

# Environment

Pursue cutting-edge environmental initiatives to realize a sustainable society through our business activities



## Basic Concept and Approach

The Mitsubishi Estate Group has established an environmental management system and strives to protect the environment by promoting environmental initiatives and reducing environmental impact, while also complying with environmental laws and regulations. The Group also proposes cutting-edge environmental initiatives to ensure that its business activities play a leading role in the development of sustainable communities.  
(Note) See each theme for details.

## Objectives

- We will efficiently utilize energy, water and raw materials and reduce greenhouses gases in our business activities.
- We will strive to create a smart community with efficient transportation and distribution systems as well as electricity and water use.
- We will expand the use of renewable energy in buildings and residences.
- We will proactively provide buildings and residences certified as being environmentally and socially responsible.

## Management System

The Mitsubishi Estate Group has designated the director in charge of the CSR & Environmental Sustainability Department, Mitsubishi Estate as the person responsible for promoting the Group's environmental management, and it also designates environmental sustainability managers in each of Mitsubishi Estate's business groups, corporate staff and Group companies. Moreover, to draw up plans, hold discussions and share information on the promotion of environmental management, the CSR Committee and CSR & Environmental Sustainability Subcommittee and the Environmental Promotion Liaison Committee each meet twice a year to build a structure for the efficient and systematic carrying out of environmental management and control.

## Long-Term Environmental Vision/Basic Environmental Policy

The company conducts its environmental activities guided by the Basic Environmental Policy established in 2004 and the ideal vision of the company stated in the Long-term Environmental Vision for 2050.

### Mitsubishi Estate Group Basic Environmental Policy

The Mitsubishi Estate Group has established the Mitsubishi Estate Group Basic Environmental Policy, which is based on its corporate mission. The entire Group works together to implement sound environmental management.

### Mitsubishi Estate Group Basic Environmental Policy

The Mitsubishi Estate Group has developed an environmental management system and strives to protect the environment by promoting environmental initiatives and reducing environmental impact, as well as complying with all environmental laws and regulations. Mitsubishi Estate is determined to ensure that its business activities play a leading role in the development of sustainable communities.

#### 1. Building a low-carbon society

We are proactive about the efficient use of resources and energy, and encourage the use of renewable energy to contribute to the creation of a low-carbon society.

#### 2. Creating a sound material-cycle society

We strive to reduce, reuse, and recycle in every stage of our business, including planning, development, design, construction, management and dismantlement, in order to contribute to building a sound material-cycle society.

#### 3. Fostering harmony between nature and human society

We endeavor to foster new cultural values and to practice environmental responsibility by demonstrating concern for biodiversity and developing attractive urban spaces that harmonize with the surrounding natural environment, thus helping to build a society that lives in harmony with nature.

#### 4. Promoting environmental communication

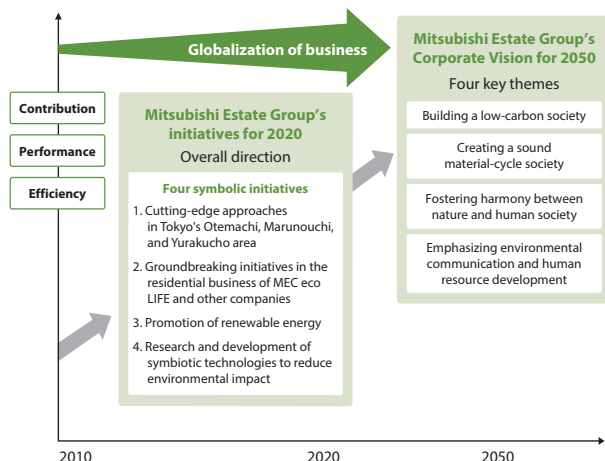
We proactively provide information on the environment and communicate with society on a broad range of issues in our efforts to coordinate and cooperate with a wide range of stakeholders.

