Summary Report

Conference on China-EU Circular Economy & Resilient Cities (Haikou, Hainan province)

Fig.1 Opening speech session of the meeting in Haikou

Building resilient cities has becoming an emerging hot topic in the global community, during which area China and EU member states have made progress and pilot projects in recent decade. Resilient cities aim to improve adaptive capacity to cope with multiple risks and shocks from internal and external environment, such as building sponge city to improve urban resilience to water resource quality and efficiency, related disasters (Fig.2). Different with this emerging topic in recent decade, recycling economy has well developed and implemented with its theory, techniques and methods from policy making to business. The idea of recycling economy is to improve sustainability of

human economy with more resource efficiency and less wastes to the environment, which can be achieved by extended product lifetime, re-use, repair and recycling in design of production, consumption and retailing process (Fig.3). However, less concerns on co-benefits have been posed to this crosscutting issue between these two tracks.

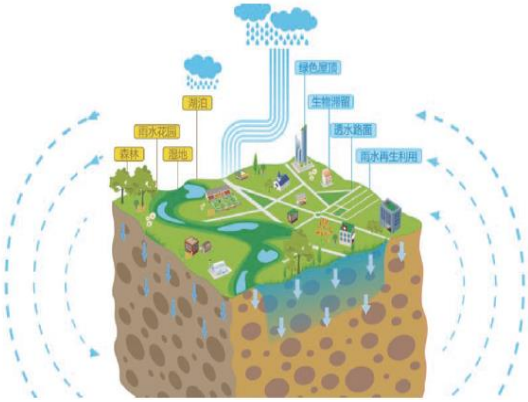

Fig.2 Resilient City(Sponge City)

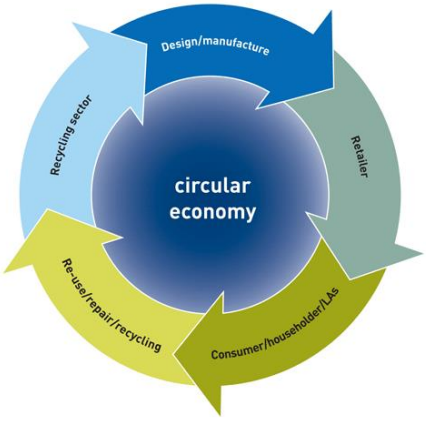

Fig.3 Circular Economy

EU-International Urban Cooperation Project is supported by the Global EU Programme (2017-2020), the EU IUC Programme is working in two main areas: 1) city to city cooperation on sustainable urban development, 2) support cities in Asia on climate change mitigation and adaptation. The IUC Asia team have coordinated a series of activities including several recent conferences so as to improve circular economy and green low-carbon development in China. As one of the major components of the IUC project, IUC Beijing team held the “EU-China Circular Economy and Resilient Cities Workshop” on Haikou, Hainan province on October 25th 2019. This conference aimed to discuss 1) how to improve urban resilience in society and business sector under the background of climate change. 2) how to integrate the policy and measures of building urban

resilience into recycling economy.

This conference comprised of three sub-sessions:

(1) Keynote speech: recycling economy, resilient cities and eco-civilization;

(2) Sector perspectives: experience sharing of building recycling economy and resilient cities in diverse sectors;

(3) Business cases and free discussions: Enterprises' effort in building recycling systems in Hainan; and co-benefits of integrating resilient cities into recycling economy.

I. OPENING SPEECH from IUC

Mr. Pablo Gandara, team Leader IUC ASIA IUC director, gave an opening speech, and present objectives and examples of pilot projects of IUC project, as well way forward of IUC in China. The IUC ASIA Programme is implemented by an experts' team based in Beijing and Jakarta including high-level urban development consultancies and city networks. Over 150 cities already involved into this programme, including 18 Chinese cities. Mr. Gandara introduced several pilot project examples to the Chinese participants. EU-China Smart-City Polit Zone in Liuzhou initiated by 22@ smart city district of Barcelona, Spain and EU-China Innovation Platform for offshore incubation initiated by Liuzhou and EU Pilot Cities (Granada, Rome, Barcelona) from China and EU. IUC also started a pilot project to build Cargo Railway Connection between Mannheim an Chongqing. Mr. Gandara encouraged Chinese partners in Hainan and other cities to explore matching areas and potential cooperation with EU pilot cities.

