

Environmental Considerate Policy and Approach for UR Projects

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Urban Renaissance Agency in Japan, called UR, has achieved an environmentally considerate urban and housing development for half a century in the fields of contact with familiar nature, effective utilization of resources and energy, and comfortable life with safe and secure. In 2006, UR pronounced “Environmental Consideration Policy” that is summarized as the philosophy that underlined all of its past environmental initiatives, and published its first Environmental Report that introduced UR’s initiatives for environmental considerations. In addition, the UR’s version of the action plan for countering global warming (UR-eco Plan 2008) was adopted in March this year.

In our paper, we will introduce UR’s initiatives for environmental considerations with developed cases from 4 points of view, (1)To preserve and regenerate natural environment, (2) To promote saving energy, (3)Effective use of resources and reduction of waste, (4) an environmentally considerate lifestyle

Explaining the above concretely, the contents are Rooftop gardens, Biotope, Recycling of construction byproducts, Solar-power facilities, Wind path in buildings, Kleingarten, and more.

At Urban Housing Technology Research Institute and other facilities of UR, UR undertakes R&D, and the findings have been reflected to UR’s rental properties for proliferation. At present, environmental consideration is positioned as one of the most important R&D themes of the day.

Keywords: Environmental Consideration Policy, Environmental Considerate Initiatives, Urban Renewal Projects

INTRODUCTION

The efforts are to urgently implement countermeasures in various parts of the world. UR has also enhanced climate measures as part of its environmental initiatives. Following on with the first environmental report compiled and released in 2006, UR developed its version of the “action plan for countering global warming (UR Eco Plan 2008)” in FY2007. This document introduces such initiatives.

HISTORY of UR’s environmental Initiatives

Since the establishment of the predecessor Housing & Urban Development Corporation in 1955, UR has developed housing design standards and led others in taking on the task of creating a good basic living environment through ensuring sunlight, ventilation, etc. It has developed and accumulated technologies and know-how in areas of ensuring sound-proof housing, preventing condensation, achieving energy saving, creating greenery, conserving the water environment, promoting the recycling of construction waste and addressing the Heat Island Phenomenon, in an effort to build up good environmental stock as the “top runner” of urban and residential development in response to the changing demands of the times. Currently, it manages approx. 770,000 UR rental housing properties.

With a growing need to counter global warming, the government enacted the Law Concerning the Promotion of Business Activities with Environmental Consideration by Specified Corporations, etc., by Facilitating Access to Environmental Information, and Other Measures (Environmental Consideration Promotion Law) in June 2004. This Law defined UR as a “Specified Corporation” and mandated the reparation and publication of an Environmental Report. In response, UR set up the Environmental Consideration Promotion Committee, headed by UR’s Vice President and consisting of all UR directors, as a cross-sectional mechanism for promoting environmental considerations and prepared / published its first Environmental Report in 2006. In March this year, the UR’s version of the action plan for countering global warming (UR-eco Plan 2008) was adopted to make full-scale implementation of climate measures.

Environmental consideration Policy and environmental Report

Ahead of compiling an environmental report, UR summarized the philosophy that underlined all of its past environmental initiatives, and declared it as the “Environmental Consideration Policy”. The Policy describes how it endeavors to achieve environmentally friendly urban / housing development, reduce environmental strains in the process of urban / housing development, and work with the users of the environment it provides in achieving these targets.

UR’s first environmental report “Cities, Living and the Environment” for FY2007, published in July 2006, introduced UR’s initiatives for environmental considerations over the past 50 years since establishment, identified / released the amounts of injected resources / energies and emitted CO₂ .

