

2019 SWITCH-Asia LEADERSHIP ACADEMY ON CIRCULAR ECONOMY

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Tsinghua University, Beijing, China



Full Report



In collaboration with



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List of Acronyms

SCP	Sustainable Consumption and Production
SWITCH-Asia RPAC	SWITCH-Asia Regional Policy Advocacy Component
UNEP	United Nations Environment Programme
SDG	Sustainable Development Goals
CE	Circular Economy
EEE	Electrical and Electronic Equipment
EU	The European Union
GEO	Global Environment Outlook
GEO-6	The Sixth Global Environment Outlook
HLG	High Level Intergovernmental and Stakeholder Advisory Group
LCA	Life Cycle Assessment
MEE	Ministry of Ecology and Environment of China
Tsinghua	Tsinghua University
BDA	Beijing Economic - Technological Development Area
GDP	Gross Domestic Product
EIP	Eco-Industrial Park
M&E	Monitoring and Evaluation

Background

SWITCH-Asia is a program funded by the European Union (EU) to promote sustainable consumption and production (SCP) across the Asian Region. The SWITCH-Asia Policy Advocacy Component (RPAC), implemented by the United Nations Environment Programme, is designed to strengthen the dialogue at regional, sub-regional and national policies on Sustainable Consumption and Production and thereby contributing to green growth and reduction of poverty in Asian countries.

Through the years of implementation by SWITCH Asia, different academies have been carried out by SWITCH Asia RPAC, raising awareness among young professionals from the public, private and civil society sectors on different topics related to SCP.

The academies were initially designed with the idea that “change is driven by individuals who can visualize a future they want to create”. In this context, the academies are deemed as a powerful tool to engage the region's youth population to change mindsets and inspire action towards a more sustainable consumption and production. These academies have also made efforts to create networks of junior professionals to promote South-South cooperation mechanisms in the field of SCP.

The academy in 2018 (the first academy of SWITCH Asia II) was carried out in Bangkok, focusing on circular economy (CE). Interest in the concept of circular economy has surged in recent years among policy makers and business actors, and is growing rapidly. Circular economy is the frontier of environmental, resource, and waste management, and has been recognized as a key element to promote SCP for countries in Asia. As a consumption and production powerhouse, the region has the potential to showcase the circular economy at scale.

On 2-6 December 2019, SWITCH-Asia RPAC organized its 2019 Leadership Academy on Circular Economy, in cooperation with School of Environment, Tsinghua University. On this occasion, 29 young participants representing the public and private sectors in 17 countries in North-East, South-East and South-East Asia met in Beijing, China, to discuss issues related to the circular economy and ways to move forward towards a more sustainable practice.

The 2019 SWITCH-Asia Circular Economy Academy for Asia was aimed to influence mindsets and inspire action towards a circular economy across young professionals of the region; to increase knowledge and understanding of circular economy by future decision-makers, to showcase circular economy policies and best practices, as well as to enhance a network of junior professionals across Asia in the field of circular economy and sustainable consumption and production.

To support learning in the circular economy, the academy emphasized interdisciplinary, project-based and participatory approaches. Before starting learning by modules, the Academy introduced the three key presentations on the main findings of the Global Environment Outlook (GEO), the overall situation of circular economy, and waste management in Asia in order to stress the

importance of working towards a more circular economy in Asia. The presentations were followed by seven modules covering policy, technology and application practices relevant to CE. A total of 14 professors, academics and experts committed to the research of circular economy delivered these key presentations and modules to participants on the concept of CE and how to translate CE as a solution to practice. Furthermore, cases studies from both Asia and the EU were used to illustrate the circular economy.

To learn about the results and impact of the Academy on participants, a pre and post evaluation was conducted (see annex II). A follow-up tool has been designed (see annex III) to evaluate how participants have used what they learned at the Academy. This questionnaire will be sent to the participants six months after the end of the Academy.

The report presents key messages from speakers and summaries opening session. Subsequently, the structure of this report is guided by the agenda of the five-day Academy, consisting of four key presentations, seven modules and presentations of Group Work. Each presentation/module with a specific topic relevant to circular economy summaries and main contents/points were made by the speakers. The Group Work session outlines the main proposals that were developed by the groups of participants at the Academy. The part of Conclusion and Evaluation Results are summaries from the result from pre and post evaluation according to the learning objectives. Suggestions proposed by the participants during the Academy, lessons learned and follow-ups are used as a reference for the academy and trainings in the future. The final part highlights the event visibility and its analyses.

Key Messages



Tu Ruihe

Head of China Office, United Nations Environment Programme (UNEP)

“Circularity and development of a zero waste economy are critical when working towards the achievement of SDG12”



Feng Mei

Project Manager, Cooperation Section, Delegation of the European Union to China

“a stronger and circular economy helps businesses and consumers as well as national and local authorities drive the transformation towards sustainability”



Jinhui LI

Professor, Tsinghua University / Executive Director, Basel Convention Regional Centre for Asia and the Pacific

“Circular economy is a very important tool for recycling and reutilizing waste, and also valuable for the development of economy and society.”



Deyi HOU

Associate Professor of Tsinghua University.

“To strive against the dilemma of resource depletion and environmental pollution, circular economy is regarded as the unique effective solution.”



Jo Miller

the Ellen MacArthur Foundation

“Circular economy is an economy which is restorative and regenerative by intention, and which decouples economic activity from material consumption”.



