

MINUTES of

The 4th Tripartite Roundtable on Environmental Business

Dates: June 22nd-24th, 2018

Location: Suzhou, China

Theme: Environmentally sustainable city for promoting the transition to green economy

Participants: Chinese, Japanese, Korean delegates

OPENING SESSION

An introduction of the 4th TREB meeting was made by **Mr. SHI Feng, Deputy Director of China-ASEAN Environmental Cooperation Center (China)**.

Ms. ZHOU Guomei, Acting Director General of China-ASEAN Environmental Cooperation Center (China), made an opening address welcoming all delegates from China, Japan and Korea. She stated the past accomplishment and contributions of the meeting. With active participation in Tripartite Joint Action Plan on Environmental Cooperation (2015-2019), for meeting the objective of this year's meeting which aims to boost communication and exchange experiences amongst enterprises in the three nations, she put forward a few suggestions which includes making joint R&D investment on developing core environmental technologies, expanding the trade on green products and services, and building technical cooperation network on pollution prevention and control technology. She ended the address thanking all the delegates for contributing to the success of the 4th Tripartite Roundtable on Environmental Business.

Mr. YANG Zhiping, Secretary General of the People's Government of Suzhou Municipality (China), gave a welcoming address, expressing his

hopes to find efficient solutions to environmental issues in all three nations through the tripartite roundtable.

Mr. KIM Doo Hwan, Professor of SangMyung University (Korea), gave a brief summary of last year's 3rd TREB meeting.

Commemorative photograph was taken during the photo session.

SESSION 2: Practices on Environmentally Sustainable City

Mr. GOTO Toshihiko, CEO, Sustainability Forum Japan (Japan), the Chair of Session 2, expressed his hopes to find positive measures for development of sustainable cities based on actual practices and experiences from the three nations, and introduced the first speaker of the session.

Ms. ZHANG Yuan, Associated Professor of Suzhou University of Science and Technology (China), delivered a speech on "Research on Sustainable Development Strategy in Suzhou". She began the speech with an introduction of urban sustainable development from the perspectives of resources, environment, economy and society. She first introduced two main reasons to emphasize the necessity of sustainable development in Suzhou. The two reasons are the contradiction between population development and resources and energy, and low ecological carrying capacity resulting from the outstanding environmental problems. She then introduced six main strategies of sustainable development in Suzhou which include the design of ecological functional regionalization as the main product of ecological civilization planning; adoption of "Sponge City"; development of the operation of reclaimed water reuse; application of artificial intelligence in sewage pipe network management; adoption of diversified treatment options for contaminated soil; and the application of green functional restoration materials. She also described the positive water and atmospheric quality effect after implementing Suzhou sustainable development strategies.

Mr. DING Nanhua, Director of Jiangsu New Epoch E.P.Co., Ltd. (China), delivered a presentation on “The Application Prospect of Drinking Water Market in ‘Belt and Road’ Countries”. He first gave a brief introduction of development history of New Epoch & Dagua including the projects implemented and technical exchange in Southeast Asia. He then introduced the water treatment technologies that are suitable for countries in Southeast Asia. They are Super Strong Ozone Oxidation Water Treatment Innovative Technology and XJYFJ Type Unpowered Integrated Water Purifier System. He also emphasized that Dagua drinking water treatment is cost-saving, chemicals-free, easily operated, and highly efficient. He then highlighted that the first Dagua 100t/d equipment successfully assembled in China has received the patent certificate and technical certification of IWA.

Ms. CHOI Jina, Team Manager of Korea Environmental Industry Association (Korea), presented on “Cases of Sustainable Environmental Cities in Korea”. She first explained that the environment-friendly energy town is defined as induce voluntary installation of environmental facilities through improvement of income by the residents by adding profit generation model for the residents including generation of energy and cultural tourism to unwanted and unpleasant facilities. After introducing the goals and current status of distribution in Korea, overview and outcomes of pilot environment-friendly energy town projects in Hongcheon were given. She then analyzed the success factors of the pilot projects and demonstrated the current status of pursuit of environment-friendly energy town in Korea using cases of Cheongju-si, Asan-si, Gyeongju-si, Yangsan-si, etc. She also mentioned the Sustainable City Program in Seoul which contains 2 phases. Phase 1 - ‘One Less Nuclear Power Plant’ as the energy policy of Seoul Metropolitan City aims to reduce the quantity of energy produced by 1 nuclear power plant. She listed the good performances of this energy policy which cover the propagation of solar power generation facilities, eco-mileage, and increased energy efficiency in buildings (BRP) and proliferation of LED lighting. Phase 2 – ‘Seoul Sustainable Energy Action Plan’ with the purposes of promoting energy self-sufficiency, the energy sharing and energy participation have made contribution to build energy

dispersion type production city and efficient low-consumption social structure, and to provide energy related jobs through innovation and to create community for sharing warm energy.