- *Environmental Consideration Policy* —
1. *We will achieve environmentally friendly urban and housing development by:*
 - *Striving to preserve and regenerate natural environment in urban areas*
 - *Promoting energy conservation in urban and housing development*
 - *Endeavoring toward effective use of resources and reduction of waste*
 - *Ensuring safety, security and comfort in urban and housing development*
 - *Working with you to explore an environmentally considerate lifestyle*
 2. *We will take an environmentally considerate approach in projects through:*
 - *Working toward project implementation with reduced environmental strains*
 - *Deepening communication with you about the environment*

UR’s framework for countering global warming (Overview of action plan)

UR operates a total of 770,000 rental properties nationwide, mainly in large cities, housing approx. 1.7 million people. This accounts for 1.4% of a total number of residential homes / units in Japan, and 1.3% of the total Japanese population. Although it is tenants who actually use the properties, their facilities and home appliances generate the CO₂, UR contributes to the figure in that the amount of emission is affected by the performance of the housing and its fixtures such as hot water systems. In the fields of urban regeneration and New Town development, the facilities and housing sites developed by UR are handed over to private-sector businesses. Once the ownership is transferred, it is difficult to correctly estimate the amount of CO₂ emission. Yet, just like in the case of UR rental properties, the emission volume is affected by conditions demanded by private-sector businesses in relation to the foundation, architecture, facility performance and ownership transfer of the properties prepared by UR. It is therefore possible to take an initiative in reducing CO₂ in these fields. UR plans to initiate active efforts to counter global warming not only in the business areas it is directly involved in the generation of CO₂, but also in the fields such as the tenants’ exclusive-use areas at UR rental properties, or projects for urban regeneration / New Town development, in which UR is indirectly associated with CO₂ emissions.

In view of the above considerations, UR has classified the following areas subject to the action

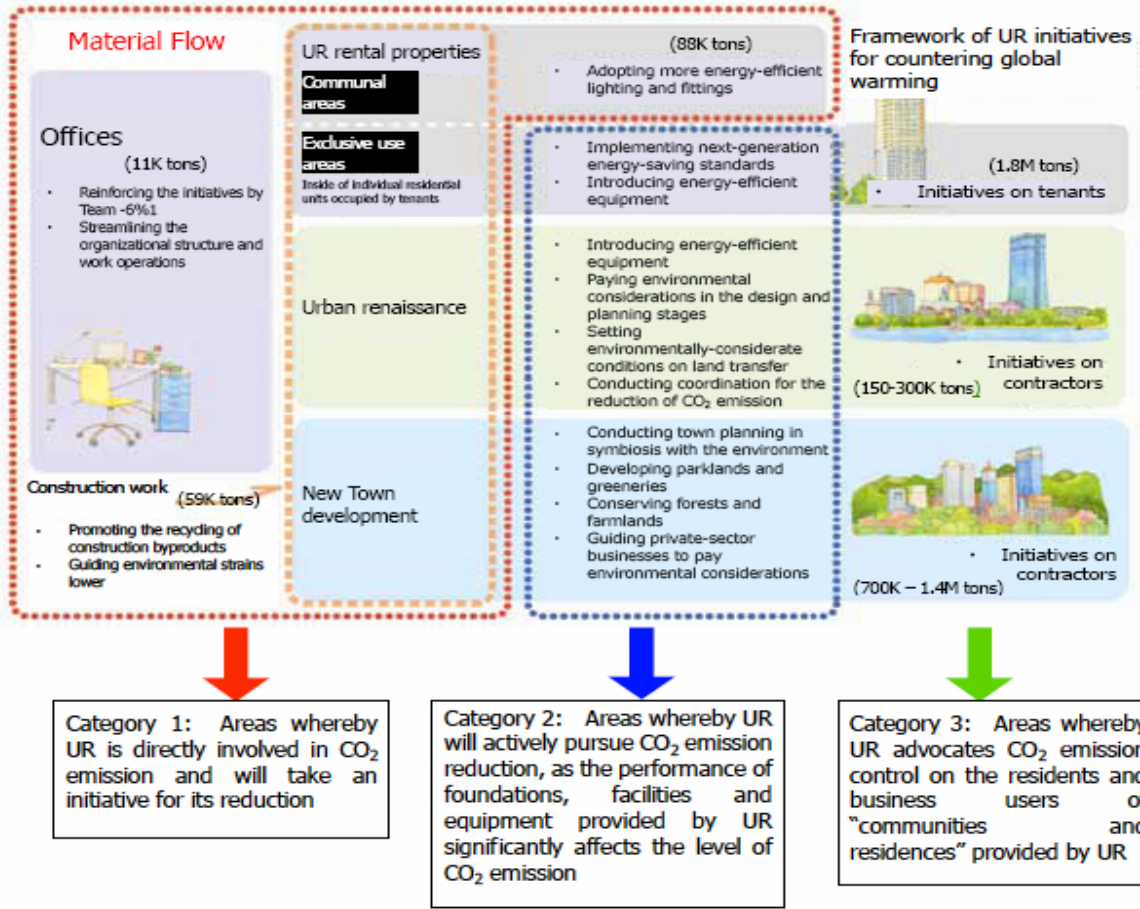
plan according to the degree of its involvement in CO₂ emission, and defined it as the framework of CO₂ emission reduction.