ZENG Xianlai

Associate Professor, School of Environment, Tsinghua University

The solution of circular economy practice will be Ctrl+Alt+Del to possibly solve your problem.



TAN Quanyin

Chief, General Management Branch

Circular economy is one of the fundamental approaches to address the environmental issues from industries in the Asia-Pacific region.



Jie Zhou

Senior Programme Officer, Ellen MacArthur Foundation

Design out waste is the key to circular economy. The reality is that most things today are still designed for linear model. This means that almost everything needs to be redesigned in accordance with the principles of the circular economy.



TIAN Jinping

Associate professor, School of Environment, Tsinghua University

Eco-industrial parks are intrinsically linked to circular economy in China.



ZHANG Lixiao

Professor, School of Environment, Beijing Normal University

Clean energy will definitely play an essential role in future circular economy development in China and worldwide as well, but we need know the potential challenges and proceed with caution.



Luz Fernandez

Programme Officer SWITCH Asia RPAC, UNEP

Financing partnerships are needed in order to promote Circular Economy.



ZHANG Lei

Associate professor, School of Environment and Natural Resources, Renmin University of China

It is impossible to talk about Circular Economy in general. Without differentiation and specification of the target groups and the social practices, conclusions on consumer traits can hardly support any effective policy making.



JING Hui

Communications Director, Energy Foundation (Beijing Office)

Connect the concept with the more tangible and immediate concerns of people's lives. Focus on here and now.



ZHENG Lixia

Project Coordinator for China, SWITCH-Asia Regional Policy Advocacy Component, UNEP China Office

Food and agriculture, housing and building construction, mobility and transport, as three broad areas responsible for the largest environmental and resource impacts (UNEP 2016), are the priorities for sustainability of lifestyle and behavior change.



Tunnie SRISAKULCHAIK

Programme Officer, SWITCH Asia, RPAC

Circular Economy is beyond waste management. It enhances well-being of society, economy and environment.

Opening Session and Key Presentations

The European Union (EU) Delegation to China, Tsinghua University and the United Nations Environment Programme (UNEP) officially opened 2019 SWITCH-Asia Leadership Academy on Circular Economy. The Academy was held on December 2-6, 2019, in Beijing, China. Ms. Feng Mei from the EU Delegation to China, reinforced the importance of SWITCH-Asia’s role in promoting “a stronger and circular economy, helping businesses and consumers, as well as national and local authorities drive the transformation towards sustainability”. Mr. Tu Ruihe from UNEP China office, emphasized the importance of the CE role in Asia and highlighted that “circularity and development of a zero-waste economy are critical when working towards the achievement of SDG12”.



Setting the Scene - Objective and Program Details of the Academy

The objective and main subject matters of the Academy were presented by Ms. Lixia ZHENG and Dr. Luz Fernandez, on behalf of SWITCH-Asia RPAC. The key messages include:

- **About SWITCH-Asia:** SCP aims to improve the overall environmental performance of products throughout their life cycle; stimulate demand for better products and production technologies and help consumers make informed choices. The European Union is committed to tackling these global challenges together with its partners in Asia and Central Asia. Launched in 2007, its SWITCH-Asia programme has achieved more than a decade of progress on SCP in 24 countries in the region.
- **About SWITCH-Asia RPAC:** From the objective of the Policy Advocacy Component, one of three components under SWITCH-Asia II, is to strengthen the dialogue at regional, sub-regional and national level on policies regarding SCP in selected countries from Asia, thereby contributing to green growth and reduction of poverty in Asian countries.
- **Introduction to the Academy:** During the week, the academy will learn and discuss ‘What is CE?’, why we need CE, and the policies and support needed to achieve CE. Other topics

include eco-design, technology and recycling towards CE, financing communication, behavior change, the indicator for CE and technical practices. The agenda outline and format (presentation, discussion, group project) of the academy were introduced to the participants on the first day (See the full agenda in Annex I).

Key Presentations –Why Are We Talking About CE?

Lecturers from Tsinghua University who participated in the GEO 6 discussion presented key messages of the report on the topics of energy, food and waste and circularity, including the relevance to circular economy. The discussion was followed by UNEP's briefing of the overall circular economy and waste management situation in Asia. Participants engaged in active discussions to better understand major ongoing issues in the region that could be solved through a circular economy approach. In the end, there was a general consensus that circular economy is fundamental to achieve sustainability objectives and the Agenda 2030.

I. Sixth Global Environment Outlook (GEO-6)

Speaker: Dr. Lei SHI, Professor, School of Environment, Tsinghua University

Duration: 0.5 hour

Main Contents

- Brief introduction to Global Environment Outlook (GEO): UNEP team worked closely with more than 160 experts and authors to produce the sixth Global Environment Outlook (GEO-6) published in March 2019. The findings are closely linked to pathways for achieving the Sustainable Development Goals as well as a 'Healthy Planet for Healthy People'.
- Drivers of Environmental Change include: 1) population: 9/10 billion people in 2050 will live in the developing world; 2) demographics: older people living in richer countries, while younger people living in poorer countries; 3) urbanization: 2/3 of the global population will live in cities, but 1/3 will live in the informal settlements and work in the informal economy; 4) economic development: SDGs has a commitment to end poverty by helping them transition into a more stable economic status, which will lead to an increased consumption; 5) technological change can have both positive and negative outcomes on the environment; 6) climate change: it is an environmental issue, but also a driver of environmental change.
- The development of GEO-6 has gone through five rounds of revisions at different stages of its development process. The 1.5°C targets in the Paris agreement require an 80% decrease in fossil fuel by 2050. However, confronted with challenges on energy, food waste and circularity, energy demand will increase by 50-60% by 2050. Under this circumstance, effective measures are energy efficiency practices through faster shift towards renewables, electric vehicle fleet, and alternative fuels.