Furthermore, the deputy director, **Dr. Shi Xin** clarified the objectives of this

conference and expressed his willingness that this conference would offer good opportunity for Chinese participants to build bridge and connection between communities of climate change and recycling economy. Dr. Shi Xin said that one strengths of this conference is the diverse background of participants from academics, business and international organization, which would trigger off new topics and creative ideas among participants.

II. KEYNOTE SPEECH: recycling economy, resilient cities and eco-civilization

Mr. Raul Daussa, IUC Asia cluster manager of Circular Economy and Energy Transition, introduced EU circular economy and shared some good examples. The Action Plan 2019 and New Green Deal 2020 are two major policies to help stimulate Europe's transition towards a circular economy. In 2015, the European Commission adopted an ambitious The Action Plan 2019 on the Circular Economy[1], which includes measures to "close the loop" of the circular economy and tackle all phases in the life cycle of a product: from production and consumption to waste management and the market for secondary raw materials. The New European Green Deal in 2020 launched political guidelines for the next EU commissions during 2019 to 2024. This Action Plan aims to give a new boost to jobs, growth and investment and to develop a carbon neutral, resource-efficient and competitive economy. With the implementation of the Eco-design Working Plan 2016-201916, the Commission has further promoted the circular design of products, together with energy efficiency objectives. Mr.

[1] EU Action Plan for the Circular Economy, https://ec.europa.eu/commission/sites/beta-political/files/report_implementation_circular_economy_action_plan.pdf

Daussa shared several best cases at EU policy level, including Plastic Strategy, Waste Management, Eco-design Directive and Right to Repair. Mr. Daussa recommended some emerging and potential areas for China's participants to cooperate with IUC project, include: 1) Rome: construction and demolition waste and biogas from waste; 2) Manchester: policy planning for CE, 3D printing for plastics, Fuel Cell Innovation; 3) Denmark: EPR and deposit and return systems.

Professor Wang Songpei, an honored Academician of Chinese Academy of Social Sciences, a distinguished and pioneer expert in the area of ecological economy in China, made a keynote speech on strategy and practice of building ecological economy in Hainan. Professor Wang Songpei has more than 30 years research experience in ecological economy, he appreciated the special and valuable ecological resources in Hainan, as well the vision and efforts taken in Hainan to build an ecological economy province with appealing to the national strategy of ecological civilization in recent decade. As a governmental invited consultant for Hainan, professor Wang proposed CE as a major approach to ecological economy, he thought resilience means more sustainable in resource using and more flexible to change of situation. The essence of green economy is the harmony and synergy between ecology and economy, either can be overshot. Professor Wang Songpei shared his thinking on embedding recycling and resilience ideas and international practice into the ecological civilization in China. On the other hand, China has a long history of human-nature harmony philosophy and practices, such as traditional farming based and courtyard economy, which reflects well the circular economy. Professor Wang Songpei also introduced China's experiences of building no-waste city, Sunan economy mode, ecological design in human settlements, and so on.

