12. Environment

[Awareness of the Issues]

With the expansion and diversification of human activities, the decrease in greenery areas, etc. the emissions of residual heat and carbon dioxide has increased, and the temperature has risen. In fact, the average temperature has increased by about 0.6℃ globally and by 2 to 3℃ in urban areas in Japan over the past 100 years. This temperature increase is called the urban heat island phenomenon in big cities or global warming.

The urban heat island phenomenon is that of higher temperatures in urban areas than in their surrounding areas, caused by an increase in the surface of the earth covered by concrete or asphalt, a decrease in greenery areas, and an increase in heat discharged from air-conditioners and automobiles as a result of the development of urbanization. It is feared that the urban heat island phenomenon has aggravated our living environment, such as increases in hot nights, or so-called “tropical nights”, heat strokes during the summer, and cases of fever. Moreover, in winter, it worsens air pollution by forming inversion layers, or so called “dust domes”. These phenomena are found not only in large cities, but are also increasingly evident in surrounding areas, and tend to be expanded in local cities.

The mechanism of the urban heat island phenomenon is complex. It is now thought to be caused by the interaction of several factors such as artificial cover of the earth’s surface, artificial heat, city structure, geographical features and weather conditions. However, the exact mechanism remains uncertain. Therefore the central and local governments have implemented the limited measures, including using more energy saving equipment and increasing the amount of greenery areas. However, if we wait for the perfect elucidation of the mechanism of the urban heat island phenomenon, it may endanger our health and living environment, and also, it may pose restrictions on effective measures able to be taken to address the problem. Although the early elucidation of the mechanism is of course much awaited, it is necessary to take each measure comprehensively and systematically, such as the reduction of residual heat and the improvement of artificial cover and city structure, before the impact of urban heat island phenomenon become irreversible. Additionally, conditions of residual heat, the flow of sea or land breeze, and geographical conditions such as urban sprawl and the layout of rivers and greenery areas are believed to greatly affect the urban heat island phenomenon. Therefore, cooperation among relevant local governments and technical

and financial support from the central government is of great importance.

As for global warming, it refers to the adverse effect on both the natural ecosystem and human being. It is certainly the most important environmental issue for human life in terms of the scale and severity of its estimated impact. In order to reduce greenhouse gas emissions, the Kyoto Protocol was adopted in 1997 under which Japan is required to reduce the emission of six greenhouse gases including carbon dioxide by 6%. As a way to achieve the 6% reduction commitment stipulated in the Kyoto Protocol, converting the fossil fuel supply structure, which accounts for about 83% of the total primary energy supply, to a more environmentally friendly type with minimum carbon dioxide emissions, is very important. However, dependence on cheap coal fuel has increased following deregulation in the energy sector and the request for further efficiency increases; it cannot be denied that this has been one of the causes behind the increased carbon dioxide emissions.

Therefore, the implementation of fuel switching is required with a focus on the power generation field, in which increased use of such fuel as coal is expected. Especially, it is important that we are promoting the conversion to natural gas power plants which minimize carbon dioxide emissions. From this standpoint, in order to promote natural gas power plants at an early stage, it is necessary not only to establish the environment to promote the gas pipeline construction, which is stated on the 1st Report Regarding Promotion of Regulatory Reform, but also to discuss policies such as the simplification of the environmental assessment procedures .

In Japan, various problems relating to waste have been pointed out, for instance the volume of waste generation has been kept at the high level and illegal dumping has been increasing. In order to deal with these problems, actions have been taken in recent years, such as several amendments have been made on the Waste Management and Public Cleaning Law (Law No.137 of 1970 and it will hereinafter be referred to as "the Waste Management Law") and various laws relating to the promotion of recycling have been set. From now on, in line with the purpose of Basic Law for Establishing the Recycling-Based Society (Law No.110 of 2000) and with implementing these laws properly, it is necessary to actualize a so-called recycling-oriented society, in which the burden to the environment will be reduced as much as possible by reconsidering the way taken by the conventional society which is typified as mass production, mass consumption and mass waste generation.

Under the premise of ensuring the appropriate disposal of waste, it is necessary to promote the 3Rs, reduce, reuse, and recycle under an appropriate division of responsibilities among the citizens, businesses, the National government and local

government.

Also it is pointed out that the existing strict regulations (permission) in accordance with the Waste Management Law hinder the formation of recycle market, and it is necessary to examine the system, using the Basel Convention and the laws concerning waste disposal as a reference. Especially it is necessary that the activities should be conducted in a wide area in order to expand recycle markets. It is, therefore, very important to rationalize the regulations concerning waste disposal and recycling.

[Specific Measures]

1 Elimination of the urban heat island phenomenon in cities.

(1) Research and analysis of mechanism of the urban heat island phenomenon [To be implemented in FY2003]

In order to promote measures against the urban heat island phenomenon, it is necessary to further promote researches and analyses to elucidate the complicated mechanisms, such as the relevancy of each cause of the phenomenon and degree of its contribution. Furthermore, during the course of researches, it is also necessary to evaluate various measures such as the adoption of more energy saving equipment, water retainable pavements, and the introduction of more useful land and city construction. In doing so, the cooperation of the relevant national and local governments, universities and research centers is important, as is a system of collecting and sharing findings.

Moreover, in order to promote effective local government's measures against the urban heat island phenomenon, some supportive policies must be provided to local governmental bodies, which will enable them to collect geographical and weather data and to create simulation models applicable to appraisals for the effective measures.