- Confronted with serious challenges, systemic approaches should be adopted, such as building policy clusters or enabling policies that address systems, rather than issues that can create the momentum needed. Likewise, the environmental consequences of China has been showcased, illustrating its policy on typology from a life cycle perspective. This can be evident that, at times, integrating environmental, economic and social policies can be more powerful than environmental policies alone.

II. GEO-6 for Industry in Asia-Pacific Circular Economy

Speaker: Dr. Quanyin TAN, Assistant Professor, School of Environment, Tsinghua University

Duration: 0.5 hour

Main Contents

- Industrial sectors may have the highest potential of all sectors for energy end-use efficiency. Small-scale industries, however, is a unique sector requiring an out-of-the-box approach. Energy auditing is a key tool for delivering energy efficiency in industries, but more attention is needed to address hard-to-abate sectors. For example, the design of new industrial plants should incorporate efficiency standards, such as the reusing of waste heat which is often a missed opportunity.
- For industry sectors that are harder to abate, seven innovation areas were shown to participants. There are seven identified areas of innovation that have the potential to fully decarbonize on the harder-to-abate sectors of the economy that were discussed, including climate and energy efficiency, air pollution, water scarcity, water quality, biodiversity, industries, new pollutants from industries, electronic waste, microplastics, nanomaterials, pharmaceuticals, and personal care products. A more circular economy can reduce up to 40% in emissions among the harder-to-abate sectors in the industries by 2050. Towards a Multi-Benefit and Multi-Source Strategy, emerging industries can help control and reduce waste burning through improved waste management, as expected by governments that have outlined work solutions into their air pollution strategies. Likewise, among these environmental issues, water scarcity and water quality, as well as biodiversity and industries are also of crucial factors for industrial challenges.
- Rapid industrialization and population growth in Asia and the Pacific have led to increased consumption of electrical and electronic equipment (EEE), making the EEE life shorter. Resource recovery provides an incentive for effective recycling of WEEE. While macro-plastics receive the most attention due to the high rate of death among marine mammals, micro-plastics have also emerged as another serious concern. With the recent discovery of its detrimental effects, micro-plastics were found to absorb toxic chemicals that are harmful to marine wildlife. As industrial production systems made transitions in advanced countries that range from the archaic steam engines to belt-and-pulley systems, to robots, and well into artificial intelligence

and block chain technologies, there are many opportunities to mitigate the industries' impact on the environment. Governments and industries must work together to come up with sustainable solutions to the emerging environmental problems in the region.

III. Circular Economy and Waste Management

Speaker: Mr. Mushtaq Ahmed MEMON, SWITCH-Asia RPAC, UNEP Asia and the Pacific Office

Main Contents

- Overview SDGs: Responsible Consumption and Production & Waste Management is greatly important to achieve SDG12 and serve as the fundamental objective for circular economy.
- There have been many alarming cases and incidents happening in Asia. For example, a projected rise of 3°C or more in global temperature by the end of the century, due to the doubling of GHG Emissions by 2050 (Business As Usual) and heavy waste generation.
- Activities being conducted by UNEP have supported the waste data collection. Data points, waste generation point, collection point, transfer station point, and final disposal point, can generate diverse solutions, especially in countries with informal sectors or countries where high-valued waste output is directly sold for reuse and recycling.
- Food loss and waste have been another substantial problem. UNEP focuses on upstream to reduce food waste, and downstream to convert food waste into resource to close the loop. As for plastic waste, UNEP also focused on the upstream process to reduce plastic waste and downstream to convert these waste into resources that can effectively close the loop.
- The means for this solution is by decoupling through circular economy. The output of CE in Asia has been significant, where many Asian countries have benefited from this. UNEP offers its support for the transition towards CE through toolkits, training and other activities.

Module 1: The Concept of Circular Economy

The module 1 on the concept of Circular Economy, presented by Ellen MacArthur Foundation, explores the origin and details of the circular economy concept to help participants understand its history and nuances.

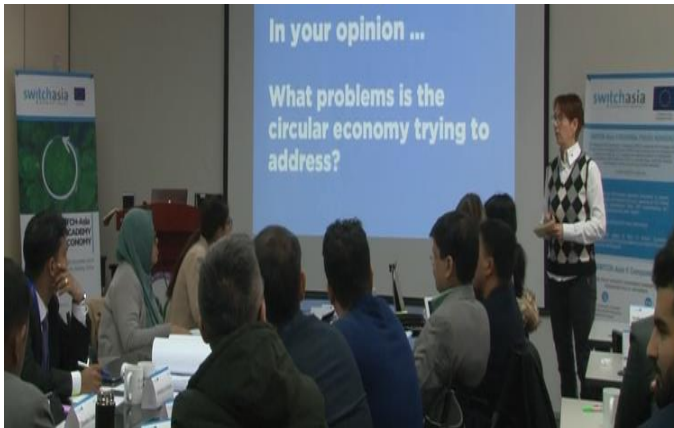
Speaker:

Ms. Jo Miller, Consultant on circular economy learning

Ms. Jie Zhou, Senior Programme Officer, Ellen MacArthur Foundation

Duration: 2 hours

Module introduction: This module examines the origin and details of the circular economy to understand its history, its nuances, and learn about the three principles that are fundamental to the notion of circular economy. Through the shift from the current, linear economy, this discussion also explores the foreseeable benefits on businesses, society and the environment.