Professor Zheng Yan, from Institute of Urban & Environmental Studies, CASS, presented her research on what is and how to build resilient cities. Sponge City and Climate-Resilient City pilot projects have been launched to build resilient cities in China. Sponge City pilot project designs to reduce rainstorm impacts and water resources related risk; meanwhile, Climate-Resilient City pilot project aims to deal with diverse disaster risks driven by climate change. Considering differentiated characteristics of geographic distribution, disaster types, and socio-economic development in Chinese cities, these Chinese pilot cities require theoretical and technical support to conduct activities of aiming to different disasters' resilience. However, the research and practice on resilience theory and methodology are still on the way in China and abroad. With two dimensions on heavy rain hazard and comprehensive adaptive capacity, professor Zheng categorized those pilot cities into four types at different resilience level: Resilient City (high resilience), Low Risk City (middle resilience), Vulnerable City and High Risk City (low resilience). About 33% of the total cases of pilot sponge cities range from resilient cities and low risk cities, On the contrary, 92% of the climate-resilient pilot cities attributed into the low resilience stage. Professor Zheng Yan indicated that the CE idea and technology should be embedded into these two pilot projects, since natural resources depletion would increase ecological disaster risk of urban development, exacerbate cascading effect during natural and environmental disasters such as water pollution, health risk, etc. In the end, professor Zheng proposed to strengthen collaborative governance between CE and low carbon cities, resilient cities in China, by the way of international experience learning such as from EU-China cases, launch demonstration project on this new crossing area, developing synergy planning between the in-charge agencies, and so on.

III. SECTOR PERSPECTIVES: experience sharing of building recycling economy and resilient cities in diverse sectors

Mr. Zhang Weijun , director of New Zealand (Shanghai) Eco-Water Environment and Technology Co., he has been working at the forefront of modern water management and application of information technologies in the recent 30 years. Mr. Zhang Weijun has been conducted many sponge city pilot projects for Shanghai, Chong Qing, Tianjin, Chengdu, Wuhan and many other environmental restoration projects in various cities. Taking water management, water recycling and disaster reduction in his cases of sponge cities, Mr. Zhang Weijun proposed three key components for successful water resilient sponge city planning: getting it right from the start, setting out clear guidelines and continuous enhancements during implementations. Which requires to manage two components: technical and management. , To achieve for a sustainable and livable city, some international experience can be learnt in building water resilient and recycling city, such as “Living with Water” in Holland, “Sustainable Urban Drainage” in the British, Low Impact Development in the USA, and “Livability Framework” in Singapore, etc. Mr. Zhang Weijun indicated that increasing water pressure in many cities in China has been noticed, which need a change of way of thinking, technology innovation in water purifying, recycling, and risk planning, as well as improving the policy formulation and knowledge sharing between urban managers and planners. Mr. Zhang Weijun also took Haikou as a good case to combine the two objectives of resilient city and recycling economy in Hainan province, since Hainan government has taken “Livable Haikou” as a strategy. Haikou has been selected as demonstration city

on pilot projects of “Ecological Restoration City”, “Urban Design” since 2007, with a good start to move on further to consider new challenges of climatic disasters like typhoon, flooding and logging, under a background of fast urbanization in the past decades.

Mr. Cheng Chunlong, expert from Shenzhou BioCNG (Hainan) New Energy Exploitation Ltd, Co., shared their “Turning Wastes into Energy+Fertilizer” mode in recycling organic wastes of urban and rural areas with Public-Private Partnership (PPP) (Fig.4). Mr. Cheng introduced Chengmai project on organic wastes disposal, the first demonstration project and good example in waste recycling in Hainan, has a total investment of 300 million RMB and will be finally built up in end of 2021. The project built a Center in Haikou for harmless treatment and resource utilization of urban and rural organic waste, which has served as an important platform for Haikou in harmless treatment of organic wastes from municipal agencies, agricultural and industrial production. The output of this platform is good quality gas and organic fertilizers. Till now, this project has a total waste disposal capacity of 1 million tons, with bio-gas of 35 million Nm3. This project has several advantages for experience sharing, such as scale effect in comprehensive waste treatment and resource utilizing, economic feasibility and replicable PPP mode, cost reduction in material collection, ecological design with international technology and management for urban landfills, and so on.