Mr. ARIMA Takanori, Director of International Environmental Strategies Division, City of Kitakyushu (Japan), delivered a presentation on 'Kitakyushu's Challenging As a "Glocal Leader" for Green Growth & SDGs Promotion'. He began his speech with an introduction of friendship between China and Kitakyushu. Kitakyushu tried to overcome the pollution problems resulting from industrial development through building a partnership across government, citizens and private companies. With the acceleration of economic development, new environmental industries including energy management and local energy companies have emerged. Kitakyushu Eco-Town project as an example aims for zero greenhouse gas emission through the collaboration with the suppliers to trade waste that can be recycled for raw materials. He then introduced that Kitakyushu as an environmental advanced city increasingly expanded its overseas network to develop environmental technologies of Kitakyushu. It also built intercity cooperation with the city in the South Asian countries as well as in China, 6 cities including Shanghai, Tianjin, Wuhan, Tangshan, Handan and Dalian, based on the discussion in the 16th TEMM. The important role of Kitakyushu to promote SDGs were highlighted. He stated that since Kitakyushu are facing challenges toward localizing SDGs, it has made contribution to achieve SDGs which includes the Future City Initiative selected by Japanese government and SDGs Pilot Model City for territorial approach by OECD. He ended the presentation by stating that 'upon developing international environmental cooperation and environmental businesses, we are aiming to promoting our unprecedented way delighted and respected by people on the spot.'

During discussion time, an active discussion was made.

1) **Ms. ZHOU Guomei (China)** asked **Mr. ARIMA Takanori (China)** to share the best practices of garbage classification in Kitakyushu. Mr. ARIMA

Takanori answered that household waste are recycled in each community-unit and large objects are recycled separately. Both of them will be charged.

- 2) **Mr. KIM Doo Hwan (Korea)** asked **Ms. ZHANG Yuan (China)** whether there are any notable difficulties of soil contamination management. Ms. ZHANG Yuan answered that as a large amount of untreated waste is transferred to the soil system in the industry production process, the emerging industries need to meet higher environmental requirements.
- 3) **Mr. QIU Yizheng (Japan)** asked **Mr. DING Nanhua (China)** whether there are any supports from the government for promotion of technology transfer, and promoting technology distribution under the “Belt and Road” Initiative. Mr. DING Nanhua answered that government plays a significant role in technical exchange and technology transfer.
- 4) **Ms. SUGO Naomi (Japan)** asked **Ms. CHOI Jina (Korea)** how the incentive policies play a role in building environmentally sustainable city from the public perspectives. Ms. CHOI Jina answered that if citizens reduced water and energy consumption, they would receive rewards in the form of different types of voucher.

SESSION 3: Public Awareness & Practices on Corporate Social Responsibility (CSR)

Mr. KIM Doo Hwan, Professor of SangMyung University (Korea), Chair of Session 3, started the session with an introduction of the topic and presenters for the session.

Mr. KOYAMA Katsuhiko, General Manager of Environmental Department, Daiwa House Industry Co., Ltd. (Japan), began his speech on “Efforts for a carbon-free society” with an introduction of company’s profile and its role in raising environmental awareness. He stated the long-term environmental vision challenge ZERO 2055. As a group that co-creates value for individuals, communities and lifestyles, Daiwa House Group contributes to the emergence of a sustainable society and it is addressing the challenges of zero

environmental impacts. The challenges include prevention of global warming, preservation of biodiversity, conservation of natural resources, and prevention of chemical pollution. For setting an example, Daiwa House Group established the long-term goal reflecting “2°C target”, doubled energy efficiency by applying zero-energy building (ZEB) to new facilities, promoting 100% renewable energy use, and building model demonstration of electrical self-sufficiency office. He then introduced a number of business activities to achieve carbon-free goal. The activities include development and dissemination of houses with self-sufficient energy supply systems, expansion of ZEB, integrated township development, and overseas business based on technologies with their experiences in Japan. Grace Residents in Suzhou (China) was used as an example. The presentation ended with introduction of activities initiated for co-creation of a brighter future which includes Daiwa Sakura Aid (Conservation of cherry blossoms) and environmental education for children (Hagu-eco)-Workshop of house models. He expressed his hopes that the company will continue to make best efforts for development of spiritually affluent lifestyle and society, keeping the corporate philosophy of co-creation of a brighter future.