Main Contents

- Definition of circular economy: an economy which is restorative and regenerative by intention and decouples economic activities from material consumption of finite resources.
- Development of circular economy: In 2010, there were 300 references, among of which 9 million references can be found on Google academic search (2013 WEF Meta-Council on CE; 2015 EU package on CE; 2017 World CE Forum in Helsinki, Growing Mountain of Academic Papers).
- Challenges of circular economy are varied, complex and interrelated. The reasons for such problems are that prices go down while efficiency increases.
- Solution: the four essential building blocks of a circular economy are identified; circular economy design, new business models, reverse cycles, and enablers of favorable system conditions.

Module 2: Policies of Circular Economy

A Case Study of E-waste Policy Development in China

For the module 2 on Policies of Circular Economy, the role of policies and regulation, Tsinghua University presented a case study of e-waste legislation development in China. Policy practices and features on Circular Economy in different cities in Europe and Asia were also shared during the session, where participants learned about urban policymakers and their roles in providing conduciveness towards circular economy in cities to create a thriving, liveable, resilient world, in order to achieve circular economy.

Speaker: Dr. Xianlai ZENG, Associate Professor, School of Environment, Tsinghua University

Duration: 2.5 hours



Module brief introduction : This module is designed to learn about roles of policies and regulations for circular economy, as well as how to develop policies through a case study analysis of e-waste recycling policies in China.

Main Contents

- Regarding policies and needs, approximately 10% of emitted substances are released into the environment, while 90% of resources have been reduced to solid waste. Through the rapid upgrading of products and increased diversification from 1990-2019, e-waste has become the fastest accumulating waste, globally, at approximately 50 million metric tons per year.
- What urban policymakers can do is provide a conducive environment for circular economy in cities to create a thriving and resilient world. Important methods to improve recycling rate is the collection process, with measures to handle the recycling rate through technological efficiency, such as the Chinese WEEE legislation system, catalogue, planning, permits, information systems, and funding systems that are emerging.
- China is not only the largest producer and consumer of electronics, but also the most polluted from illegal e-waste imports and informal recycling. Before 2000, the majority of e-waste in China was processed in the backyards or small workshops using manual disassembly and open burning. The techniques used in recycling of e-waste are often primitive, without the appropriate facilities to safeguard the environment or human health. About 109 licensed and certified enterprises across the country had been authorized to receive the subsidies, creating a capacity to process 150 million units of WEEE annually. Meanwhile, the formal recycling rate increased from 5% in 2006 to 35% in 2014 (by weight), which was higher than the average of EU.
- The most effective regulatory core in China, in contrast to the regulations in developed countries, is the 'old-for-new' policy and the WEEE 'producer-pays' funding. Environmental maintenance and management costs have been internalized to significantly change the e-

waste flow and deter the economic incentives that historically drove the informal recycling sector. China needed to develop its own approach to recycling WEEE, and it would not have been feasible to try to duplicate other countries' experiences or processes. An effective and practical management system has been well established, including permitting, reporting, auditing, inspection, information systems, and funding systems.

- Risk and challenges to proposed solutions: The imbalance between fund levies and subsidies may lead to an unsustainable WEEE funding policy. Tedious procedures related to auditing the operations and dispersing the subsidies have decreased the efficiency of the payment system. The e-waste recycling industry has grown so rapidly that neither domestic nor foreign processing technologies have been fully transferred or utilized. Eco-design is not widely practiced by Chinese EEE producers. Only a few of the large EEE producers participate in e-waste recycling in China. The new catalogue, which adds nine new categories of e-waste to regulation requirements, puts enormous pressure on some stakeholders.
- Although 66% of the world's population is covered by e-waste legislation, more efforts must be made to enforce, implement, and encourage more countries to develop e-waste policies. Most developed countries would require technologies innovation and facilities expansion of e-waste recycling. Most developing countries would need to improve legislation and strengthen collection channels. Small countries or regions would need to explore mobile plant, while some countries with little e-waste generation may opt for synergic recycling.

Policies of Circular Economy in Cities

Speaker:

Ms. Miranda Schnitger, Government Lead, Ellen MacArthur Foundation

Mr. Lukasz Holec, China Programme Lead, Ellen MacArthur Foundation



Duration: 3 hours

Module Brief Introduction: This module learns what urban policymakers can do to provide an enabling condition for circular economy in cities to create a thriving, liveable, resilient world, in order to achieve circular economy.

Main Contents

- The circular economy offers business leaders and governments a clear opportunity for long-term growth that is less dependent on cheap materials and energy, and which can restore and regenerate natural capital.
- A transition towards the circular economy can bring about the lasting benefits of a more

innovative, resilient and productive economy. Modelling conducted in this study suggests that it could lead, in Denmark, to 0.8–1.4% additional GDP growth, the creation of 7,000–13,000 job equivalents, 3–7% reduction in carbon footprint, and 5–50% reduction in virgin resource consumption for selected materials.

- This module provides an actionable toolkit for policymakers who wish to embark on a circular economy transformation.