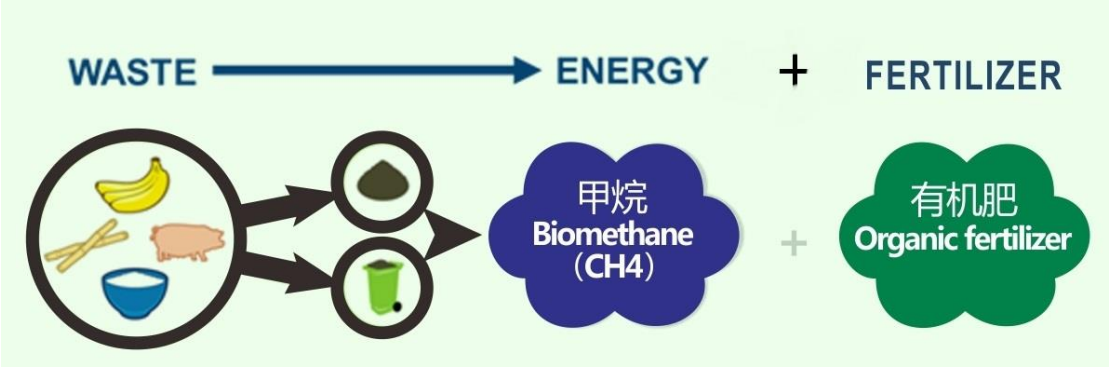

Fig. 4 “Turning Wastes into Energy+Fertilizer” Mode in Haikou

Mr. Bai Ping, general manager of the Beijing Incom Recycle, presented a case in reusable and recyclable in beverage plastic bottles with deposit system in Hainan. The “Circular Economy Promotion Law” enforced in January 2009 clearly stipulates that “to encourage the recycling of wastes by means of old for new and deposit”, Hainan government launched “Implementation plan for the prohibition of non-decomposable plastic products in production, sale and use in Hainan Province” in February 2019, which is the first regulation in plastic waste prevention and management at provincial level in China. As a complementary for this policy, Hainan government required plastic package to be reclaimed with introducing deposit system of international waste management. As a province with support industry of tourism and beverage industry, Hainan has a big volume of production and use for beverage plastic bottles. It’s investigated that the total potential production of plastic bottles in Hainan is about 1.6 billion, 40 thousand tons annually. The Smart Collection Deposit System for plastic wastes has an objective of 90% reclaiming rate, about a collection capacity of 36 thousand tons annually, with building 5000 reclamation facilities. This project is cooperated with Tomra company in Norway, supported by its smart deposit and collection machines. The policy implications

of this project are significant for Hainan's building a provincial level ecological economy, since this policy insisted "the producer pay" principle which can avoid the dilemma of "not in my backyard" effect with in situ treatment. This project also help curbing waste use and littering with advanced international techniques, create green jobs and tax benefits, improve public education in refuse classification, promote low carbon development in emission reduction, and so on. In near future, Hainan plans to build a provincial deposit system for plastic beverage bottle collection (Fig.5)

Fig. 5 Smart deposit system layout for beverage bottle collection in Hainan

Professor Shang Chunjing, is an expert in low carbon economy in Hainan University, presented her research on recycle economy development in Hainan's construction sector and shared cases of building green livable villages in Hainan. It has estimated that the construction section accounted for about 95% carbon emissions of the total life-cycle emissions during its up- and down-stream sectors. Hainan has seen a fast urbanization in the past decade since

its real estate industry for tourists, which really appeal to circular economy in construction sector in Hainan. Since 2015, Hainan has been offered national funding for Energy Saving and Circular Economy for a list of more than 30 units of CE demonstration in enterprises, industrial parks and other organizations. Which covers areas of hotel lightening, heating water system, residential wastes, chemical wastes, energy and medical wastes, and so on. In 2018, there has extra demonstration projects on energy saving technology, resource saving for commercial buildings. These pilot project on hotels would improve both circular economy and resilient city in Hainan.

IV: BUSINESS CASES & FREE DISCUSSIONS: Enterprises' effort in building recycling systems in Hainan; and co-benefits of integrating resilient cities into recycling economy

Chinese participants and IUC experts communicated with experience sharing about EU and China. There would be some co-benefits between circular economy, low carbon development and resilient cities. such as recycling technologies for plastic, green industry in agriculture, forests and farming, and transformation of production and way of life to a more resilient and sustainable one.