Category 1: Areas whereby UR is directly involved in CO₂ emission and will take an initiative for its reduction (Communal areas at UR rental properties, UR construction sites, UR offices)

Category 2: Areas whereby UR will actively pursue CO₂ emission reduction, as the performance of foundations, facilities and equipment provided by UR significantly affects the level of CO₂ emission

(Facilities developed by UR in UR rental properties for exclusive tenant use/ Facilities and Equipment developed by UR or under the guidance of UR in the Urban Renewal field/ Facilities and Equipment developed by UR or under the guidance of UR in the Suburban Environment field)

Category 3: Areas whereby UR advocates CO₂ emission control on the residents and business users of “communities and residences” provided by UR



(Figure 1: Framework of UR’s countermeasures for global warming)

Term of the action plan and reduction Target

The action plan for countering global warming runs for six years from FY2008 to FY2013. The target for emission reduction represents the total amount of CO₂ emission reduction achieved in FY2013 from the FY2005 level. Total reduction of the target is approximately 14,000 tons. And the breakdowns are (1) Residential Environment field: 11,200 tons/ (2) Urban Regeneration field: 1,100 tons/ (3) Suburban Environment field: 1,100 tons/ (4) Construction work:— (included in the above fields)/ (5) Offices: 1,100 tons

UR’s specific Initiatives of environmental consideration

UR has identified CO₂ emissions in the following areas: Communal parts of rental properties,

construction work commissioned by UR, and UR's office operation. Steps taken by UR would have a direct and immediate impact on these areas, and it is necessary to implement appropriate measures. The CO₂ directly released from UR projects, approx. 60% of those that can be identified is attributable to the use of electricity at communal parts of UR's rental housing for powering lighting in communal hallways, outdoor lights and feed-water pumps. These make it the area that requires countermeasures most.

Efforts are made to make the buildings and facilities of UR's rental housing as friendly to the environment as possible through improving heat insulation property, introducing energy-efficient appliances and achieving long-term durability. This has made these properties kind the household budget as a result. Since the amount of energy consumption by tenants changes significantly regardless of the quality of hardware provided, there is a heightened importance in providing environmental information and encouraging tenants to act with environmental consideration, so as to raise their environmental awareness.

In its initiatives for urban regeneration, UR is taking an environmentally-considerate approach in building its operational foundation and developing facilities to be handed off to end users. It is forging partnership with local governments and private-sector housing developers to promote environmentally-considerate urban development. In the projects for New Town development, UR is promoting environmentally-considerate urban / housing development rich in greenery, while trying to strike a harmony with respective area's natural environment. Initiatives for environmental symbiosis and global warming countermeasures are implemented in an effort to create a high-quality and attractive suburban living together with users.

Four Points Approach

We will introduce UR's initiatives for environmental considerations with developed cases from 4 points of view, (1)To preserve and regenerate natural environment, (2) To promote saving energy, (3)Effective use of resources and reduction of waste, (4) An environmentally considerate lifestyle

(1)To preserve and regenerate natural environment:

Countermeasures for Heat Island Phenomenon (Rooftop gardens, Water-retentive paving)

The implementation of Heat Island countermeasures will alleviate the heat buildup in the urban environment, thereby cutting the demand for using air conditioners and reducing the emission of greenhouse gasses.



