

## APPENDIX F

### Summary of Thematic Session 1

#### a) Thematic Session 1A: Solid Waste Management

This session was chaired by Mushtaq Memon (Programme Officer, UNEP-IETC) and co-chaired by Kazunobu Onogawa (Senior Fellow IGES and former UNCRD Director). A total of 6 presentations were made:

1. **'Solid Waste Reduction and Methane Gas Utilization at City Landfill'** by Mr. Suryanto (Head, Local Planning Agency, Balikpapan City Government);
2. **'Building Eco-Cities towards Zero Waste Communities'** by Mr. Kazunori Hisanabe, (Chief Executive, Kitakyushu Asian Center for Low Carbon Society Kitakyushu City, Japan);
3. **'Cooperation between Ho Chi Minh City and Osaka City in Solid Waste Management'** by Mr. Dao Anh Kiet (Director of Ho Chi Minh City, Department of Natural Resources and Environment; and Standing Vice Chairman of Ho Chi Minh City Climate Change Steering Board, Climate Change Bureau, Ho Chi Minh City) and Mr. Kenji Shiraishi, (Director, Global Environment Centre Foundation (GEC), Japan);
4. **'Current Situation and Orientation of Solid Waste Management in Da Nang City'** by Dr. Nguyen Dinh Anh (Vice Director, Department of Natural Resources and Environment, Da Nang City);
5. **'Making Penang a Liveable City- Good Integrated Solid Waste Management'** by Mr. Khor Hung Teik (Hon. President, Zero Waste Malaysia);
6. **'Waste to Energy Technology for Clean & Technology for Clean & Recycle Society'** by Mr. Hajime Fukai (Manager, Environmental Plant Engineering Dept., Overseas Business Sector, JFE Engineering Corporation).

**Mr. Suryanto (Head, Local Planning Agency, Balikpapan City Government)** presented 'Solid Waste Reduction and Methane Gas Utilization at City Landfill'. Balikpapan City, located in East Kalimantan, commits to environmental sustainability through land-use planning to harmonise environmental conservation and development. Through 3R activities, such as small-scale composting and Solid Waste Banks, as well as expansion of an integrated waste management approach in collaboration with households, markets, communities, schools and businesses, the city successfully

decoupled the amount of waste going to landfill from the amount of waste generated. Also, utilisation of methane gas recovered from its Manggar Landfill has been conducted through the collaboration between private companies and the community. These activities will continue to be expanded and enhanced further.

**Mr. Kazunori Hisanabe, (Chief Executive, Kitakyushu Asian Center for Low Carbon Society Kitakyushu City, Japan)** presented 'Building Eco-Cities towards Zero Waste Communities'. Kitakyushu – one of Japan's industrial growth engines – was once well-known for serious environmental pollution from highly polluting heavy and chemical industries. Motivated by the side to shed its 'dirty' image, the city embarked on intensive efforts to combat industrial pollution through partnerships among stakeholders, especially those led by citizens and local community groups. The city also adopted and enforced comprehensive pollution regulation and control measures. Today, the city has gained a reputation as a leading environmental/green model sustainable city, both domestically and internationally.

Advanced and efficient solid waste management (SWM) systems, including for recycling, as well as active source-separation at households through have resulted in 27% reduction in waste generation and slashed waste treatment costs by approximately JPY1.9 billion. To obtain the support and cooperation of its citizens, the city provided thorough explanation about its vision and initiatives via meetings with local communities. Also, Kitakyushu City pioneered an initiative called 'Eco-town' to spearhead the development and implementation of advanced environmental technologies and industries, contributing to the creation of Japan's Sound Material Cycle Policy. The city is now expanding the spread of its good practices internationally, including through city-to-city collaborations with Dalian (China) on air pollution, Phnom Penh (Cambodia) on waterworks, Surabaya and Balikpapan (Indonesia) on solid waste management and environmental education.