Module 3: Innovation and business models

In the module 3 on Innovation and Business models, the participants learned about design and innovation as key for the circular economy with a lot of case studies in Europe, through a series of group exercises moderated by Ellen MacArthur Foundation.

Speakers:

Ms. Jie ZHOU, Senior Programme Officer, Ellen MacArthur Foundation

Ms. Jo Miller, Consultant on circular economy learning

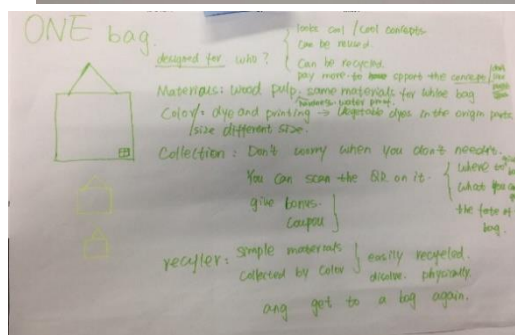
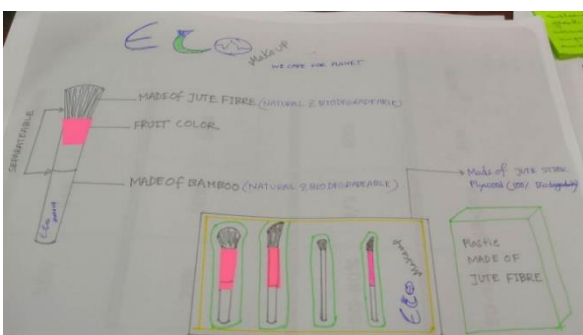
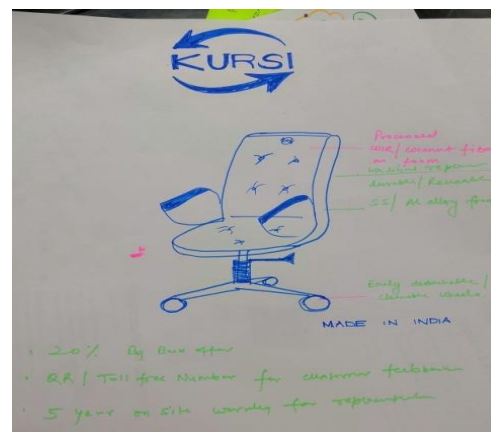
Duration: 3.5 hours

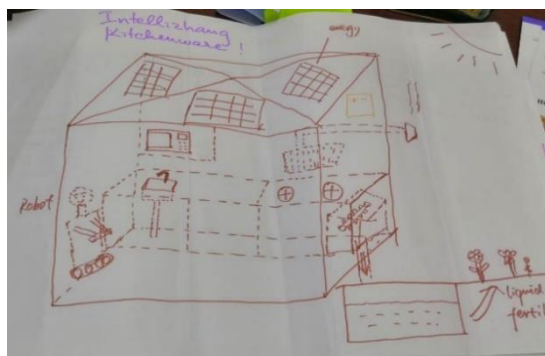
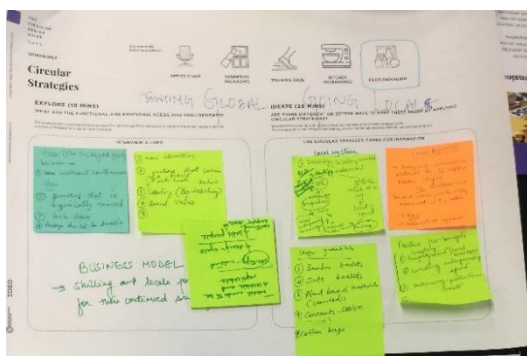
Module brief introduction: This module is devoted to learning about design and innovation for the circular economy. The scale of what we're designing has shifted from products, to companies, to economic systems. The design thinking approach allows people to explore new ways to create sustainable, resilient, long-lasting value in the circular economy.



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- Design and Innovation is key for circular economy. The scale of what we're designing has shifted from products to companies and to economic systems.
- The methodology and tools support manufacturers in transitioning to closed-loop products that are designed for multiple life cycles. This module can help guide company and government decisions by illustrating the benefit of products designed in this way, highlighting economic impact, resource efficiency, greenhouse gas emissions, and energy use.
- Industrial pilots have been conducted to test and develop tools. The evidence gathered strongly suggests that circular business models should be employed in the early stages of a company's product development process, and manufacturers can use the above methodology and tools to make this happen in practice.
- Group works: to design one product by circular strategies through describing the ideas and explaining what makes it more circular and what systems need to be in place.





Module 4: Technology and Business Models

Ecological Industrial Development towards a Greener Vision

The module 4 on Technology and Business Models, moderated by Tsinghua University, covered basic knowledge on industrial ecology and Eco-Industrial Park (EIP) and industrial symbiosis. Participants learned the procedure for EIP, planning, implementation and nomination in China, and how to apply this procedure to their respective countries. Cases on clean energy development practices, including biomass energy and wind power in China with regard to resource endowment, development strategy as well as policy incentives were examined and discussed in this module.

Speaker: Dr. Jinping TIAN, Associate professor, School of Environment, Tsinghua University

Duration: 3 hours

Module brief introduction:

This module covers concepts and basic knowledge on industrial ecology, EIP and industrial symbiosis, as well as the innovation of the global EIP development. The overview of industrial parks development in China was selected as a case study for this session.