Ms. BAO Xia, Secretary General of Suzhou Industrial Park Corporate Social Responsibility Alliance (SIP-CSRA) (China), delivered a speech on “Progress Sharing of CSR Standardized System Establishment”. She began the speech with an introduction of urban development of SIP. The development history of SIP CSR including 3 stages. The 1st stage (2010-2015) highlights CSR demonstration zone which re-defines CSR. The 2nd stage (2016-2017) upgraded goal of “CSR demonstration zone” to establish “Social responsibility ecosphere” which involves a variety of stakeholders including government, NGO, enterprise, supply chain community. The 3rd stage (2018 till now) aims to construct the sustainable development park in an innovative and collaborative manner in accordance with SDGs. She then introduced a few main measures and important achievements including establishment of assessment system, development of an online assessment system, engagement of enterprises to do assessment and capacity building trainings. CSR online assessment system

and its assessment results which aims to encourage enterprises to disclose the information regarding social responsibility were shown following the introduction of the building of SIP CSR standardized system. The presentation ended with a future outlook which highlights the organic combination of long-term goals and stage-based planning.

Ms. CHOI Jina, Team Manager of Korea Environmental Industry Association (Korea), presented on "CSR Practice Cases of Small and Medium Enterprises in Korea". She first gave a brief introduction of corporate social responsibility. The CSR characteristics of small and medium enterprises compared to large corporations were explained. Following the introduction of CSR support policy of SME, she shared the CSR cases of small and medium enterprises from paper and agricultural industry. These enterprises have a good CSR performance by making efforts to reduce energy and water consumption, and greenhouse gas emission. She ended the presentation with stating hope that government could provide more support for SME to encourage them having a better corporate social responsibility performance.

During discussion time, active discussion was made.

- 1) **Mr. JUNG Inha (Korea)** asked **Mr. KOYAMA Katsuhiko (Japan)** if there are any specific measures for houses to reduce greenhouse gas emission and improving energy efficiency. Mr. KOYAMA Katsuhiko answered that photovoltaic solar energy is applied for household energy saving.
- 2) **Mr. SHI Feng (China)** asked **Mr. KOYAMA Katsuhiko (Japan)** whether there are any actions taken by real estate industry for promoting green supply chain management. Mr. KOYAMA Katsuhiko answered that corporate social responsibility guidance is provided for suppliers. Performance of enterprises will be annually evaluated in accordance with the CSR guidance, thereby gradually establishing and improving the green supply chain management mechanism.
- 3) **Ms. MOON Yeong Hyeon (Korea)** asked **Mr. KOYAMA Katsuhiko (Japan)**

whether there are any preferential policies for the environmental-friendly buildings in Japan. He answered that the volume fraction will be acclaimed due to use of eco-friendly facilities.

SESSION 4: Environmental Labelling

Introduction of the session was made by the host, **Ms. LIU Ting, Section Chief of China-ASEAN Environmental Cooperation Center (China).**

Ms. ZHANG Xiaodan, General Manager of CEC (China), presented on “CJK Eco-label Cooperation”. She first gave an introduction of three broad types of voluntary labels which are identified by the International Organization for Standardization (ISO), which includes Type I Environmental labelling, Type II Self-declared environmental claims, and Type III Environmental declarations. After introducing the definition of “Eco-Label”, she gave a brief overview of the CJK Eco-label. Korea Environmental Industry and Technical Institute (KEITI), China Environmental United Certification Center, and Japan Environment Association (JEA) have agreed to harmonize eco-label criteria at the 5th Round Table Meeting (RTM). She then described the current state of Eco-Labelling in China, Japan and Korea, which includes the China Environmental Labelling (CEC), Eco Mark (JEA), and Korea Eco-Label (KEITI). Also, she briefly explained the CJK Common Criteria. As of now, CJK reached an agreement on common criteria items of “Shredder” and the CJK online platform is officially launched and used. The presentation ended with what CJK Eco-Label cooperation could provide for the enterprises. It saves the costs, reduces the process and provides a better understanding of mutual recognition. CJK Eco-Label cooperation will keep providing a green pathway for the trade of environmental friendly products.