**Mr. Dao Anh Kiet (Director of Ho Chi Minh City, Department of Natural Resources and Environment; and Standing Vice Chairman of Ho Chi Minh City Climate Change Steering Board, Climate Change Bureau, Ho Chi Minh City)** and **Mr. Kenji Shiraishi, (Director, Global Environment Centre Foundation (GEC), Japan)** made on a joint presentation on 'Cooperation between Ho Chi Minh City and Osaka City in Solid Waste Management'. Osaka city – with long experience in improving the urban environment, particularly in SWM – has been trying to share its experiences

internationally through various international partnerships such as cooperation between UNEP/IETC and GEC or Osaka Water and Environment Solution Association. Cooperation between HCMC and Osaka in SWM commenced officially started in February 2012. With the view of developing successful model projects, various collaborative activities with HCMC have been conducted covering training programmes, project studies as well as national seminars in the area of sewage and flood control, SWM, and water supply. Assistance has also gone into the development of HCMC's policies for waste management and the 3R as well as in capacity building. Osaka city is proposing piloting an ISWM-oriented system, which includes waste power generation. The Osaka-HCMC collaboration has been bolstered by linkages with national-level collaborative relationship between Viet Nam and Ministry of the Environment of Japan, supported with coordination by IGES.

HCMC's SWM system has been dependent on landfills (more than 90%) and there is no segregation of household wastes at source. In landfills, the main problems are leachate and methane gas emissions. Though composting has been piloted, there are challenges in improving and expanding the practice. Despite a large number of private waste collectors, difficulties persist in collecting waste fees; hence, financial resources are inadequate for daily operations as well as for investment. Of late, several formal recycling and treatment facilities that are integrated into the formal waste management system have been established. However, HCMC still lacks an enabling policy environment to support proper SWM, particularly in terms of the absence of national legislation or frameworks to facilitate 3R activities with the participation of community-based organisations and NGOs.

Overall, HCMC still lacks experience and expertise in both policy design and practical implementation. To overcome these challenges, HCMC and Osaka city will carry on collaboration to promote waste separation at source, develop 3R action plans, analyse feasibilities of waste-to-energy systems and build staff capacity. HCMC has benefited from increased knowledge exchange with experts. To improve the effectiveness of city-to-city cooperation, cities need to clarify the actual demands and needs of their partners in a comprehensive manner. Also, such cooperation would benefit from central government directive and support.

**Dr. Nguyen Dinh Anh (Vice Director, Department of Natural Resources and Environment, Da Nang City)** presented "Current situation and orientation of solid

waste management in Da Nang city". Da Nang, located in the central area of Viet Nam, is undergoing urban infrastructure renovation. Solid waste is increasing at a rate of 2.5 - 2.9% annually, while the collection rate is about 90% in 2012, with most collected waste being sent to Khanh Son Landfill. Recently, Da Nang city developed its ISWM plan towards 2020. The current state of municipal solid waste (MSW) management in Da Nang is characterised by a high waste collection rate which also contributes to job creation. However, separation at source and the 3Rs are not implemented due to gaps in infrastructure, institutional frameworks and financial resources. Nevertheless, Da Nang city is striving to become an 'eco-city' and a model for others in Viet Nam. There are several on-going demonstrative projects to utilise wastes as resources and to introduce ISWM concepts and practices. Da Nang city seeks support and collaboration with supporting stakeholders on several areas, such as the promotion of public-private sector partnerships, waste exchange programme, high quality compost production from high-volume sources and biogas generation from sewage sludge.

**Mr. Khor Hung Teik, (Hon. President, Zero Waste Malaysia)** presented 'Making Penang a Liveable City - Good Integrated Solid Waste Management'. In order to minimise and divert waste from its landfills, the Penang government has implemented numerous innovative grassroots programmes and activities like recycling banks (buy-back centres) and material recovery facilities for collecting used cooking oil and food wastes from restaurants which are processed into compost, bio-liquid fertilizer and top soil. Other measures include banning free plastic shopping bags and styrofoam food containers. Penang's organic food waste management policy experience has shown that SWM should be pursued in collaboration with stakeholders, especially through public-private smart partnerships.