Main Contents

- This module is to introduce the concepts and basic knowledge on industrial ecology, eco-industrial parks and industrial symbiosis. The innovation of a global eco-industrial park development as well as industrial parks development in China were examined.
- In terms of China's National Demonstration EIP Program, there are several distinctive characteristics.
 - First, since the proclamation of China's first National Trial EIP in 2001, the program has been growing and accelerating in new members. The number of accredited national

demonstration EIPs has continued to increase and the thresholds for enrolling in the program have become more and more stringent.

- Second, the leadership for the program had expanded from a single environmental regulator; SEPA toward a joint leadership by the Ministries of Environmental Protection, Commerce, and Science and Technology. The institutional cooperation is evident recognition of the needs for a better inter-ministerial coordination and mainstreaming of EIP work into the overall development of industrial parks in China. This inter-ministerial collaboration has greatly enhanced the interdepartmental cooperation.
- Third, China has hundreds of skilled researchers and professionals working in the field of EIP planning and consultancy.
- The eco-industrial development covers vast areas of topics, and broad-based knowledge is needed, while the facilitation of EIP also involves different stakeholders. The 3-hour in-class talk is somewhat limited to have the audience understand the concepts and policies clearly in the said timeframe. I learned that the audience are mainly young professional officials, and they need both basic knowledge and lessons learned from real practice. Thus, the in-class discussion with real industrial park managers and in-depth on-site learning will be very useful for the audience.

Clean Production and Recycling Technology

Speaker: Dr. Lixiao ZHANG, Professor, School of Environment, Beijing Normal University

Duration: 3.5 hours

Module brief introduction :

This module addresses clean production and recycling technology for circular economy and provides cases of clean energy development practices in China with regard to resource endowment, development strategy, as well as policy incentives. The promises and problems that we currently face will be illustrated, with biomass energy and wind power as cases.

Main Contents

- This module is to introduce the basic development of the world industry and address the reasons why clean production and recycling technology are vital for circular economy. Clean energy development practices in China with regards to resource endowment, development strategy and policy incentives are showcased.
- The problems that we face with biomass energy and wind power as cases are analyzed. The coal-dominated energy structure has not only fueled China's rapid economic development, but



also imposed great pressure on China. Promoting energy transition is among the great challenges for China.

- Take Beijing as a specified case in clean energy consumption: As one of the most developed megacities in China, Beijing's energy transition has gone through four typical stages. After a parallel growth between the economy and coal-dominated energy consumption at the beginning, the growth rate of energy consumption has gradually slowed down since 1996. Between 2000 and 2007, the energy structure became relatively balanced and diversified. Thereafter, economic development was seriously decoupled from direct energy consumption, and the de-coal trend had made remarkable achievements. Diversified energy structure based on the de-coal trend, cleaner energy, and economic restructuring promotes energy transition.
- Wind power, as a clean, renewable and low environmental impact technology, is part of the circular economy solution, understood as the circular flow of resource-product-recycled resources aimed at reducing both the use of raw materials and waste generation. China has sufficient wind resources. This resource availability will become more optimistic as technical innovations in wind turbines are capable in harvesting energy in lower speed wind flows.
- Renewable energy will play an essential role in reshaping the energy mix of China as well as the world, but we need to proceed with caution. China's wind power industry has experienced a rapid development, characterized by an accelerated increase in the installed capacity and enlargements in wind turbine sizes.

Module 5: Innovative Financial Instruments for CE

In the module 5 on Innovative Financial Instruments for CE, UNEP discussed with the participants on the different innovative finance concepts. Leading examples were presented, such as the Switchers Fund, an initiative developed by SWITCH-med that provides and facilitates direct funding and business support services to existing and future green, circular and social entrepreneurs in the Mediterranean Region. The participants learned that financing partnerships are needed in order to promote circular economy.

Speaker: Ms. Luz Fernandez, Programme Officer, SWITCH Asia RPAC, UNEP

Duration: 2 hours

Module brief introduction:

All investments have consequences, affecting individuals, whole communities as well as the economy. In addition to generating financial returns, investments can create jobs and thus have positive impact on society and the environment. Multiple forms of capital are needed to finance circular business models. This module addresses key



innovative finance concepts and explores which of the existing instruments are more relevant to financing business models of circular economy in Asia.

Main Contents

- Main challenges of finance for circular economy business models: lack of regulations or frameworks; lack of financial capability and access to support services for SMEs; lack of CE/SCP awareness among financial institutions; lack of guarantees or high interest rates; and applying for finance is a long and difficult procedure.
- Circular Economy is an opportunity for investors. Approximately €320 billion of circular investments in Europe is expected by 2025. Key CE investment themes in Asia are Industrial Resource Efficiency, Sustainable Agriculture, Waste & Water Management, Green Vehicles, Green Buildings, and Renewable energy.
- Types of financial instruments are debt, equity, Mezzanine financing, guarantees, reimbursable grants / contingent recovery grants, venture capital, and Green bonds.
- Banks (development and private) are the institutions that are most willing to finance investments in SCP/CE in SMEs. But often, these are initiatives that arise from a cooperation between different types of actors, both private and public, as well as cooperative agencies and entities of the non-governmental sectors.
- To be acceptable to a financial institution or private investors for financing, a project can become “bankable” when it has sufficient collateral, future cash flow, and high probability of success. Project bankability is therefore a broad concept that refers to all project dimensions and consider all project risk and benefits.
- Examples of new products developed to support CE or SCP: i) Investment fund for circular Economy (BlackRock); ii) Triodos Investment Manager (they have included CE as one of the key topics they finance; iii) ABN-AMRO (Goal by 2020 finance 1 billion euros in circular assets); iv) the Switchers Fund.

