Sustainable City

Along with passing on a system for efficient use of energy to future generations, we will create urban spaces in harmony with the environment. We will also leave a legacy of urban infrastructure by extending the life of facilities or renewing them, and build a city where people of all generations can live with a sense of security. Various approaches will be taken to make Tokyo a sustainable city.
Make Tokyo a smart energy city

Multiple energy initiatives are underway to ensure the sustainable development of Tokyo, including more widespread introduction of energy management measures and the expanded use of hydrogen energy. These will allow Tokyo to realize high levels of energy efficiency, comfort, and disaster preparedness and to safeguard its growth over the long term.
Tokyo in the Future

Leading the World in Energy Efficiency

Initiatives taken at business establishments such as Tokyo’s cap-and-trade program\(^1\), as well as the enhanced insulation of residences and installment of home energy management systems (HEMS)\(^2\), are making steady advancements. Furthermore, thanks to the formation of systems for heat and power sharing between communities, energy utilization efficiency is rising, and overall energy consumption is falling.

- **Energy consumption**

\[\text{2030} \quad -30\%\]

(Energy use reduced by 30 percent over 2000 levels by 2030)

<table>
<thead>
<tr>
<th>Compulsory reduction of greenhouse gas emissions in the second compliance period of Tokyo’s cap-and-trade program</th>
<th>Target year</th>
<th>Target level</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY2015 to FY2019</td>
<td>17% or 15% below base year</td>
<td></td>
</tr>
<tr>
<td>Installation of cogeneration systems (CGS)(^3) for business use</td>
<td>2024</td>
<td>60 MW (double that of FY2012)</td>
</tr>
</tbody>
</table>

Expanded Use of Renewable Energy

The introduction of renewable energies utilizing methods suited to the situation in Tokyo, which does not have enough space, is progressing. These include the installation of solar power generation systems on top of parking structures and the roofs of houses and facilities.

- **Use of renewable electric energy**

\[\text{2012} \quad \text{approx 6\%} \quad \text{2024} \quad \text{approx 20\%}\]

- **Installation of photovoltaic solar power generation systems**

\[\text{2024} \quad 1,000 \text{ MW}\]

\(^1\) A system that sets limits for greenhouse gas emissions for large-scale businesses and allows transfer or acquisition of surplus through trading.

\(^2\) A system that aims to reduce energy consumption through efficient management of use of energy and appliances in homes.

\(^3\) A system that uses the heat emitted from power generation for heating and cooling.
**Aiming to Realize a Hydrogen Society**

Hydrogen is a clean energy source that does not produce CO₂ when used. We are expanding the use of fuel cell*4 vehicles and the establishment of hydrogen stations*5.

- **Fuel cell vehicles**
  - 2020: 6,000

- **Fuel cell buses**
  - 2020: 100 or more

- **Hydrogen stations**
  - 2020: 35

- **Residential fuel cells**
  - 2020: 150,000

*4 A clean system in which the reaction between hydrogen and oxygen in the air is converted directly into electricity, with only water generated when the reaction occurs.

*5 A facility that supplies hydrogen to fuel cell vehicles.
Achieve harmony with nature

In order for Tokyo to become the best city in the world, it would be indispensable for our mature city to continue to develop while protecting its beautiful natural environment. With flowers and greenery adding color to the cityscape, we will create an attractive city that is rich and restful and in harmony with nature, even in the city center.
▶ A Green City
Rich green environments exist in the city such as parks, green spaces, and greenery on private sector buildings. We are also promoting conservation activities aimed at preserving habitats for rare species of plants and animals.

▶ A Clean Waterfront Environment
The number of clean waterfront areas has increased through our further efforts to improve water quality, including measures to enhance the sewerage system. We also have environments where people can enjoy the charms of the waterfront, including the beach in Kasai and the Shibuyagawa river.

<table>
<thead>
<tr>
<th>Target year</th>
<th>Target level</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY2023</td>
<td>Total of 170m³</td>
</tr>
</tbody>
</table>

▶ Clean Air and Comfortable Spaces
The amount of air pollutants emitted by cars, ships, and other sources has fallen, and air quality has further improved. Roads in the center of Tokyo have solar heat blocking pavements and water-retentive pavements, and there are now more cool spots to provide comfort from the summer heat.