**Mr. Hajime Fukai, (Manager, Environmental Plant Engineering Dept., Overseas Business Sector, JFE Engineering Corporation)** presented 'Waste to Energy Technology for Clean & Technology for Clean & Recycle Society'. JFE Engineering Corporation (JFE) has set up 160 incinerators in Japan and 7 plants in overseas. Also, JFE is operating recycling businesses in Japan, including e-waste recycling facilities. Advanced WTE technology provides multiple benefits in terms of power generation, heat utilisation, material recovery, and waste reduction, while also decreasing other environmental impacts. There are two main types of incineration technologies – stalker and gasification plants. JFE's gasification technology is able to treat a wide range of materials as well as reduce dioxins. Through a long history of R&D and innovation,

JFE's technology has managed to achieve stable combustion capacity, even for low calorie wastes. The focus of future technological development is towards the establishment of integrated systems.

## **Discussion and Q&A**

*Why does source separation tend to fail in many cities?*

A: In the case of HCMC, we had implemented many trials and pilot projects on source separation, but those had not met with much success until more recently. In 1999, we introduced a very small-scale pilot to segregate organic waste and other wastes, which was then expanded to the utilisation of mini-baskets for source separation with additional donor support. Subsequently, we tried to scale up source separation to the whole city, but were held back by an economic crisis. Now, we think that 'social organisations' such as NGOs, women's association, and other type of community organisations are the keys for successful practices for source separation and seek collaboration with these organisations. Also, it is crucial to consider the entire chain of waste management from source separation, collection, recycling to treatment. In other words, without interventions in these stages through a comprehensive approach, source separation in isolation is meaningless.

*How did Kitakyushu manage to achieve 27% waste reduction?*

Promoting public awareness is the key to success. We need to transform the citizens' mindset – from orientation to mass production, consumption and recycling – to resource saving as well as total reduction of consumption. Kitakyushu used a 'stick and carrot' approach. For example, as a stick, we introduced volume-based waste charges. Careful calculation and pricing of waste collection bags were done, based on transparent information disclosure of waste management costs. From this, we concluded that the appropriate handling cost per bag of waste collected should be about JPY200. Hence, we asked citizens to bear 30% of this cost (about JPY60). On the other hand, we charged JPY15, a lesser price, for each bag for recyclable waste. With this price signal, we gave incentives for separating recyclables from the waste stream. At the same time, we provided technical support to communities on recycling activities e.g. recycling used paper.

## **b) Thematic 1B: Urban Water and Sanitation**

This session was chaired by Dr. Minh Nguyen (Senior Research Scientist, CSIRO, Australia). There were a total of 5 presentations:

1. **'Innovative Urban Water Demand Management'** by Mr. Bruce Edwards (Assistant Secretary, Environment Quality Division, Department of Sustainability, Environment, Water, Population and Communities, Government of Australia);
2. **'The Case of Eco-green City in Korea – Sewage Management in Gangneung City'** by Mr. Jung Gyesoo (Assistant Manager, Korea Environment Corporation);
3. **'Integrated Urban Waste management in a Changing Climate'** by Prof. Mary Selintung (Lecturer, Civil and Environmental Engineering Department, Faculty of Engineering, Hasanuddin University, Makassar, Indonesia);
4. **'Capacity Building through Development of Sustainable Urban Water Systems in Adapting to the Changing Environment'** by Mr. Ky Quang Vinh (Director, Climate Change Coordination Office, Can Tho City);
5. **'Pilot implementation of Jokaso system in Jakarta'** by Mr. Masanobu Iwahashi (Assistant Manager, Kubota Corporation).

**Mr. Bruce Edwards (Assistant Secretary, Environment Quality Division, Department of Sustainability, Environment, Water, Population and Communities, Government of Australia)** presented on 'Innovative Urban Water Demand Management'. He began by introducing the unusual water distribution scenario in Australia, where 87% of the total population reside in the southern urban areas, yet 65% of rainfall is in the northern area. He shared Australia's experience of the 10-year drought (2002 to 2012), during which Australian cities secured urban water supplies by establishing desalination plants.

The National Water Initiative (NWI) announced by the government in 2004 represents a shared commitment to sustainable water management resource management. Under this, a National Water Commission was established as an independent body to provide guidance on: efficient water pricing for sustainable use; national performance reports on water utilities; water efficiency labeling and standards for appliances; improved waste information and accounting; and guidance on water sensitive cities. The initiative aims to increase the efficiency of water use, providing greater certainty for investment and the

environment, and underpinning the capacity of water management regimes. Looking to the future, challenges remain in terms maintaining the reform momentum. Australia needs to engage the community on water management decisions – particularly building awareness that highly reliable, good quality water and sanitation services are costly, as well as ensure that the variability in water resources is represented in future water planning and investment decisions, and that emerging data and findings are taken up.