(Figure 2: Rooftop garden of Shinagawa View Tower)

Securing greenery

Since the launch of its predecessor Housing & Urban Development Corporation in 1955, UR has planted over six million trees on the premises of its rental housing to create expanses of greeneries measuring approx. 1,300 hectares in total. The plants on these patches of green land are believed to absorb approx. 24,800 tons of CO₂ per annum, an equivalent of annual CO₂ emission from around 12,000 average households.

Green Bank System (set up a database of available trees on project sites)

When UR renews its rental housing, established trees and shrubs are preserved as much as possible, replanted within the same compound, or transferred to other areas, so as to protect precious greenery nurtured over many years. Trees that have to be felled are processed to be recycled as timber for making benches. For effective use and recycling of trees, UR has set up a database of available trees on project sites (Green Bank System), and facilitated effective use of

tree resources in partnership with local governments and private-sector businesses.

Biotope

As the natural environment continues to disappear from urban residential communities, UR is working toward restoring urban ecosystems, preserving biodiversity, creating space where humans can interact with other living matter, and providing an affluent and content life to local people. Systematically developing space for all life-forms also contributes to preserving and regenerating local ecosystems. Biotopes, developed at its rental housing compounds, have been systematically monitored since FY2005.



(Figure 3: Rooftop garden of Shinagawa View Tower)

Preserving the water circulation and reusing rainwater effectively (Rainwater infiltration facilities)

Rainwater infiltration into the ground, instead of letting it flow into the sewerage system, reduces temporary strains on rivers, contains flood risks, and replenishes groundwater, thereby preserving the natural circulation of water. Since the mid 1950s, UR has taken on the task of preserving and regenerating local water circulation through introducing highly permeable drain pipes and allowing rainwater to seep into the ground as much as possible to secure a sufficient amount of ground water and river water. At the same time, excess rainwater is amassed at reservoirs for use in parkland streams or garden water.

Creation of green environment in central Tokyo

In a project that changes the usage of under-utilized or non-utilized land (e.g. a former factory site), UR not only works toward giving energy saving features to buildings, but also creating a nature-rich and attractive environment by introducing parkland or rooftop gardens, so as to revitalize the area and reduce CO₂ emission at the same time.

Development of Disaster Management Parks

The devastation of the 1995 Great Hanshin & Awaji Earthquakes shed light on the function for controlling urban disasters. In a bid to reinforce this function in established city areas whose city structure is vulnerable to earthquakes and other disasters, UR is developing Disaster Management Parks, which would act as an evacuation site in emergency, as part of the effort to improve the surrounding city areas.

This park is equipped with functions such as anti-quake reservoir and storage for emergency supplies. At a normal time, the park may be used as the site for exercise or recreational activities, just like other regular parks, and contribute to the community's level of comfort in areas such as day lighting and ventilation.

Creation of the living environment in symbiosis with the local natural environment

In New Town development, UR has worked on systematic community development in harmony with the local natural environment, adapting to pre-development topography to minimize land preparation, incorporating existing windbreakers and sloping forests into parkland or natural pathways, preserving / regenerating the water circulation system, and establishing habitats for various life-forms. Of a total of approx. 42,200 hectares of areas developed as New Town

compounds, around 4,310 hectares (10.2%) have been turned into parkland. This is around 12.6 times the size of the Central Park, New York. These initiatives have successfully reduced strains on rivers and sewerage systems, and created communities with minimal environmental strains in symbiosis with the local natural environment.



(Figure 4: Housing complex of Tamadaira no mori)

(2) To promote saving energy;