Module 6: Behavioral Change and Communication

In the module 6 on Behavioral Change and Communication, the guidelines related to behavior change developed by SWITCH-Asia I were shared with the participants. The session discussed on how to connect the concept of CE with a more tangible and immediate concerns of peoples’ lives, as well as the do’s and don’ts when communicating about circular economy.

Speaker:

Ms. JING Hui, Communications Director, Energy Foundation (Beijing Office)



Ms. ZHENG Lixia, Project Coordinator for China Office, SWITCH-Asia RPAC

Dr. ZHANG Lei, Associate professor, School of Environment and Natural Resources, Renmin University of China

Report Duration: 3 hours

Module brief introduction: Transitioning towards a circular economy requires a shift towards more sustainable lifestyle and behavior change. This module illustrates how policy making can support sustainable consumption choices, introduce basic social principles to create behavior change, and cases on existing policy framework at national and city levels. Through various case studies, the session outlines the communication strategy to promote behavior change towards sustainability.



Main Contents

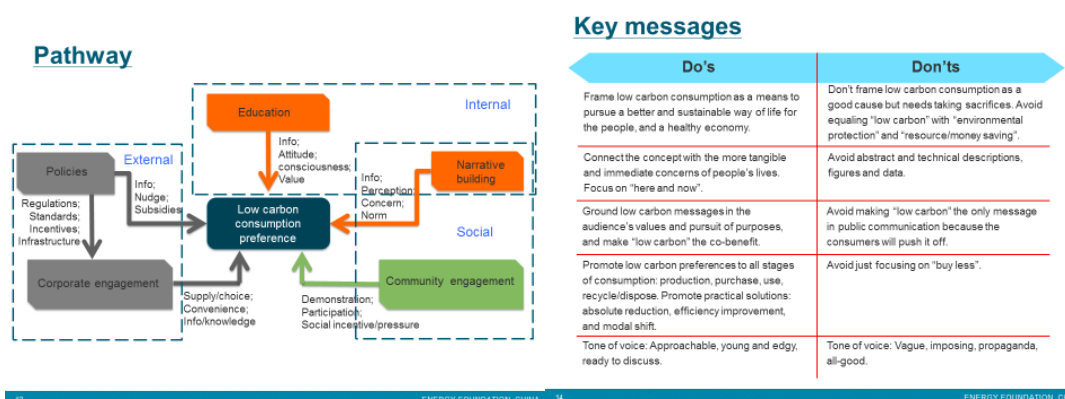
Guidelines for Sustainable Consumption and Lifestyle – Behavior Change

- A “sustainable lifestyle” is a cluster of habits and patterns of behavior embedded in a society and facilitated by institutions, norms and infrastructures that frame individual choice, in order to minimize the use of natural resources and waste output, while supporting fairness and prosperity for all. They shape our choices, our identities, our relationships, our health – and our impact on the environment.
- Determinants are super-factors that determine the possibility of particular lifestyles or consumer action. There are three categories: attitudes, facilitators and infrastructure. Cultural, political, economic, historical, geographic, physical, social and environmental are external factors which provide policymakers and businesses with many opportunities to support, facilitate and promote more sustainable lifestyles.
- Methodology to prioritize; a range of studies have identified three broad areas of economic activity responsible for the largest environmental and resource impact. Based on this, we can identify five lifestyle domains that are priorities for sustainability. Water, energy and waste are cross-cutting elements that affect and are affected by almost every lifestyle domain.
- Policy approaches towards a more sustainable consumption could include: 1) integrate sustainable consumption into high-level policies; provide training to government officials and

businesses; 2) establish a coordinating body on sustainable consumption; 3) actively involve stakeholders; 4) improve public information outreach; 5) kick start demand through sustainable government procurement, as well as more detailed approaches on economic measures.