**Mr. Jung Gyesoo (Assistant Manager, Korea Environment Corporation)** presented on 'The Case of Eco-green City in Korea-sewage Management in Gangneung City'. Mr. Jung introduced the current on-going pilot project of combined reuse system of treated sewage and rain water in Gangneung city as an initiative of Korean government to promote the low carbon green city project. In the project, treated sewage, rain water, and waste water are treated for the use for cleaning water, indoor water, recreation water, and industrial water. Also, the smart water management system – which integrates the management for generation of sewage and rain water, management of non-point sources, treatment for reuse, and water supply – was developed for stable and efficient supply of treated water. The pilot project of the demonstration plant with a treatment capacity of 100m<sup>3</sup>/day is verified for its performance and economics of the plant operations. After further assessments, and the package proposal will be applied to the whole city.

**Prof. Mary Selintung, Makassar (Lecturer, Civil and Environmental Engineering Department, Faculty of Engineering, Hasanuddin University, Makassar, Indonesia)** presented on 'Integrated Urban Waste management in a Changing Climate'. Prof. Selintung explained the impacts of climate change and urban development on future water security and adaptation option for cities in her presentation. Makassar is the largest and most urbanised city in eastern Indonesia and is a major economic, government, and educational centre for South Sulawesi Province. The Makassar municipal water company (PDAM) supplies around 62% of the population, while the city's Millennium Development Goal (MDG's) targets to increase this coverage to 78% by 2015. Pressure will be mounting on the water supply system, with urbanisation, population growth, limited economic resources, limited infrastructure and climate change, it is important to manage water consumption and improve access to clean water in the city.

The Climate Adaptation Through Sustainable Urban Development (SUD) project funded

by the CSIRO- AusAID Research for Development Alliance (2010 – 2012) engaged local policy makers and urban managers to improve understanding of (i) Makassar's current and future water services and challenges; and (ii) most feasible options for improving access to clean water and adapting to potential impacts of climate change. The identification of adaptation options was performed using Integrated Urban Water Management (IUWM) principles which consider the overall water cycle in the management of water supply, storm water and wastewater. From project findings, the following recommendations were derived: i) extend future water security assessment while also ensuring these findings are incorporated into future planning effort; ii) undertake community campaigns to raise awareness on sustainability and climate adaptation across the wider community; iii) protect water source areas with regulatory measures; iv) reduce non-revenue water; and v) build partnerships for implementing water efficiently programmes, appliances and affordable technologies.

**Mr. Ky Quang Vinh, Can Tho** presented on “Capacity Building through Development of Sustainable Urban Water Systems in Adapting to the Changing Environment”. Can Tho City is under pressure from rapid urbanisation and industrialisation and potential impacts of climate change. Mr. Vinh introduced the project supported by AusAID and CSIRO Alliance on development a sustainable urban development framework to improve the planning of the city's water systems. The project aimed to supporting planning and investment decisions to improve access to clean water and sanitation and managing the impacts of urban development and climate change on the environment and people's livelihood with a main focuses on stakeholder engagement, partnership and capacity building. For the stakeholder engagement, stakeholders played a central role in identifying issues and co-developed strategic option through the various structured workshops. For the capacity building through collaboration and partnership, a three-stages capacity building approach was conducted as following: firstly, CSIRO conducted training for key stakeholders in English in Australia; secondly, provided hands-on training and technical support to key stakeholders in Can Tho; and finally, key local stakeholders trained local stakeholders in local language (Vietnamese).