#### 5. Increasing employees' ecological awareness

In our efforts to increase employees' awareness of environmental conservation issues and ensure highly effective environmental activities, we provide environmental education and awareness programs, aiming to develop an ecologically aware workforce.

Established on May 1, 2004  
Revised on January 1, 2006 and April 1, 2010

### Mitsubishi Estate Group Long-Term Environmental Vision



## Environmental Topics

### Otemon Tower-JX Building Equipped with Water Purification Facility for Imperial Palace Moat

In recent years, the quality of the water in the Imperial Palace moat has deteriorated significantly as a result of a lack of fresh water. The Otemon Tower-JX Building, which was completed in November 2015, is the first private-sector project to introduce a rapid water purification facility capable of purifying up to 500,000 m<sup>3</sup> of water a year to improve the water quality in the Imperial Palace moat.

Additionally, to prevent water from stagnating as a result of low water levels in the moat, the facility is also equipped with a massive water reservoir with reserves equivalent to about six 25 m swimming pools to release water into the moat. Since the completion of the project, the rapid water purification facility has been slowly but surely helping improve the quality of the water in the moat.



Otemon Tower-JX Building

### Manufacturing Environmentally-friendly, Highly Durable Wall Panels with High Yield Strength

KPI 12

Mitsubishi Estate Housing Components manufactures highly durable, high yield strength wall panels with approximately 14 times the strength of conventional panels for use in four-story wooden structures built with the 2x4 method. The panels use Shinshu larch for 24 mm thickness structural plywood, which is not normally used for houses. They also use domestic Japanese hinoki cypress and Japanese cedar for laminated wood and laminated wall supports. Additionally, 54% of the building's frame is made from Japan-grown timber, helping revitalize the domestic forestry industry. Furthermore, the insides of the wall panels are able to secure the equivalent of 68 tons of CO<sub>2</sub>, making them environmentally-friendly wooden structures.



Construction using highly durable, high yield strength wall panels

## Climate Change Strategies

### Reducing CO<sub>2</sub> Emissions and Energy Use through Building Management

Severe downpours and abnormally high temperatures mainly caused by climate change have led to increasingly severe personal and material damage every year, which is having a serious effect on everyday life.

In order for the Mitsubishi Estate Group to achieve its Basic Mission (p. 2) the Group realizes the need to prioritize environmental issues above its other CSR themes and thus it is undertaking concrete environmental initiatives.

To save more energy, the Group is not only showing consideration in equipment choices by adopting high-efficiency devices in its core business of office building

management but it also recognizes that ambient temperatures and the operating conditions of a building also have an effect so it is working together with tenants in efforts to reduce greenhouse gasses.

The CO<sub>2</sub> emissions and energy consumption of Mitsubishi Estate's 24 ISO14001-certified buildings in fiscal 2017 are shown in the graphs on p. 30.

Energy consumption per unit of floor space has been on the decline since the 2011 Great East Japan Earthquake as a result of repairs to facilities to raise energy conservation performance (such as replacing lights with LED lighting) and other energy-saving activities.

We will continue to strive to streamline energy use in buildings overall in fiscal 2018.

#### Fiscal 2017 KPI results

•Waste generated/water used

**44,967 t/  
About 5,648,000 m<sup>3</sup> a year**

KPI 2

•Solar power output

**About 8,497 kW/17 sites**

KPI 5

•Rate of annual adoption for primary energy consumption level 4

**100%**

KPI 8

•Number of buildings using district heating and cooling, and their total floor space