(2) Promotion of measures against the urban heat island phenomenon

① Improvement of the city structure

a In the areas where the urban heat island phenomenon has already been apparent, urgent discussion is needed concerning the possibility of the waste heat disposal project, which is to divert heat discharged in cities to rivers and seas by using underground pipes which will run through the city. When the feasibility of this project is discussed, consideration must be given to the effects

of such a system and influences on the environment by the hot waste water. **[To be implemented no later than FY 2003 (study/conclusion)]**

b It has been pointed out that air released from greenery or water mitigates the burning heat in cities and is an effective measure against the urban heat island phenomenon. In an attempt to secure "Wind Roads" from greenery and water, it is necessary to improve the city structure, such as to create more greenery areas in cities, to network open spaces, and to rearrange city plans. Particularly important is the formation of urban districts. Items in need of consideration have to be disclosed to local public organizations. In addition, cooperation among these organizations needs to be enhanced when the urban heat island phenomenon covers more than one local area. **[To be initiated in FY 2003, and to be implemented successively]**

c The promotion of active efforts to secure more areas of greenery in cities through the establishment of a ground design for urban environmental infrastructure in metropolitan areas has to be given serious consideration. Designating a green belt area with the cooperation of local government is an effective way to keep, create and revive the natural environment in large urban areas and to alleviate the urban heat island phenomenon. **[To be implemented in FY 2003]**

② Reduction of artificial heat emission [Sequential operation]

In order to reduce the artificial heat discharged from automobiles, electrical apparatus, or air-conditioning units, necessary measures should be taken, such as the introduction of more energy saving consumer goods, building insulation systems, roof and wall greening, and the use of unutilized or natural energy.

③ Improvement of artificial covers [Sequential operation]

In order to reduce evaporation on artificial asphalt pavements as well as surface heat, some necessary measures should be taken. Such measures include the provision and maintenance of parks and greenery, planting more trees in streets, greening on roofs and on walls, and the installation of water facilities.

(3) Facilitating cooperation between relevant organizations under the urban heat island joint ministry meeting [To be implemented in FY2002]

The joint ministry meeting on policies and measures to mitigate the urban heat

island effect was established in September 2002 (the members of which are the Ministry of Environment, Ministry of Land, Infrastructure and Transportation, Ministry of Economy, Trade and Industry, and the General Council of City Reconstruction. Hereinafter referred to as “Joint Ministry Meeting”). There is a need to clarify the roles of the members in order to facilitate research results concerning effective measures to counter the heat island problem. At the same time, each measure should be connected to one another. Urgent attention should be paid to the creation of a systematical operation for constructing a comprehensive promotional system framework.

(4) Drawing up guideline for measures to prevent the urban heat island phenomenon [To be implemented in FY2003, and to be reviewed occasionally afterwards]

The guideline for measures to prevent the urban the heat island phenomenon including the previously mentioned measures should be drawn up by the Joint Ministry Meeting. This guideline should not be just a list of measures, but it should provide measures the comprehensively and systematically. For example, basic policies, the targets and deadlines of as many measures as possible, the short-range measures to take even if the mechanism of the phenomenon is not identified, and the long-range measures to take in view of reforming the sustainable city structure, is stated in the guideline. An examination of the progress in measures should be carried out, and as the identification of mechanism and the technological innovation of the measures are expected to occur somewhere along the line, the guideline should be reviewed flexibly.

2 Review of environmental assessment procedures concerning natural gas power plants in order to alleviate global warming.

Natural gas power plants are more effective in terms of alleviating global warming and also have lower environmental impacts in several respects than other types of thermal power plants. Therefore, it is necessary to examine the conditions on which the choice of items and methods in surveys, etc. is able to simplify from the standard items and methods in the procedure of environmental impact assessment when the construction of natural gas power plants as well as power plants with less land reformation and less environmental impacts are considered. **[To be launched in FY 2003: sequential examination afterwards]**

In terms of the survey nitrogen dioxide for the environmental assessment on the natural gas power plants, proponent should select a proper method from collection, arrangement and analysis of data based on available references and material or a field

survey, as a standard method for the prediction of its impact. Moreover, on the basis of the characteristics of the diffusion of nitrogen oxides, an appropriate and effective time should be spent on such surveys. However, relevant references and materials have not yet been sorted, and the diffusion condition of nitrogen oxides is changing throughout the year, so that they are obliged to conduct fieldsurvay for around a year.

Thereafter, it is necessary to accumulate the data on nitrogen oxides and climate condition based on the information of future cases, and to prepare a detabase that is available to the proponents. Additionally, the assembly and provision of information is also important relating to technological methods that show the project proponents how to consider the climate and geographical condition, the height of chimneys and the speed of smoke emission. **[To be launched in FY2003: sequential operation afterwards]**

3 Promotion of the formation of recycle markets and facilitation of proper waste managenent measures

(1) It is necessary to promote the effective waste disposal and recycling systems. To rationalize the framework of regulations on the Waste Management Law, the following measures should be taken. **[To be implemented in FY2003]**

① In order to promote waste disposal and recycling systems over a large area, it is necessary to promote the scheme that business operators dispose the wastes, which Minister of the Environment designates, without permission by each local government . In order to facilitate recycling at existing production facilities, Minister of the Environment can certify the recycle of certain wastes without the need of obtaining permission for waste disposal facilities and business operators. An expansion of the target approved for this certification system should be studied. Moreover, the measures should be taken for many business operators to obtain this certification.

② The permission procedures of waste disposal facilities, irrespective of the classification of domestic/industrial waste, should be simplified.

(2) In view of the results of the two items mentioned above, the overall system concerning the promotion of waste disposal and recycling should be studied continuously for the sake of further expanding recycle systems and securing proper waste disposal.**[Sequential examination]**