**Mr. Masaanobu Iwahashi (Assistant Manager, Kubota Corporation)** presented on ‘Pilot implementation of Jokaso system in Jakarta’. Mr. Iwahashi explained that the sanitation coverage in Jakarta city is only 2% of the total population. Due to the rapid urbanisation as well as high population density, it is difficult to connect pipelines to individual households and buildings. The ‘Jokaso’ decentralised, on-site sewage

treatment system – developed by Kubota corporation through its long history and experience in dealing with wastewater treatment issues – is proposed as an appropriate solution to help address the sanitation challenges faced by Jakarta city. Mr. Iwahashi shared Kubota's experiences of pilot installations of Jokaso in Jakarta, which had yielded positive test results on treated water quality and demonstrated equivalent price-performance factors, compared to other options like septic tanks and sewage treatment plants. These studies also gathered useful information for further improving the system's performance and design to suit local conditions. Besides implementing appropriate and effective technology, governmental actions such as mandating and enforcing water quality standards, certification of water treatment products/systems and other policy framework are required.

Discussion:

1. There is a need to promote the application of Integrated Urban Water Management principles into practices as an effective way for ESC. For cities in developing countries, more focus should be on sanitation issues, and more knowledge on climate change impacts should be generated for planning adaptation solutions.
2. Capacity building should be conducted with strong relationship development through upfront engagement, partnership, knowledge & skill transfer, and shared ownership. This will foster trust, leading to commitment and active involvement, and thus support of the local community and local stakeholders, facilitating effective implementation of policies and practices for urban sustainable development.
3. There is also a need to facilitate knowledge exchange within or across the region, foster innovation and collaborative learning; such as through a regional inter-governmental working group responsible for urban water, waste and environmental sanitation management. Regular communication is essential.

### **c) Thematic Session 1C: Co-benefits in Clear Air Planning**

This session was chaired by Ms. May Ajero (Air Quality Program Manager, Clean Air Asia) and co-chaired by Mr. Roland Haas (Director of the Programme 'Cities, Environment and Transport in the ASEAN Region', GIZ). There were a total of 5 presentations:

1. **'Yokohama Smart City Project'** by Mr. Masaki Kamata (Project Promotion Section, Planning and Coordination Department, Climate Change Policy Headquarters, Yokohama City, Japan);
2. **'Clean Air for Smaller Cities in the ASEAN Region'** by Mr. Bunleu Narapinit, (Senior Sanitation Officer, Department of Public Health and Environment, Nakhon Ratchasima Municipality);
3. **'Environmentally Sustainable Initiatives towards a Low Carbon City'** by Hon. Datuk Abang Abdul Wahap bin Abang Julai (Mayor, Commission of the City of Kuching North);
4. **'Creation of Carbon Credits by Water Savings'** by Mr. Yasutoshi Shimizu (Senior Research Manager, ESG Promotion Dept., TOTO Ltd.);
5. **'Opportunities for co-benefits in City Planning'** by Ms. May Ajero, Air Quality Program Manager, Clean Air Asia.

**Mr. Masaki Kamata, Yokohama City (Project Promotion Section, Planning and Coordination Department, Climate Change Policy Headquarters, Yokohama City, Japan)** presented 'Yokohama Smart City Project', which is engaging in smart technologies in energy and transport, and is partnering with businesses and private sector as well as their citizens in achieving their goals of green growth. Some of its cutting-edge innovations are in Home Energy Management System (HEMS), Building Energy Management System (BEMS), electric vehicles etc. With citizen participation, Yokohama local government achieved a 30% reduction in household waste in three years. Yokohama's co-benefits model is based in achieving and keeping with their environmental, social and economic values. Yokohama also conducts business matching between leading Japanese companies with small to medium enterprises (SMEs) for stimulate job creation. With its rich experience of overcoming social and environmental issues stemming from rapid urbanisation between 1960 and 1980, Yokohama is also interested in sharing their experience with other Asian cities, and is actively supporting platforms like CITYNET, C40 Cities and World Bank's Eco<sup>2</sup> Cities

initiative.

**Mr. Bunleu Narapinit (Senior Sanitation Officer, Department of Public Health and Environment, Nakhon Ratchasima Municipality)** presented on 'Clean Air for Smaller Cities in the ASEAN Region' and shared their efforts in implementing clean air programmes. Korat is a small but fast growing city, located a few hours away from Thailand's capital city of Bangkok. It is the capital centre of Nakhon Ratchasima province, with a population of 173,117, making it the third-biggest city in Thailand. The transport sector is growing in the city and air pollution from traffic, factories, constructions, crematoriums and open burning is a growing concern.