**115 buildings/About 7,429,000 m<sup>2</sup>**

KPI 4

•Rate of annual adoption for heat insulation functions level 4

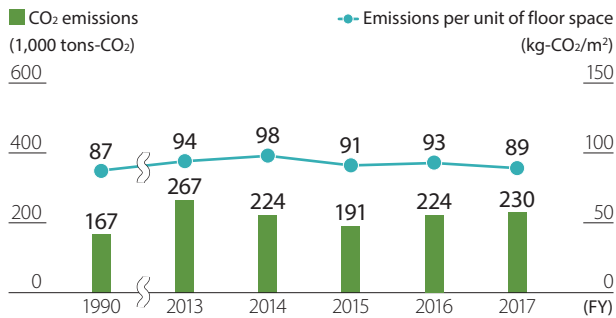
**100%**

KPI 7

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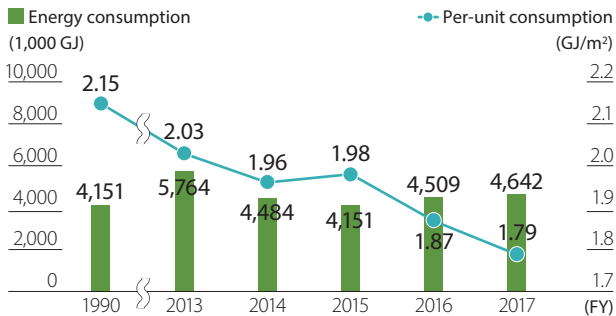
<http://www.mec.co.jp/e/csr/environment/index.html>

**CO2 emissions and CO2 emissions per unit of floor space from Mitsubishi Estate's ISO14001-certified buildings**



(Note) CO2 emissions are calculated using the emissions coefficients determined for individual electrical power suppliers. The data for 1990 includes buildings prior to renovations (such as the former Marunouchi Building).

**Energy consumption and energy consumption per unit of floor space in Mitsubishi Estate's ISO14001-certified buildings**



(Note) The number of ISO-certified buildings changes each fiscal year due to renovations and sales/purchases.

**Energy use and CO2 emissions reported under Japan's Energy Conservation Law (fiscal 2017)**

	Overall	Office buildings	Commercial facilities	Hotels	Other
Energy use (1,000 kl/year)	272	205	44	14	8
Unit consumption (kl/m2 per year)	0.034	0.037	0.045	0.065	0.008
CO2 emissions (1,000 t-CO2/year)	529	399	86	22	22
Unit emissions (t/m2 per year)	0.067	0.071	0.087	0.104	0.019
Number of target facilities (buildings)	114	66	20	8	20
Floor area (1,000 m2)	7,928	5,617	982	215	1,114

(Note) Compiled for Mitsubishi Estate Group main buildings for which information on energy-saving measures is reported in compliance with the Energy Conservation Law (excluding buildings with a floor area less than 1,000 m2). This table is prepared on the basis of the information submitted by Group companies in compliance with the Energy Conservation Law, with some additions, and may differ from the actual figures submitted.

**Volume of waste generation reported under Japan's Energy Conservation Law (fiscal 2017)**

	Overall	Office buildings	Commercial facilities	Hotels	Other
Waste generated (1,000 t per year)	45	24	15	2	4
Per unit (t/m2 per year)	0.008	0.006	0.017	0.008	0.008
Number of target facilities (buildings)	65	33	18	8	6
Floor area (1,000 m2)	5,302	3,725	901	215	461

(Note) Compiled for Mitsubishi Estate Group main buildings (excluding buildings with a floor area less than 1,000 m2).

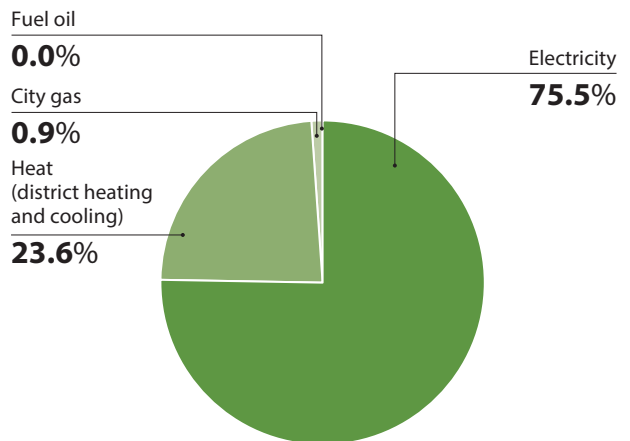
**Collaborating with Tenants to Conserve Energy**