An agreement was signed by **Ms. ZHANG Xiaodan, executive director of China Environmental United Certification Center (China), Mr. UNO Osamu, Secretary General of Ecomark office, Japan Environment Association**

(Japan), Ms. MOON Yeong Hyeon, assistant director of Ministry of Environment of Korea (Korea).

Commemorative photograph was taken during the signing event.

SESSION 5: Technical Exchanges and Cooperation on Water Pollution Prevention and Control

Mr. GOTO Toshihiko, CEO, Sustainability Forum Japan (Japan), Chair of Session 5, introduced the topic and the presenters of the session.

Mr. LU Yong, Deputy General Manager of Jiangsu Imedaka Environmental Technology Co., Ltd. (China), delivered a presentation on “Water toxicity automatic monitoring equipment”. He began the presentation with an introduction of existing condition of water pollution in Longjiang, Zhenjiang, Shanxi, and Yichang. Compared with the EU regulation, he analyzed the limitation of chemical monitoring in China which includes its complicated operation, high cost, incapability of coping with compound pollution and sudden pollution. The monitoring principle, features, and experimental data were described later after he introduced the oryzias latipes as the biomonitoring fish. He also highlighted the competitive advantages of Imedaka’s method in comparison to Luminescent bacteria method and other fish methods. The applications were introduced at the end of presentation.

Mr. LEE Keon Ho, CEO of Rothwell Water Co., Ltd. (Korea), presented on "Process Technology Portfolios on Wastewater Treatment Plant". He described the WWTP process transition in Korea. In the past 30 decades, the key process developed from 2nd treatment to biological nutrient removal and then to technology of MBR, U/F, R/O for reusing purpose. He also introduced the WWTP process portfolio of Rothwell such as PKG CSBR for small scale, CSBR for medium large scale, MCSBR for increased capacity and CMBR for reclamation. Rothwell will provide the ultimate solutions for wastewater

treatment following 5 principles: environmentally sustainable facility, easy operation but high treatment efficiency, lowest CAPEX and OPEX, easily extendable for the future increase, must have proven experiences in PPP projects economically. There are many outstanding cases including the World NO.1 Underground WWTP, patent process CSBR of "Anyang" City Korea, especially the Packaged Small CSBR used in China. Rothwell Water is performing project-engineering services of Feasibility study, key equipment supply and commissioning based on Wastewater Patent Process Technologies, which is an excellent global competitiveness company awarded by Korean GOV. Minister 2015 & KEITI 2014. In the end, Mr. LEE Keon Ho highlighted that Rothwell is ready to provide technology portfolios into China.

Mr. NAKAMURA Tomoya, NISHIHARA Environment Co., Ltd. (Japan), gave a presentation on "Recent action for environmental solution of Nishihara Environment". He briefly introduced the water purification technologies for lakes and reservoirs which is the water purification with Ultra High Speed Chemical Precipitation (ACTIFLO Process). After he explained the verification of ETV (Environmental Technology Verification) in Gaien Moats around The Imperial Palace, the basic information of Gaien Moats around the Imperial Palace were given. He also introduced the flow and features of the ACTIFLO process which includes its compact size, space-saving and cost-saving, adaptability for various fields of water purification, prompt and adjustable operation and the variety of solutions for different water volumes. After applying the ACTIFLO process, the impacts were explicitly listed which includes environmental purification, sewerage, and water supply. The demonstration target and change of the water quality in the Gaien Moats around the Imperial Palace were shown. Lastly, he then introduced a proposed project which aims to give citizens an opportunity to consider environment of lake shore and water quality conservation, through providing purified waters.

During discussion time, an active discussion was made.