In 2009, the city embarked on an air quality project to identify measures and steps required to achieve clean air in the city. In moving towards clean air planning, an important step taken by Korat was to conduct a stakeholder consultation where the city mayor and officials were involved in a dialogue with city residents and important stakeholders – including university representatives, community leaders and government offices to set-up the city goals and vision. Other key activities were the development of emission inventory, air quality monitoring, review of air monitoring network as well as the public transportation and urban development system by experts. Korat is planning to expand air quality management activities to the next stage by setting up a clean air board and steering as well as enhancing its clean air action plans and emission inventory work.

**Hon. Datuk Abang Abdul Wahap bin Abang Julai (Mayor, Commission of the City of Kuching North)** presented 'Environmentally Sustainable Initiatives towards a Low Carbon City'. North Kuching is a city of around 200,000 people with a vision for a clean, beautiful and safe city. Kuching aims to become 'the most talked-about city in Asia by 2017'. This vision guides their green city initiatives in all key sectors, including clean air and green transport. It is promotion of biking in the city and a 6km bicycle trail is being built. The city is planning to expand its river water taxi system while proposing in bus rapid transit system as alternative transportation options. It actively embraces green technology in buildings, particularly for lighting (LED, solar and wind powered lighting). It takes urban greening seriously, and has set up a 'Tree Bank' which enabled 2.6 million saplings to be planted within 5 years.

**Mr. Yasutoshi Shimizu (Senior Research Manager, ESG Promotion Dept., TOTO Ltd.)**

presented 'Creation of Carbon Credits by Water Savings'. TOTO's core business is manufacturing water-saving bathroom technologies and products. From the viewpoint of a business, improving the environmental performance of products is as way to help realise sustainable development of Asian countries. Water supply is an energy-intensive sector, as much electricity is expended in treatment and pumping systems. Hence, water-saving technologies contribute to energy savings by reducing the volume of treated water consumed per activity, and this further translates into CO<sub>2</sub> emission reductions. Water consumption in developing ASEAN countries is expected to rise dramatically in line with urbanisation, population growth and economic prosperity. Incorporating water-saving technology into infrastructure design in developing ASEAN countries would create the potential for reducing a signification amount of CO<sub>2</sub> reductions while also improving quality of life.

**Ms. May Ajero (Air Quality Program Manager, Clean Air Asia)** presented "Opportunities for co-benefits in City Planning". While climate change is high on the agenda of donor assistance, findings show that only 3% of cities have climate change plans, while only a few out of those actually integrate climate change plans with air pollution mitigation. The co-benefits approach allows cities to link (often already identified) air quality (as well as other urban growth issues, such as transport and energy) with carefully selected policy packages to obtain maximum reduction in both air pollutant and GHG emissions. A wide range of existing tools may help policy makers evaluate the emissions reduction potential and integrate policies in key mitigation sectors of land use, air, transport and energy. Ultimately, cities can address the root causes of climate change through promoting mixed land use, public and non-motorised transport as well as cleaner energy sources and energy-efficient buildings, among others.

**Mr. Roland Haas (Director of the Programme 'Cities, Environment and Transport in the ASEAN Region', GIZ)** gave an overview of the ASEAN – German Technical Cooperation Programme "Cities, Environment and Transport" which has most – if not all – of its activities aimed at realising co-benefits of air pollution, climate change, energy, transport at the city-level. Capacity building activities comprise a main component of these programmes.

Discussion:

1. Through the co-benefits approach, cities will be better able to link environmental measures (especially for air pollution) and plans with climate change mitigation and thus can more easily reduce the overall costs of dealing with both issues.
2. Application of a co-benefits approach can also lead to faster adoption of GHG mitigation measures, resulting in earlier reductions in both GHG and air pollutant emissions.
3. There is a wide range of opportunities and tools available for the cities to adopt co-benefits approach as a means to achieve environmental sustainability.
4. Co-benefits of low-carbon initiatives are maximised when linked with city vision and goals for transport, waste, housing and energy, as well as job creation and economic development.
5. Stakeholder participation is important. Citizens, private sector, development agencies and other international organisations can play important roles to support cities to better integrate environment plans, clean air plans and low carbon plans.