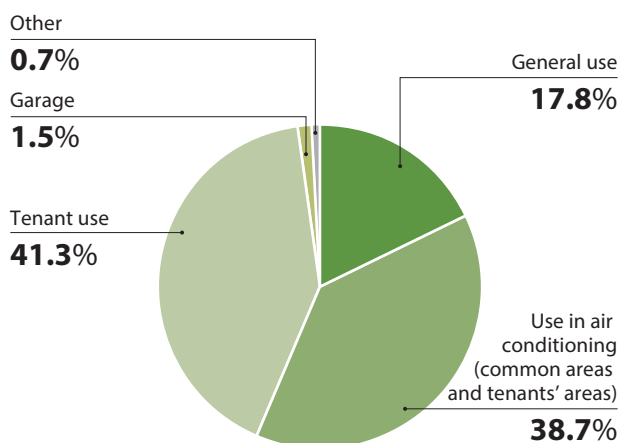
Approximately 80% of the energy used in buildings managed by Mitsubishi Estate is used for electricity, the majority of which is used by tenants. To counter this, in 2008 the company began organizing regular Global Warming Prevention Councils with the tenants as members in each ISO14001-certified building in the Tokyo area so that the company could engage in energy-saving activities together with the tenants.

Every year, Councils are convened for an explanation of CO2 emission reduction and energy-saving initiatives based on the Tokyo Metropolitan Environmental Security Ordinance and the Energy Saving Act and an update on their progress. Mitsubishi Estate will continue these initiatives, providing explanations of concrete reduction targets and energy-saving activities under way in the buildings and introducing tenants to energy-saving methods.

**Fiscal 2017 energy consumption by use (for 24 ISO14001-certified buildings)**



**Fiscal 2017 energy consumption by application (for 24 ISO14001-certified buildings)**



## Obtaining Low-Carbon Building Certification

From fiscal 2017, Mitsubishi Jisho Residence began to offer certified "low-carbon buildings"\* under its "The Parkhouse" brand of condominiums. The Parkhouse Futakotamagawa Midori no Mori in Setagaya-ku, Tokyo, and The Parkhouse OIKOS Mikunigaoka in Sakai, Osaka received certification, and the initiative is expanding. All Futakotamagawa Midori no Mori buildings are fitted with a central airconditioning system known as Condominium Aerotech which maintains a comfortable temperature throughout the

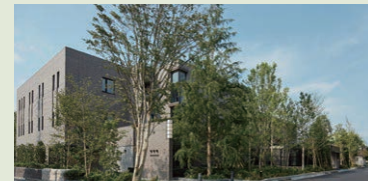
building while OIKOS Mikunigaoka has installed ENE-FARM type S residential fuel cells. The adoption of these and multiple other cutting-edge environmental technologies are part of the company's efforts to make a low-carbon society a reality.

\* A system of certifications based on Japan's Law on the Promotion of Low-Carbon Cities given by government authorities to buildings in their jurisdiction which take extensive measures to reduce their carbon footprint.

The Parkhouse OIKOS Mikunigaoka/CG image of expected exterior when complete



The Parkhouse Futakotamagawa Midori no Mori/Photo of exterior



## Preserving Biodiversity

### Four Properties Win ABINC Award in 2017



The real estate business considers ways in which it can help preserve biodiversity through the appropriate management of its land and the formation of green networks\*. The Mitsubishi Estate Group actively works to protect biodiversity by creating a Biodiversity Manual among other initiatives.

The Parkhouse Wako and three other properties owned by Mitsubishi Jisho Residence were awarded Association for Business Innovation with Nature and Community's ABINC certification (condominium category) for 2017 for their creation of green spaces that harmonize with the ecosystems in their neighborhoods. This is their fourth consecutive year of getting the award since the system began. This makes Mitsubishi Jisho Residence the business with the largest number of certified properties at a total of 17.