Improvement of heat insulation performance

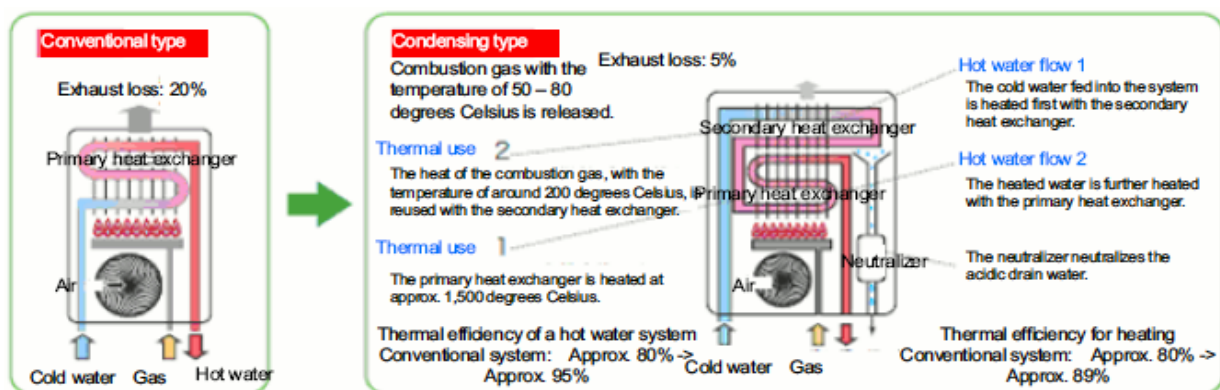
In Japan, approx. air conditioning accounts for 24% of CO₂ released from household energy use. Providing a building with good heat insulation properties is extremely important to achieve efficient air-conditioning with minimal energy. UR is providing repairs and other measures to improve their heat insulation property.

As an example, there is “Research into housing energy saving through repairing of existing RC communal housing”.

Condensing hot water system

In Japan, hot water systems account for around 21% of CO₂ released from household energy use. The introduction of high-efficiency devices is extremely important to conduct efficient distribution of hot water with minimal energy. In FY2003, UR adopted a high-efficiency hot water / heater system (condensing type) that recovers latent heat from steam in the combustion exhaust gas, and reuses it for preheating / heating water.

Hot water systems generally have the service life of 10 to 15 years. Significant emission reduction is expected if conventional hot water systems are replaced with condensing type systems when they require repair work, or when vacant housing units undergo general maintenance work. UR is introducing the condensing type hot water system when the existing systems at UR rental properties need to be replaced, as one of key measures. This is the nation’s first large-scale initiative to introduce the condensing type hot water system to existing housing compounds.



(Figure 5: Mechanism of the condensing type hot water system)

Fuel cell

Fuel cell for household use is a highly efficient energy system, retrieving hydrogen from city gas, causing it to react with oxygen in the air to generate electricity, and applies the exhaust heat,

generated at the time of the chemical reaction, to heat water for circulation. After UR commenced research with the Ministry of Land, Infrastructure and Transport in 1999, UR initiated the world’s first attempt to introduce the “household fuel cell co-generation system” to five units of the communal housing at Osaka City in FY2004.

Shift to energy efficient equipment (Replaced with more compact fluorescent lights, Use of elevators using inverter technology)

Introduction of solar-power facilities (Solar power generation on ultra high-rise housing buildings)

Introduction of District Heating & Cooling

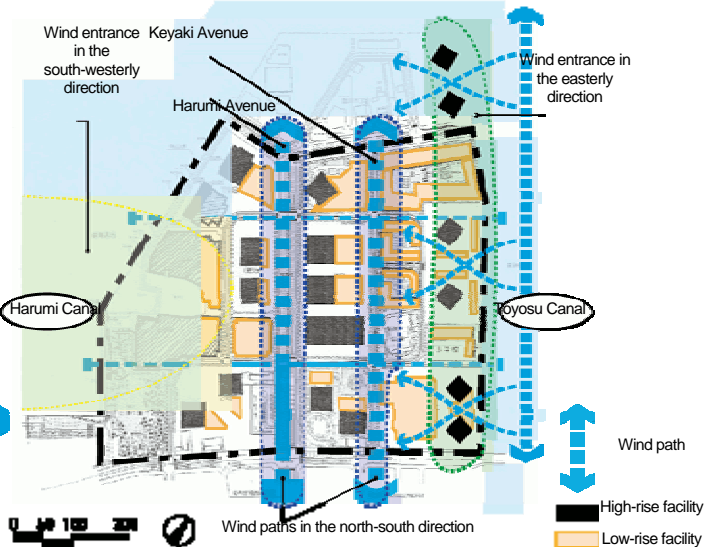
At a large-scale development in central Tokyo involving composite-purpose facilities, UR adopts the District Heating & Cooling system to equalize energy loads as a way of controlling CO₂ emission. In the case of an urban regeneration project, conditions such as building scales, purposes and layout are examined to consider and encourage the introduction of high efficiency systems such as co-generation.

