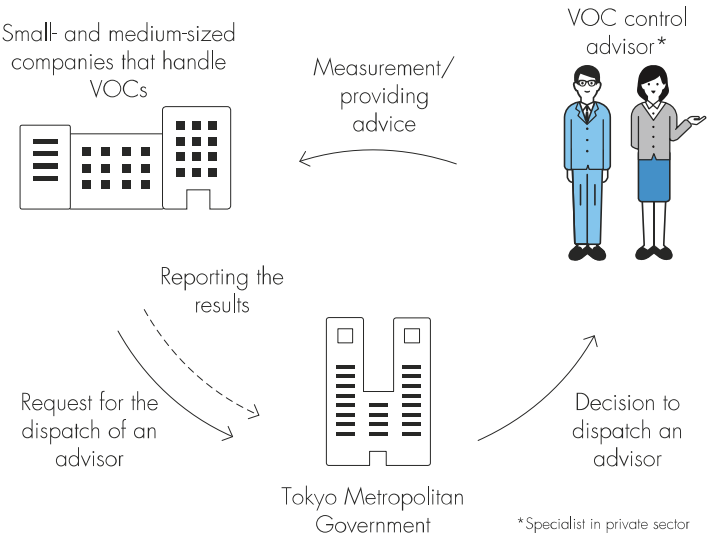
Since the environmental standards for PM2.5 were met at all monitoring stations in FY 2019, TMG will build on the existing measures for further improvements, aiming to reduce the annual average of all monitoring stations to 10 μg/m³ or less by FY 2026 and ensure that the value is kept consistently below 10 μg/m³ through to FY 2030.



Efforts for Comfortable Air Quality

VOC Control Advisor Dispatching Program

Advisors are dispatched to factories that use VOCs.



Guide for Reducing VOC Emissions

Guidebooks are distributed to VOC-emitting businesses for emissions control.

Certification labels for small combustion devices with good environmental performance

A label of a specific grade is attached to a certified device.

Air Environment Improvement Promotion Project to Realize a Clear Sky

By recruiting businesses that work on NOx or VOC emission reduction measures as Clear Sky Supporters and making their efforts public, TMG encourages emissions reductions through voluntary efforts and raises awareness of the situation and provides information to Tokyo residents.

Measures for Asbestos

There are still many buildings containing asbestos in Tokyo, and the number of buildings demolished is expected to remain at a high level until around 2050. Therefore, TMG will enhance measures taken at the stage of demolition in normal times as well as strengthening other measures to prevent dispersion from collapsed buildings in the event of a disaster.

Further guidance and technical support for businesses

TMG will ensure that the knowledge and skills of preventing asbestos dispersion during construction are firmly established in dismantlers by making sure that they are thoroughly informed of measures for asbestos based on the law, and strengthening on-site guidance and technical support for demolition crews.

On-site guidance on asbestos

Reducing Risks Caused by Chemical Substances Etc.

Measures for Chemical Substances

To prevent health hazards caused by chemical substances, TMG ensures that businesses handling chemical substances properly control them through the PRTR program and the chemical substance control program. In addition to normal times, we prevent leakage and outflows of chemical substances caused by flood at the time of large earthquakes or typhoons to curb the spread of environmental pollution.

New findings may reveal problems with substances once considered safe, including health hazards or adverse effects on the environment. By predicting the potential effects of different substances from multiple perspectives, TMG will create an environment in which the natural ecosystem will not be exposed to danger and Tokyo residents will be able to live in a safe, secure, and more sustainable manner.

Identifying risks, taking measures based on monitoring

TMG identifies the risks of chemical substances, including their impact on health, from various perspectives to set the priority of measures in collaboration with the national government, the Tokyo Metropolitan Research Institute for Environmental Protection, and other related organizations.

We monitor substances with a high risk of health effects and promptly publish the resulting data so that Tokyo residents and businesses can avoid such risks.