\* Please visit the BIO NET INITIATIVE website for more information (in Japanese).  
<https://www.mecsumai.com/bionetinitiative/>

### Improving the Waterfront Environment and Preserving the Ecosystem of the Imperial Palace Moat



The Mitsubishi Estate Group undertakes a lot of projects meant to protect biodiversity and improve the environment in the Marunouchi area. One example is the building of Hotoria Square, an environmentally symbiotic green space encompassing about 3,000 m<sup>2</sup> in front of the Imperial Palace moat.

In May 2018, we started a Moat Project intended to improve the waterfront environment and revive the ecosystem in the moat. This began with collecting and observing the few water plants and animals living the water. The collected plants and animals were moved to Hotoria Square and a rooftop container biotope owned by Mitsubishi Estate where they will be monitored with the aim of preserving rare species and restoring the water environment.



Hotoria Square

### Fiscal 2017 KPI results

•Energy use/CO<sub>2</sub> emissions



**About 272,000 kl/  
About 529,000 t a year**

•Area of green on roofs and walls



**About 33,800 m<sup>2</sup>**

•Rate of annual adoption for soleco system



**58.8%**

•Number of projects recognized with CASBEE (new construction design)/Development Bank of Japan (DBJ) Green Building/ABINC certifications



**9/20/22 buildings and projects**

•Rate of annual adoption for high-efficiency appliances (hot water heaters/LED equipment/ultra-water-conserving toilets)



**100/100/100% a year**

**Please visit the website for details.**

<http://www.mec.co.jp/e/csr/environment/index.html>



## Using Water Resources Efficiently

### Using Water Resources Efficiently in Buildings

The effects of climate change brought about by global warming have led to a greater risk of water shortages worldwide. In Japan, there are doubts about the continued stable supply of water from dams due to changing rainfall patterns in recent years. To mitigate the effect of water shortages on socio-economic activities and ensure the stable use of water, it is important to systematically promote the efficient use of water resources and enact strategies based on supply and demand considerations.

In recognition of this pressing issue, the Mitsubishi Estate Group is working on improvement measures such as adjusting the amount of water used by toilets and bathrooms in order to streamline water use in buildings. It is also reducing the use of water resources in buildings that

use recycled water\* by, for example, purifying cooling tower blow water and kitchen wastewater and reusing it as toilet water.

\* Recycled water: Processed water derived from rainwater, tenant kitchen wastewater and other sources. Recycled water is also used for watering outdoor plants and as toilet water in the Marunouchi Building.

#### Volume of water usage reported under Japan's Energy Conservation Law (fiscal 2017)

	Overall	Office buildings	Commercial facilities	Hotels	Other
Water Usage (1,000 m <sup>3</sup> per year)	5,648	3,151	1,329	1,046	122
Unit consumption (t/m <sup>2</sup> per year)	0.954	0.725	1.475	4.859	0.265
Number of target facilities (buildings)	72	40	18	8	6
Floor area (1,000 m <sup>2</sup> )	5,923	4,346	901	215	461

(Note) Compiled for Mitsubishi Estate Group main buildings (excluding buildings with a floor area less than 1,000 m<sup>2</sup>)

### Efficient Water Resource Usage Initiatives in Fiscal 2017 KPI 2

#### The Public and Private Sector Team Up to Mitigate the Heat Island Phenomenon - Sprinkling Recycled Water from the Marunouchi Building on Gyoko Street -

Mitsubishi Estate has been working with the Tokyo Metropolitan Government Bureau of Construction since 2010 to sprinkle recycled water from the Marunouchi Building on Gyoko Street, which extends from the Tokyo Station Marunouchi Exit to Hibiya Street. Sprinkling water suppresses the road surface temperature and helps mitigate the heat island phenomenon. The initiative continued through fiscal 2017 as well. When the sprinkled recycled water evaporates due to a rise in atmospheric temperature, it absorbs heat from the surrounding area, reducing the road surface temperature by up to 10°C (based on measurements from summer 2010).