- 1) **Mr. SUZUKI Yutaka (Japan)** asked **Mr. LEE Keon Ho (Korea)** how small-size treatment equipment deals with sewage and sludge. Mr. LEE Keon Ho answered that treatment option for sewage and sludge depends on its amount.
- 2) **Mr. SUZUKI Yutaka (Japan)** asked **Mr. LU Yong (China)** what kind of water quality parameters can be effectively detected with the equipment. Mr. LU Yong answered that the automatic monitoring equipment is not used for monitoring specific measurements of water quality, but only for quickly monitoring the toxicity in the water.
- 3) **Mr. JUNG Inha (Korea)** asked **Mr. NAKAMURA Tomoya (Japan)** what kind of agents required for wastewater treatment. Mr. NAKAMURA Tomoya answered that coagulant and flocculant with macro molecular are widely applied for water purification.
- 4) **Mr. LU Yong (China)** asked **Mr. LEE Keon Ho (Korea)** whether situation of sewage sludge treatment faces serious challenges in Korea. Mr. LEE Keon Ho answered that treatment options depend on the amount of the sludge and size of treatment plant.
- 5) **Mr. LU Yong (China)** also asked **Mr. NAKAMURA Tomoya (Japan)** the progress of cyanobacteria effective use in Japan. Mr. NAKAMURA Tomoya answered that he doesn't know such technologies applied, but after the application of ACTIFLO, the growth of cyanobacteria has not been remarkable.

SESSION 6: Practices on Prevention and Control of Motor Vehicle Pollution

Mr. KIM Doo Hwan, Professor of SangMyung University (Korea), Chair of Session 6, thanked all the delegates for their full participation. He expressed hopes for the presenters to share their experiences, and introduced the first presenter.

Mr. MAEKAWA Tomonori, Senior Manager of Osaka Prefectural Government (Japan), delivered a speech on “Environmental measures related to automobiles by Osaka Prefectural Government”. He started the presentation with an introduction of Osaka and the Automobile NOx/PM Act. He also introduced a few major automotive environmental measures to achieve targets under the Osaka Prefecture Plan which includes regulation on emissions from automobiles, dissemination of eco-friendly automobiles, promotion of eco-driving, adjustment and reduction of traffic demand, measures on traffic flow, and awareness raising and environmental education. He then gave a brief overview of regulation on emissions from automobiles including unit regulation on automobiles, vehicle type regulation, and inflow vehicle regulation. The details of vehicle inflow control for transport operators, shippers and travel operators, and facility managers were given respectively. He also explained the promotion of eco-friendly cars and eco-driving (which is defined as vehicle operation in consideration of reducing environmental impact). He ended the presentation by describing the achievement status of environmental quality standards and emission amount.

Mr. CHEN Qizhang, Chairman of Sinocat Environmental Technology Co., Ltd. (China), delivered a presentation on “Control of Automobile Exhaust, Defending the Blue Sky”. He gave a brief overview of company profile including its products, production capability, catalyst annual capacity, independent intellectual property, and its long-term commitment for the reduction of air pollution. He highlighted the R&D capabilities of the company. The company is making R&D investment to develop the core technology including catalyst material technology and building its own world-class vehicle test labs. He also introduced the production and quality control which includes raw material control, process control, and finished product control. Lastly, the case of diesel engine adding DPF and gasoline vehicle catalytic converter were mentioned as the examples to exemplify the retrofit projects vehicles and VOC.

Mr. CHOI Seung Ho, Team Manager of Korea Automobile Environmental Association (Korea), shared "Experiences of South Korea on Diesel Vehicle Retrofit Program" with us. KAEA contributes to the improvement of citizens' health and environmental conservation by reducing the pollutants from automotive exhaust gases as well as to promote the mutual benefits of members of the association, and the purpose of KAEA establishment is to comply with the Article NO. 78, 80 of the "Clean Air Conservation Act". There are four main businesses of KAEA: diesel vehicle retrofit program, eco driving culture spread program, EV changing infrastructure management, and research for environmental transportation field. With the data of high PM level among OECD countries, air pollution level is getting worse in Seoul. There are 70% of air pollutants in metropolitan area emitted by vehicles and the particulate matters effects human health. Diesel vehicle retrofit program is key to manage old diesel vehicles. He described the target of 2014 is to reduce PM $40\mu\text{g}/\text{m}^3$ and NO_2 22ppb. To implement emission reduction program since 2005, retrofit of old diesel vehicles are subsidizing installation of after treatment devices, conversion to LPG and early scrapping. Here is the result that total 869,000 vehicles '05-'14 were funded by KRW 2.5 trillion. To accomplish the 1st phase execution, PM₁₀ in Seoul is reduced from $60\mu\text{g}/\text{m}^3$ (2006) to $48\mu\text{g}/\text{m}^3$ (2016) and NO_2 decreased from 36ppb to 31ppb. Even the air quality of Seoul has improved, but is still higher than other main cities. In the future, the 2nd special measures of goal in 2024 are decreasing PM₁₀ $30\mu\text{g}/\text{m}^3$ and NO_2 21 ppb. The investment plan illustrates 4.5 trillion of total fund by 2024 and the retrofit program fund total 3.5 trillion. To sum up a conclusion, Mr. CHOI Seung Ho said air quality in Seoul has been improved since 2005 and 2nd phase program is running for further improvement; the DPF system should pass strict certification process set by MOE and its running performance is monitored by KAEA; 491,085 DPF systems, which are mainly hybrid type (burner or FBC), are installed and running from 2004 to 2017; the members of KAEA have accumulated sufficient technologies and experience on DPF system; we hope to contribute to improve air quality with our proven DPF systems.