<table>
<thead>
<tr>
<th>Target year</th>
<th>Target level</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY2024</td>
<td>Improved to 100%</td>
</tr>
</tbody>
</table>
Approach

22

Enhance the safety and reliability of urban infrastructure

Much of the infrastructure supporting Tokyo will be simultaneously due for renewal in the near future. To prepare for this, Tokyo will maintain safety through substantial maintenance and management, and undertake renewals systematically while also upgrading functions. These efforts will ensure a high-quality urban infrastructure for future generations.
Tokyo in the Future

▶ Maintenance Using Cutting-edge Technology
Further advancements are seen in safety management that utilizes cutting-edge technologies such as a method for sewer line renewal that does not affect daily life in the area and the use of high-resolution cameras when performing tunnel inspections.

▶ Systematic Renewal and Function Upgrades
Progress has been made with respect to extending the service life of bridges and reconstructing sewer lines. Urban functions for disaster resistance and energy efficiency have also been upgraded.

<table>
<thead>
<tr>
<th>Extension of bridge service life</th>
<th>Target year</th>
<th>Target level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridges undergoing measures</td>
<td>FY2024</td>
<td>Total of 160</td>
</tr>
<tr>
<td>Famous bridges over Sumida River undergoing measures</td>
<td>FY2020</td>
<td>11 completed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Renewal of sewer lines</th>
<th>Target year</th>
<th>Target level</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 early developed areas in the city center</td>
<td>FY2029</td>
<td>100% completed (16,300ha)</td>
</tr>
</tbody>
</table>
Approach 23

Redevelop the urban structure for an aging society

One option for the future urban structure of Tokyo is realignment to a more compact community structure. Major built up areas will be redeveloped to concentrate their functions around train stations.

We will also make city life safe and pleasant for residents of all generations by securing good quality housing stock and by rebuilding or renovating large-scale housing complexes.
Compact Communities
By systematically building housing, commercial facilities, and medical care, senior welfare, and child care facilities around railway stations, vitality and energy has been added to communities, creating an urban residential space comfortable for everyone.

Revitalizing Large-Scale Residential Developments
In Tama New Town and other areas where the graying of the population is progressing, we have worked with local municipalities to rebuild deteriorating public housing developments and condominiums and to make public facilities barrier free, creating communities where multiple generations can continue living with peace of mind.

<table>
<thead>
<tr>
<th>Reconstruction of metropolitan housing</th>
<th>Target year</th>
<th>Target level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FY2020</td>
<td>Partial completion (Suwa housing complex)</td>
</tr>
</tbody>
</table>

Securing Quality Housing
The concept of making things that are of high quality and using them with care over a long period of time is also prevalent in the area of housing. Through the effective use of vacant housing and the regeneration of deteriorated condominiums, we have a good living environment that makes use of existing housing.
Key Terms to Understand Strategy 7

► ZEB (Zero-Energy Building)
Buildings with zero net energy consumption achieved through energy efficiency and the use of renewable energy are called zero-energy buildings (ZEB). Efforts led by developed countries to realize the zero net energy consumption concept are moving forward.

► Utilization of hydrogen energy
Hydrogen can be derived not only from fossil fuels, but from a variety of materials and methods, including the electrolysis of water. Unlike electrical energy, it is possible to store large quantities of hydrogen and transport it over long distances. In particular, hydrogen derived from biomass or wind and solar generated electricity is the ultimate clean energy, as no CO₂ is emitted during the production process as well.

► Passing greenery down to the next generation
With the decline of the population and other changes occurring within society, a discussion on Tokyo’s greenery policy in the future is unfolding. Tokyo will outline the direction to be taken with respect to the creation of greenery over a wide area, conservation goals, and other aspects in the grand design for greenery.

► Measures against the summer heat
The application of pavement materials that mitigate the daytime rise in road surface temperature is steadily underway. By installing dry mist cooling systems and promoting the development of greenery, we will increase the number of cool spots capable of alleviating heat.
Preventive maintenance

Preventive maintenance programs that extend the service life of infrastructure through systematic repair and reinforcement will be advanced. In addition to bridges and sewer lines, programs will also be implemented for the port and river embankments, and road tunnels.

Residential safety net

Programs to ensure suitable housing for those who need support in securing housing are being strengthened. As part of these programs, Tokyo will move forward with the reconstruction of up to 4,000 metropolitan housing units annually.

Large-scale renewal of expressways

With respect to metropolitan expressways, a legacy from the 1964 Tokyo Games, work will be undertaken to implement large-scale renewal and repairs, advancing the rebirth of the urban infrastructure that serves as the backbone of Tokyo.