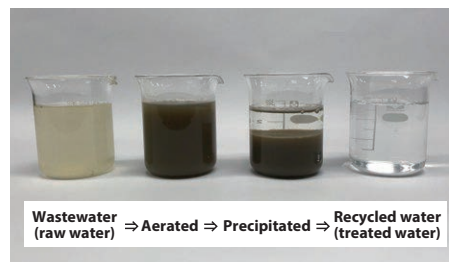
To make this project possible, the Tokyo Metropolitan Government Bureau of Construction constructed a "water-retaining road surface" containing water-absorbing materials capable of saving up water within the road surface in Gyoko Street. Mitsubishi Estate installed the equipment needed to sprinkle the recycled water from Marunouchi Building onto the street.

#### Using Recycled Water Continuously

In fiscal 2017, Sunshine City was able to recover 343,608 m<sup>3</sup> of its precious water resources out of the 582,781 m<sup>3</sup> of tap water that was used in the building that year. The recycled water was used to flush toilets.

The treatment system for this wastewater is called the "recycled wastewater system" and is in the middle of the water and sewage works. It was installed 40 years ago when Sunshine City was first built. It was the first recycled wastewater system installed in Japan for a single building. The treatment plant is located in the 3rd floor basement of the Sunshine 60 building. In a single day it purifies up to 1,200 tons of wastewater from toilet sinks, kitchen wastewater from the building and drain water from the Hotel bathrooms. The treated recycled water is used to flush toilets inside the building.

(Note) Excludes water for flushing bidet toilets.



How recycled water (reclaimed water) is made

#### Fiscal 2017 KPI results

• Small- and medium-sized building renovations/condominium renovations

**15 buildings/634 units**



• Rate of annual use of Japan-grown timber

**50% a year**



**Please visit the website for details.**

<http://www.mec.co.jp/e/csr/environment/index.html>

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## Initiatives Overseas

### Promoting the Acquisition of Environmental Certification through “Projects Earning Certification”

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#### United States

##### 1221 Avenue of the Americas, New York

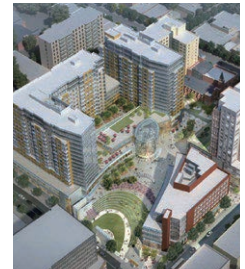
Silver

This building was completed in 1972 in Manhattan. Although it was LEED certified in 2009, it was awarded a Silver LEED rating in 2014 for improvements made to use water more efficiently.



##### Flushing Commons, New York

This is a large-scale development consisting of residences, offices, commercial facilities, a public square, parking lots and a YMCA. This development has two phases, the first of which was completed in June 2017. The project aims to earn a Silver LEED rating for building and land use measures taken in consideration of energy conservation and the environment.

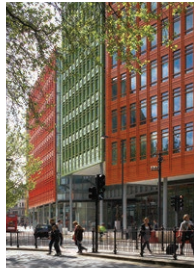


#### Europe

##### Central St. Giles, London

Excellent

A joint redevelopment project with Legal & General, a major UK life insurance company, this complex covers a total floor area of 66,000 m<sup>2</sup> and comprises offices, retail shops and residences. Construction was completed in April 2010. The project earned a BREEAM “Excellent” rating, which was the highest possible at the time of application.



##### 8 Finsbury Circus, London

Excellent

This project is a redevelopment of an office building located in the City of London, completed in April 2016. It achieved a BREEAM “Excellent” rating, the highest possible at the time of application.



#### Asia

##### Sky Vue, Singapore

Gold plus

Sky Vue is a built-for-sale condominium complex jointly developed by Mitsubishi Estate Asia and CapitalLand Group. The complex earned Green Mark Gold Plus certification.



##### Sky Habitat, Singapore

Gold plus

Sky Habitat is a built-for-sale condominium complex jointly developed by Mitsubishi Estate Asia, CapitalLand Group and Shimizu Corporation. It also earned Green Mark Gold Plus certification.