Mr. Daussa expressed his concerns on how this conference knowledge would contribute to the enterprises participants. Based on the presentations from the sectoral perspectives, he recommended some emerging and potential areas for China's participants to cooperate with IUC project. These cases include: 1) Rome: the Rome Cluster proposal on construction and demolition waste and

biogas from waste aims to advance know-how on secondary materials, turn buildings into smart circular product, decarbonise the building sector, strengthen the Urban Mining holistic approach, etc. 2) Manchester: embedding the Circular Economy into Greater Manchester's policy planning for CE, 3D printing for plastics, Fuel Cell Innovation can maximize resource efficiency in design & production to reduce, reuse and switch to sustainable alternative, moving to circular economy models; 3) Denmark: the Danish deposit and return system is one of the few areas in which producers and importers pay for packaging to be recycled. Dansk Return System operates the system and is a non-profit company with three sources of income: aluminium, glass and plastic from returned bottles and cans. About 10% of all bottles and cans sold are not returned. These unclaimed deposits contribute to operating the deposit and return system and making it more efficient. Mr. Daussa highlighted the potential cooperation of EU examples into Chinese cases, such as plastic package deposit system in Haikou, bio-fuel from organic wastes, recycling and low carbon technologies in construction and building sectors in cities of Hainan and other areas of China. Mr. Daussa also shared the IUC conference reports to be launched on the topic of integrating CE and resilient cities, he agreed that the value of urban resilience can be addressed into three major pillars of economy, society and environment. Among of which, the idea of resilience can highly improve the awareness and responsibility of the citizens to their living communities.

Chinese participants appreciated this conference as a good opportunity to acquire new knowledge in this crossing-cutting area, and it's impressive to share stories from diverse tracks and sectors. Those representatives of enterprises expressed their willingness to keep touch with IUC office and

experts, so as to build business connection to explore further potential cooperation in their areas, where there have emerging business opportunity in China, and international advanced technologies in environmental protection and recycling systems are highly appreciated. Professor Wang Songpei, Mr. Zhang Wenjun and professor Zheng Yan also expressed their interests and proposed several suggestions from perspective of policy making, include: 1) learning by doing through international communication; 2) drive investments on low carbon resilient pathway, by the way of integrating climate change targets into circular economy and ecological economy; 3) build interdisciplinary research innovation platform for academic community of natural scientists and social scientists by the way of IUC workshops and conferences; 4) consider integrated planning between in-charge agencies on policy making or/and implementing pilot cases of circular economy, green and low carbon cities, sponge cities, climate-resilient cities, smart cities, no-waste cities, etc. 5) explore successful market approaches like ppp, and improve public participation by scientific education, and so on.

Annex: Agenda of the Haikou Conference

时间	研讨主题	发言人/主持人
09:00 - 09:10	介绍会议目的及参会人员 Opening remark and introduction	IUC 主任 史欣博士

09:10 - 09:30	欧洲城市推动循环经济建设的政策经验 Recycling economy in EU cities	IUC 循环经济与能源专家 Raul Daussa
09:30 - 09:50	欧洲城市推动韧性城市建设的政策经验 Resilient Cities in EU	IUC 项目主任 Pablo Gandara
09:50 - 10:10	中国与新西兰建设海绵城市的典型案例与经验比较 Observation on the road to Sponge City in China	新西兰（上海）宜水环境科技有限公司总经理 章卫军先生 E-waters Environmental Science & Technology
10:10 - 10:30	中国建设韧性城市的政策与实践进展 Resilient Cities in China: policy and practice	中国社科院城市发展与环境研究所 郑艳研究员 IUE/CASS
10:30 - 10:50	Q&A 问题与讨论	全体 All participants
10:50 - 11:00	Tea break 茶 歇	

11:00 - 11:30	自由研讨：如何协同推进循环经济与韧性城市建设，发挥协同效益？--政府与企业界的视角 Free discussion: Co-benefits of integrating resilient cities into recycling economy—perspectives of government and private sectors	参会专家、 海口市地方部门 企业代表 Representatives from governmental agencies and enterprises in Haikou
11:30 - 11:40	闭会总结 Closing remarks	IUC 官员