View of monitoring equipment

Measures for Soil Pollution

TMG will establish measures for soil pollution that consider the 3Rs of soil, and provide support for businesses and raise their awareness so that they can voluntarily compare and consider these measures to choose a rational option.

Through the open data methodology, we will ensure smooth land use, control land with non-conforming soil, identify the actual state of naturally contaminated soil, and keep traceability in place.

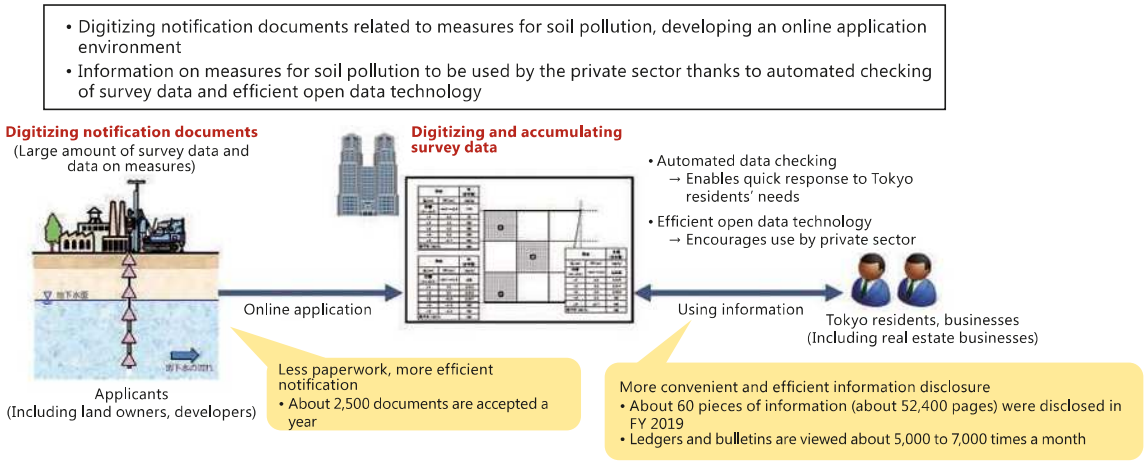


Image of open data

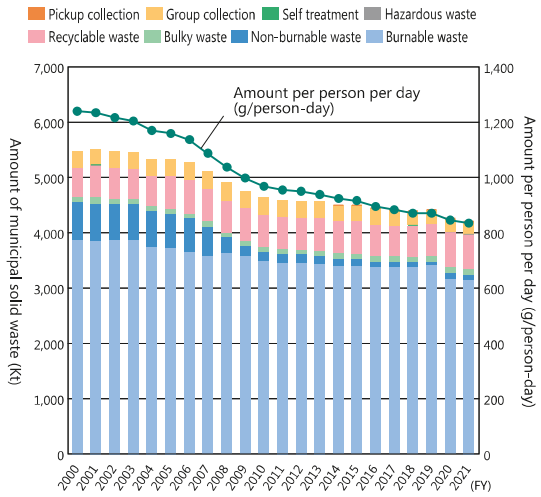
Further Promoting the Proper Treatment of Waste

Status Quo of Waste Treatment in Tokyo

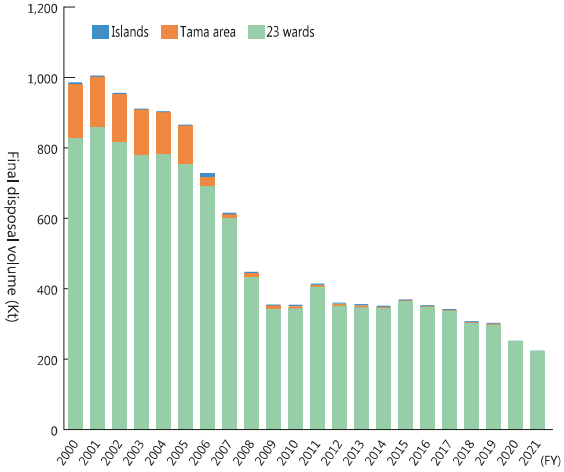
The amount of municipal solid waste generated in Tokyo per year decreased from approximately 5.50 million tonnes in the early 2000s to approximately 4.42 million tonnes in FY 2021. Partly due to progress in 3R initiatives from FY 2000 to FY 2021, the amount of waste per day per Tokyo resident decreased by approximately 30%. The final disposal volume of municipal solid waste in Tokyo steadily decreased until FY 2009 due to improvements in the recycling rate and other reasons, but has remained flat in recent years.