Proposing an environmental symbiosis plan through urban regeneration coordination

In major urban regeneration projects, UR takes part as a coordinator of project planning or project partner, to submit proposals of environmental consideration in the planning and design stages, and collaborate with private-sector businesses and local governments in creating attractive and comfortable urban space with low environmental strains and beautiful landscapes.

Environmental characteristics of each site are examined to propose a development plan and design with focus on environmental symbiosis, including the area’s thermal environment and landscape. For example, UR compiles a guideline for building the “wind path” or Green Network for countering the Heat Island Phenomenon, to propose an environmental consideration approach suitable for each site.

As an example, there is “Wind Path in Tokyo in the Toyosu district”.



(Figure 6: Formation of wind paths in the Toyosu)

Partnership with the private sector for housing development with minimal environmental strains

Housing development with minimal environmental strains are also pursued in a major project with the infrastructure development undertaken by UR and housing / facility construction by a private-sector company. UR implements environmentally-considerate planning, designing and construction in the infrastructure development, and also actively encourages an environmentally-conscious approach for the housing construction part of the project by including it as one of the conditions in the bidding process. Such a conscious guidance on private sector businesses toward environmental considerations is regarded as one of UR’s major roles.

As an example, there is “Private-sector guidance toward CO₂ reduction in the Koshigaya Lake Town project”

(3) Effective use of resources and reduction of waste;

Recycling of construction byproducts

In construction projects, light oil for fueling large construction machinery and trucks used for site development, excavation and transportation is the primary cause of CO₂ emission. Construction byproducts, generated in the course of redevelopment, are also emerging as major environmental strain. In order to reduce construction-related CO₂ emission, UR has provided guidance to contractors, adopted energy-saving machinery and materials, and reused concrete debris generated in redevelopment, in an effort to promote recycling of construction byproducts.

Cutting-edge initiatives are implemented since 1988 to raise the recycling rate of construction byproducts, generated in the redevelopment of rental housing blocks. Concrete debris, in particular, is crushed at the demolition site as much as possible to facilitate recycling at the same site. This reduces environmental strains associated with producing new crushed concrete or transporting concrete debris.

Change of the bidding system and other construction-related measures to counter global warming

In an effort to encourage contractors of UR projects to take initiatives for environmental consideration, UR made a move in 2007 to add items regarding global warming to the list of general assessment factors applied in the bidding process.

Introduction of the co-generation system

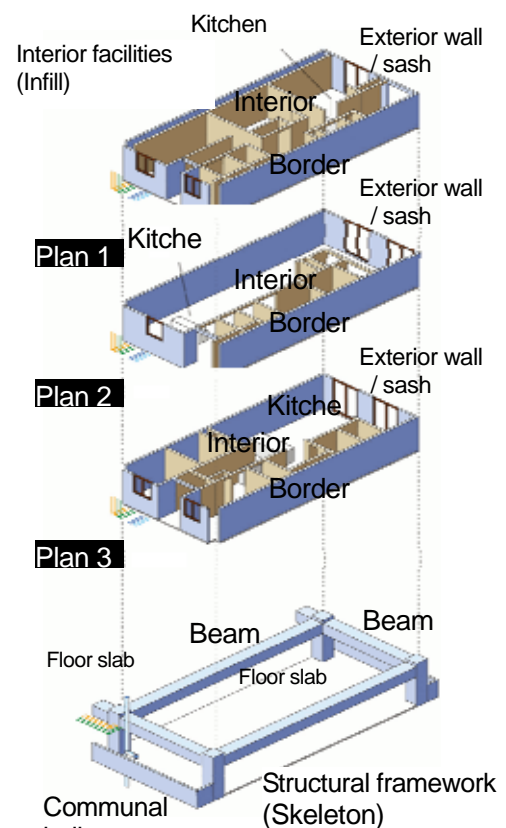
UR has partially introduced the co-generation system, which generates electricity on housing premises, and utilizes exhaust heat for supplying hot water. It started research into the co-generation system for use at housing and other sites in 1985, and has introduced it to approx. 5,000 housing units at ten complexes, including the introduction to Parale Kawasaki (Kawasaki City, Kanagawa Prefecture) in 1990.