During discussion time, an active discussion was made.

- 1) **Mr. MAEKAWA Tomonori (Japan)** asked **Mr. CHEN Qizhang (China)** whether it is compulsory to utilize Diesel Particulate Filter (DPF). Mr. CHEN Qizhang answered that utilizing DPF is not compulsory in law as of now, it is only an effective approach to reduce emissions.

- 2) **Mr. CHEN Qizhang (China)** asked **Mr. MAEKAWA Tomonori (Japan)** and **Mr. CHOI Seung Ho (Korea)** whether it is compulsory for motor vehicles meeting environmental standards. Mr. MAEKAWA Tomonori first answered that the standards for vehicles in use are not as strict as new vehicles. In case of Japan, for passing vehicle inspection, vehicle must be retrofitted in accordance with the standards of exhaust emission. Mr. CHOI Seung Ho answered that in case of Korea, catalyst of the vehicle should be changed if it did not reach the emission standard. **Mr. SHI Feng (China)** also shared that for defending the blue sky, Chinese government is initiating the action plan for exhaust emission control of diesel vehicle.

- 3) **Mr. CHOI Seung Ho (Korea)** asked **Mr. MAEKAWA Tomonori (Japan)** to explain the policies or measures applied for effective exhaust emission control. Mr. MAEKAWA Tomonori firstly answered that in case of Japan, new vehicles must strictly comply with the policies which regulate the exhaust emission and government promotes publics to replace with the new vehicle which could comply with the new exhaust standards. Mr. CHEN Qizhang answered that in case of China the incentive policies depend on the region.

- 4) **Mr. MAEKAWA Tomonori (Japan)** asked **Mr. CHOI Seung Ho (Korea)** whether the Diesel Vehicle Retrofit Program is only applied for Seoul or for the whole country. Mr. CHOI Seung Ho answered that the programme is gradually applied at a national scale.

5) **Mr. KIM Doo Hwan (Korea)** asked **Mr. MAEKAWA Tomonori (Japan)** what kind of incentive policies government initiated for prevention and control of motor vehicle pollution. Mr. MAEKAWA Tomonori (Japan) answered that central government provides subsidies and tax incentive for eco-friendly car and Osaka prefecture organizes events for raising public environmental awareness.

SESSION 7: Policies and Cooperation on Rural Environment Management

Mr. GOTO Toshihiko, CEO, Sustainability Forum Japan (Japan), Chair of Session 7, introduced the topic and the presenters of the session.

Mr. XIA Jinhua, Chairman of Suzhou Zhongkehuisheng Biotechnology Co., Ltd. (China), delivered a speech on “Current situations and analysis of China’s comprehensive management in rural environment”. He began by introducing the problems and causes of China’s rural environment. Industrial sources, animal husbandry sources, agricultural sources, and domestic sources are regarded as the four major pollution sources contributing to the deteriorated environment and pollution in water, soil and air. Three main causes were analyzed including seriously insufficient environmental protection infrastructure in rural areas, deficient environmental protection system and mechanism, and weak environmental surveillance ability in rural environment. He then emphasized the time significance of China’s comprehensive management in rural environment. He cited from President Xi Jinping and the reports of the 19th National Congress of the Communist Party of China to highlight that comprehensive management of rural environment is a phased achievement during the enforcement of rural revitalization strategy. Lastly, a case analysis of China’s comprehensive management in rural environment was given. “Three-year action plan on the management of rural living environment” specialized arrangement on the management practice in rural living

environment from 2018 to 2020. The target and actions of this plan were introduced.