The amount of industrial waste generated in Tokyo has hovered around 25 million tonnes in recent years.

Changes in the amount of municipal solid waste in Tokyo



Changes in municipal solid waste final disposal volume in Tokyo



Strengthening the Waste Treatment System

Wide-area cooperation to prevent improper disposal of industrial waste

In 2000, at the request of TMG, a program called "Industrial Waste Scrum" was established in 21 local governments to eradicate illegal dumping. As of FY 2023, the organization consists of 37 local governments: Tokyo, 11 prefectures, and 25 ordinance-designated cities and core cities in the Kanto-Koshinetsu region, Fukushima, and Shizuoka prefectures.

Left: Roadside survey of industrial waste collection and transportation vehicles
Right: On-site survey at the source of waste

Strengthening Measures for Disaster Waste

Enhancing the disaster waste management plan of TMG

In June 2017, TMG formulated the TMG Disaster Waste Management Plan to organize the roles of different entities and clarify what they should work on to prepare for various disaster scenarios.

Since FY 2022, we have discussed revisions of the plan and worked to enhance its content in response to changes in estimated damage in the event of an earthquake in Tokyo, with the aim of strengthening measures for storms and flooding that have been increasing in recent years.

Month and year	Disaster name	Categories	Amount of disaster waste (K tonnes)
July 2018	Heavy rains in July 2018 (Okayama, Hiroshima, Ehime Prefectures)	**Flood**	1,900
Sept. - Oct. 2019	Faxai and Hagibis	**Flood**	1,160
July 2020	Heavy rains in July 2020	**Flood**	534
July 2021	Heavy rains in July 2021	**Flood**	13
August 2021	Heavy rains in August 2021	**Flood**	76

Amount of waste generated in recent major disasters

Main Environmental Initiatives of the Tokyo Metropolitan Government

In addition to the initiatives described above, TMG is developing a variety of environmental initiatives to realize a green and resilient global city Tokyo opening up a future.

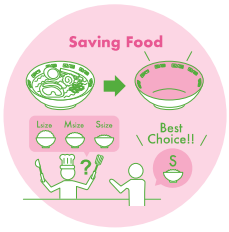
For more information, visit the websites of the Bureau of Environment.

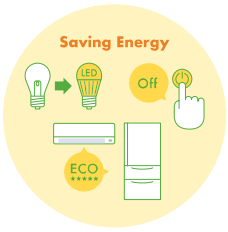
Main plans and vision

- Future Tokyo: Tokyo's Long-Term Strategy
  https://www.seisakukikaku.metro.tokyo.lg.jp/en/basic-plan/future-tokyo/
- Tokyo Environmental Master Plan
  https://www.kankyo.metro.tokyo.lg.jp/en/about_us/master_plan/index.html

Recruiting Participants in Team Mottainai!

- Reduce food waste and single-use plastics, work on energy efficiency, and develop an environmentally friendly lifestyle.





チーム もったいない

For more information:

Let's Promote the HTT Initiatives!

- The HTT (Ⓗ Herasu (Save), Ⓣ Tsukuru (Generate), and Ⓣ Tameru (Store) Electricity) initiatives will contribute to climate change measures and help ensure a stable supply of energy over the medium to long term. TMG will promote the HTT initiatives together with Tokyo residents and businesses.

HTT 電力を へらす つくる ためる TokyoTokyo

Tokyo Cool Home & Biz

Tokyo Warm Home & Biz