

### Role of the Panel

- TMG has been promoting the 3Rs and other programs to achieve its goal of “Creating a new urban model to fight the climate change crisis and resource depletion,” under the Tokyo Metropolitan Environmental Master Plan, formulated in 2008.
- To implement efforts to create a low-carbon society and a society with a sound material cycle in an integrated manner, the TMG launched a Panel for New 3Rs Strategy to obtain opinions from broad perspectives.

### Introduction (p. 1)

- Tokyo’s final waste disposal has decreased approx. 60% over the past 10 years thanks to efforts by citizens and businesses, etc., while TMG has aggressively implemented pioneering policies ahead of national initiatives to address the global environmental issues that are threatening our survival, to create a low-carbon urban city.
- However, the climate change crisis and resource constraints are posing great challenges on a global scale.
- The Panel discussed the desirable future direction of policies and measures pertaining to the sustainable use of resources from a global perspective, aiming to create a sustainable society.

### Chapter 1 Current Status and Challenges in the Use of Resources (pp. 2–9)

#### 1 Current status of the use of resources

- Japan’s annual resource use is 1.79 billion tons, 44% of which are imports, and only 12% are recycled materials.
- A study of Japan’s material flows reveals a dependence on natural resources, large GHG emissions, and the risk of growth in final waste disposal volumes.
- In the future, the growth of the world’s population and rapid economic growth in the BRICs and other economies may increase the overall global use of resources and result in a depletion of resources.

#### 2 Issues around the use of resources

(The following three issues need careful consideration)

##### (1) Natural resource extraction

- Issues around the extraction of natural resources are twofold: environmental impact and the supply of the resources themselves.
- Accurate information on these issues and a comparison with the use of recycled materials is important but not sufficiently available.

##### (2) GHG emissions

- Increased resource use may lead to increased GHG emissions, resulting in a worsening of the climate change crisis.
- Use of recycled materials may reduce GHG emissions but there is insufficient information sharing on the benefits.

##### (3) Final waste disposal

- Final waste disposal has been reduced, but further progress is needed given Japan’s land use status.

#### 3 Issues by resource category

- Biomass resources such as wood are renewable but depend heavily on imports.
- Fossil-derived resources such as plastics are non-renewable and exhaustible, and depend heavily on imports.
- Challenges with metal resources such as iron and copper include the risk of using up reserves and the large environmental impact, e.g., massive dumping of unused rock and CO<sub>2</sub> emissions during extraction and production.
- Challenges with ceramic, soil/rock resources: possible demand shortage for recycled materials and large CO<sub>2</sub> emissions during production (e.g. cement, etc.).

### Chapter 2 Basic Approach to Strategy for the Sustainable Use of Resources (pp. 10–11)

#### 1 Principles of sustainable resource use and integrated strategy

- We have no choice but to achieve the sustainable use of resources, based on the following principles:
  - (1) Renewable resources should be used to the maximum extent possible, and should be used within a level that allows for their renewal in the long term;
  - (2) If unavoidable, non-renewable resources may be used within a level that allows them to be substituted by other materials or energy sources; and
  - (3) Environmental impact from human activities should remain within the capacity of the environment to restore itself.
- To achieve sustainable resource use, it is necessary to develop a new strategy for the sustainable use of resources with the aim of reducing the extraction of natural resources, GHG emissions, and final waste disposal with an integrated approach.

#### 2 Tokyo’s responsibilities

- Tokyo is a high-consumption megacity and a hub of networks where people, goods, and information flow in from all over the world and its initiatives to promote the cyclical use of resources can and should play an important role.
- To fulfill this role effectively, it is important to assess the lifecycle-wide environmental impact associated with use of resources in Tokyo, irrespective of the place where the impact is felt.
- As the basis of assessing the input of natural resources, GHG emissions, and final waste disposal, the final demand in Tokyo calculated from an analysis of an inter-industry analysis would be useful. These possible actions need to be studied further.

### Chapter 3 Specific Direction of Strategy on the Sustainable Use of Resources (pp. 12–19)

#### 1 Approaches to both artery and vein processes

- While the term “reduction” is generally interpreted as a reduction in the generation of waste, it should rather be considered as minimization or optimization of the use of resources.
- It is important to promote the cyclical use of resources in line with the basic priorities in the order reuse, materials recycling, and thermal recycling.
- On the artery side, it is important to promote a shift in the choice of raw materials to the use of renewable resources, and to highly functional materials made from elements with less availability constraint.

#### 2 Reducing the extraction of natural resources

##### —Promoting the cyclical use of metals and other natural resources—

- TMR and ecological footprints are important for metal resources and biomass resources, respectively.
- To ensure a consistent supply of metal resources and to reduce the environmental impact associated with resource extraction, we need to encourage the development of easy-to-separate-and-recycle product designs and develop a mechanism to collect discarded small electronic devices, etc.
- It is also important to promote the cyclical use of other beneficial elements, such as phosphorus, which is necessary for food production but which is supplied entirely by imports.

#### 3. Reducing GHG emissions

##### —Visualizing avoided GHGs from the cyclical use of resources—

- To establish how recycled materials can bring reductions, it is important to consider introducing a mechanism to make reductions in GHG emissions from the cyclical use of resources in the vein processes visible.
- It is necessary to formulate common calculation rules for reductions in GHG emissions from the cyclical use of resources, and to facilitate appropriate evaluation for recycling vendors’ activities and more active implementation of recycling programs by Tokyo’s wards and municipalities.

#### 4. Reducing final waste disposal

##### —Response to the declining demand for recycled materials with the maturation of cities—

- As cities mature, improvement projects are likely to outnumber construction starts; and the production of waste concrete is likely to exceed the demand for recycling. To prevent this scenario, it is necessary to extend the useful life of buildings and structures as well as to expand recycling “from building construction to building construction.”

#### Towards 2050 (p. 20)

- We need to establish a vision for 2050 that defines the ideal way of using resources, and use it as a guide to reducing the extraction of natural resources, GHG emissions, and final waste disposal.
- Now is the time to move toward with dematerialization and dramatically improve resource productivity.
- Toward 2050, citizens, businesses, and governmental organizations in Tokyo must think globally and start to take actions in their daily activities with strong awareness and commitment to achieving sustainable resource use.