Mr. JUNG Inha, Manager of Micromax agricultural association corporation (Korea), stated "Treatment of killed animals with disease using aerotropic thermophilic bacteria" to us. Micromax agricultural association corporation was established in 1996, and its' agricultural association corporation set up in 2010. Their business areas are agricultural environment, industrial environment, and new business area. There are many problems of current technology for treatment of killed animals with disease. The technology of killed animal treatment technology by aerotropic thermophilic microorganism is registered as 'Aerial influenza emergent act guideline' (Dec 2014) and 'Foot-and-Mouth disease emergent act guideline (Oct 2015) by Ministry of Agriculture, Food and Rural Affairs and 'Livestock burial site environment inspection guideline by Ministry of environment (Dec 2013). Fast for decomposition of fat, protein, carbohydrate and the like, no odor, the high temperature of ~ 70 °C, which occurs during the decomposition process, not only evaporates leachate but also kills animal pathogens. He introduced many kinds of Jayeonae and its usage such as Jayeonae for drinking water (silver color), fertilizer (red), feed (yellow).

Mr. OKAMOTO Atsushi, Manager of Environment Bureau, Environmental Policy Dept, Osaka City (Japan), gave a presentation on "Policy and cooperation for local environmental management - Efforts for *Symbiosis between nature and humans* by Osaka City". He started the presentation with an introduction of Osaka City and the significance of biodiversity conservation. The formulation of Osaka City Biodiversity Strategy was introduced. The strategy aims for achieving the vision towards 2050, city where residents feel the blessings of biodiversity. A variety of partnerships with citizens, environmental groups and companies were required to achieve this vision. He also introduced the efforts Osaka city made for biodiversity conservation which includes raising awareness of biodiversity by enjoying nature and living

creatures, learning and experiencing, conservation and creation of natural spaces, utilization of green infrastructure, and efforts on urban and global environmental issues. Collaborating with educational sector and building partnerships with volunteers, environmental groups and companies could effectively promote the biodiversity conservation. He ended the presentation with a statement hoping for promoting the biodiversity conservation through the Expo 2025.

During discussion time, active discussion was made.

Mr. NAKAMURA Tomoya (Japan) asked **Mr. JUNG Inha (Korea)** and **Mr. CHA Shang Wha (Korea)** if there are any measures to control the harmful effect of NH₃ to anaerobic digestion, and recommended business model for sale of compost products. Mr. JUNG Inha (Korea) answered that sewage sludge does not be incinerated but composted its by-products and are not used for sale, but distributing for farmers free of charge. Mr. CHA Shang Wha (Korea) mentioned that Micromax agricultural association corporation did not directly sell the compost by-products, instead, they provide equipment for factory to compost.

SUMMARY SESSION

All delegates actively participated in the review and discussion of meeting minutes.

Ms. SUGO Naomi, Deputy Director of Ministry of the Environment (Japan), first thanked all support from Chinese delegates to hold the 4th Tripartite Roundtable meeting. She then introduced the 5th TREB and expressed her hopes for further cooperation and participation from the three nations in next year's meeting.

Mr. SHI Feng, Deputy Director of China-ASEAN Environmental

Cooperation Center (China), summed up the results of this year's meeting and emphasized that China-ASEAN environmental cooperation center would like to establish the platform to facilitate exchange of information on relevant policies and technologies among the three nations. He also introduced "International Coalition for Green Development on the Belt and Road" and welcomes all stakeholders from the three nations to participate in this coalition. He then thanked all the delegates for preparing and participating in the 4th Tripartite Roundtable meeting.

Mr. GOTO Toshihiko, CEO, Sustainability Forum Japan (Japan), expressed his gratification to the new achievements of this year's meeting and agreed the importance of technological innovation in response to common environmental issues. Considering the similarity of culture and value among the three nations, he emphasized that we should seek common ground while reserving differences to promote the development of environmental industry among the three nations.

Mr. KIM Doo Hwan, Professor of SangMyung University (Korea), gave a closing address, thanking all the delegates for sharing their presentations on different topics and expressing his hopes that TREB meeting will promote tripartite cooperation and exchanges on environmental policies, technologies and best practices among the three nations in response to Northeast Asian environmental issues.

Mr. SHI Feng, Deputy Director of China-ASEAN Environmental Cooperation Center (China), delivered the closing remarks and expressed his sincere gratitude to cooperation and support from the three nations. He also delivered his hopes that Tripartite Roundtable as a great platform could help to establish deep friendship among the three nations.