Introduction of housing with long-term durability (KSI housing, etc.)

UR has adopted the Kikô (UR) Skeleton Infill housing system, which enhances the durability of the structural frames (Skeleton) (approx. 100 years) and clearly separates them from the interior facilities (Infill), so that the Infill part can be replaced to adapt to the change of lifestyle needs while the Skeleton part remains intact. The system is being introduced to housing properties in the Metropolitan area and ultra high-rise housing. By the end of FY2006, UR



[Figure 7: Private-sector business's submission for Koshigaya Lake Town]



[Figure 8: KSI housing system]

constructed around 14,000 KSI housing units.

In FY2007, the government launched the “200-year home” project to develop and proliferate more durable housing. UR plans to initiate a model project of its 200-year home program in FY2008.

(4) An environmentally considerate lifestyle

Workshops for outdoor space development in housing redevelopment

In the redevelopment of a housing complex, efforts are made to preserve or regenerate greenery within the compound, which serves as a precious environmental asset of the area. Workshops on outdoor space development are organized to take advantage of and carry over the sentiments of housing tenants, who have nurtured the greenery in the course of daily life.

Advocating environmentally-considerate lifestyles

UR is implementing the “New Suburban Living” initiative, providing an environment whereby residents can actively interact with rich natural resources such as greenery and water, so as to foster the local environment. Hands-on workshops on farming and rural landscape management are arranged to advocate suburban lifestyles. The initiative has sparked local residents’ voluntary activities for greenery management, environmental education on elementary school students and establishment of NPOs for rural landscape management, thereby promoting community development in symbiosis with nature and in line with local characteristics.

R&D and others

At its Urban Housing Technology Research Institute and other facilities, UR undertakes R&D into the preservation / regeneration of the natural environment, countermeasures for the Heat Island Phenomenon, energy conservation, and use of alternative energies, resource recycling and improvement of housing comfort. The findings have been reflected to UR’s rental properties for proliferation.

Environmental consideration is positioned as one of the most important R&D themes of the day, and R&D is underway for the following specific areas:

Research concerning community development (Development of energy-conservation cities/ Establishment of “wind paths” in city areas)

Research concerning stock-regenerating technology (Housing stock regeneration in building unit (Renaissance Plan)/ Cost reduction for KSI infill*/ Enhancement of durability for the skeleton of existing rental properties)

Research concerning facility-related technologies (Study on the actual use of energy at UR rental properties/ Outdoor space development technology with considerations paid to reducing environmental strains)

* KSI infill: Infill portion of the extended durability housing system under development by UR (UR’s version of the skeleton – infill housing system)

In the Office, we are implementing initiatives in line with the six specific actions for countering global warming, presented by the national campaign “Team 6% Reduction”, as promoted by the government’s Global Warming Prevention Headquarters. In summer and winter, thorough efforts are made to regulate the temperature setting for office air conditioners, and encourage workers to choose clothes to accommodate seasonal temperature fluctuations. The number of cars in the business fleet has been cut back, with employees being prompted to actively use public transportations. Staff has been thoroughly notified of initiatives of environmental considerations in their workplaces, such as turning off lights during lunch breaks, saving on

water use, and using stairs when going to floors not too far.

By the way, although employees in UR have a high level of interest in environmental issues, there is a passive in-house sentiment toward UR's environmental investments that compromised its business profitability. The future challenge will be to balance the environmental initiatives with business management.

But on WEB Questionnaire Survey to customer of UR, on the consciousness of price to merchandise and service with environment consideration, most of the respondents answered to pay even though the price and the rent were rather higher.

LASTLY

Since the establishment of its predecessor Housing & Urban Development Corporation 50 years ago, UR has implemented initiatives for environmental consideration in every sections. As the world recognizes the progress of global warming and the need for reinforcing countermeasures, UR is committed to promoting further initiatives for controlling global warming, and developing environmentally-friendly communities and people-friendly housing to create an environment.

REFERENCES

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