Promoting Low Carbon Consumption Behaviour via Communication – Cases in China

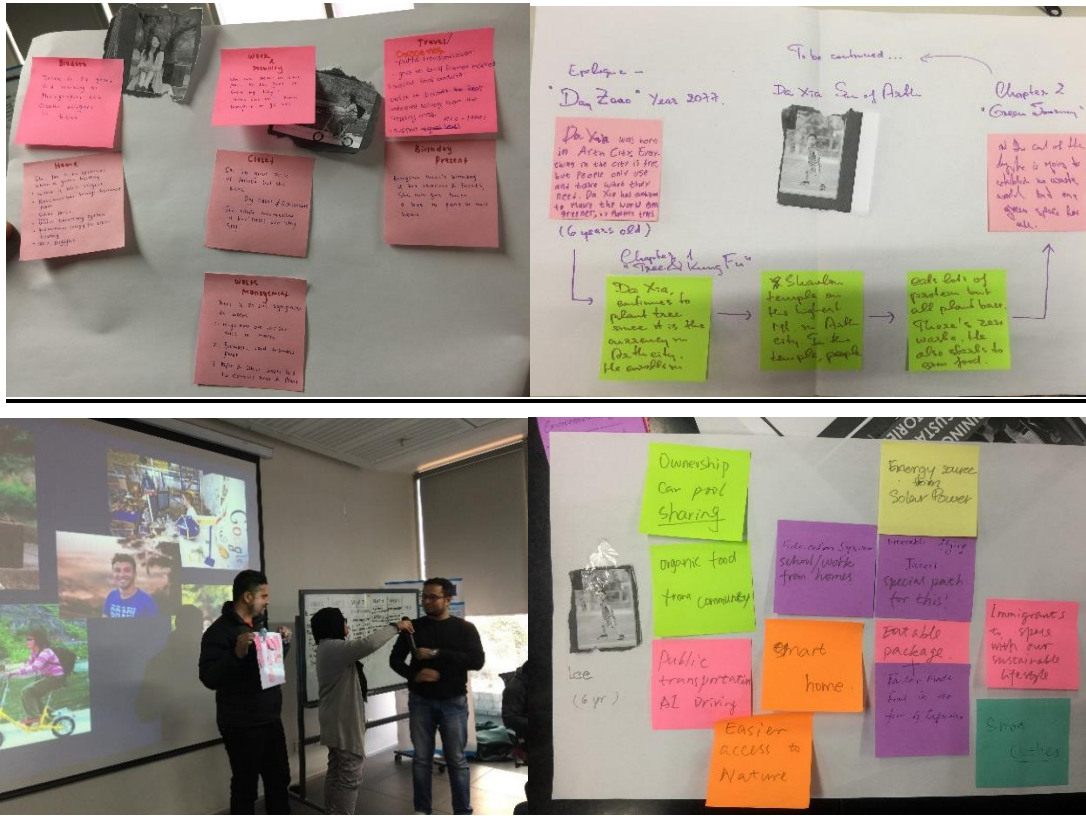
- The consumption situation in China: by 2019, 460 million Chinese people have moved to cities and adapted to new lifestyles, and dispensable income in 2018 averaged at USD 4,032 per person. Beijing and Shanghai have more than doubled the figure. China’s Engel’s Coefficient reached a historic low at 28.4% in 2018. In the first quarter of 2019, final consumption expenditure contributed 65% to China’s economic development.
- China faces challenges in its policies and markets. There is a lack of policy, infrastructure, and incentives to make the transition. However, policies to facilitate China’s green transition are much stronger on the production side than the consumption side. State agendas on green consumption is yet to be translated into systematic, incentivizing and bounding policies, while private sectors would need a foreseeable incentive to make the necessary changes.
- Key messages towards behavior change through communication are shown in the pictures.



Research and Practices for Transitions towards Sustainable Consumption

- Many challenges exist for studies on sustainable consumption that mainly include the lack of integrated research framework, too much debate on controversial issues, the tendency to be fragmented, scale or unit does not match in different studies, insufficient research methods and innovation, and the lack of support needed to formulate science-based policies.
- Achieving the Paris Agreement requires an overall curb of consumption and production. This is because consumption and production levels are the primary determinants of GHG-emission levels. The investments needed for infrastructure and capacity building in the coming decades will also leave little room for consumptive emissions. To improve the standards of living among the poor, it will require increased energy consumption and materials, along with a global rebalancing of consumption opportunities.

- In practice, it is impossible to talk about sustainable consumption in general. Without differentiation and specification of the target groups and social practices, broad conclusions on consumer traits can hardly support any effective policy making.
- Group Work: sustainable life stories – a group exercise to create sustainable living timeline with a created persona from the future.



Module 7: Indicators for Circular Economy Performance

In the module 7 on Indicators for Circular Economy Performance, participants were presented an indicator system that could be used for measuring circular economy performance.

Speaker: Dr. Xianlai ZENG, Associate Professor, School of Environment, Tsinghua University.

Duration: 1.5 hours

Module brief introduction: This module reviews the indicator systems that measure circular economy performance, zero-waste city indicator and the performance in China through a shared case study.

Main Contents



- The basic concept of a circular economy depicts a production and consumption system that relies on the recycling, re-use, repair, remanufacturing, sharing of products, changing the consumption patterns and new business models and systems.
- There is no specific indicator that can be a single measurement for the Circular Economy. However, a number of existing indicators can help measure performances in several areas that directly or indirectly contribute to the Circular Economy development. For instance, indicators on material flows are particularly relevant.

- Resource efficiency

$$\text{Resource efficiency} = \frac{\text{Economic benefit}}{\text{Material input}}$$

- Waste recycling rate

$$\text{Recycling rate} = \frac{\text{Waste recycling}}{\text{Waste generation}} \times 100\%$$

- As for resource efficiency indicators in Europe, the domestic material consumption by major material groups and recycling rate of end-of-life vehicle in China are introduced as cases on indicators of CE.

Technical Visit

The field visit of the Academy was to the Beijing Economic - Technological Development Area (BDA), one of 16 pilot cities/districts on zero-waste in China selected by Ministry of Ecology and Environment of China in 2019, with aims to form the models on minimization of waste and circular economy at city level that other cities can follow. The visit, guided by Tsinghua and BDA staff, mainly focused on the interpretation of the background, development, particularly for industrial development and structure. After the visit, the implementation plan and practices of BDA as a pilot district on zero-waste development were outlined to participants through presentations by BDA staff.

BDA, established in 1994, is a specific eco-industrial park which was well-designed and operated based on eco-industrial principle. BDA is targeted to be a scientific and technological innovation center, which covers an area of 64 km². The space boasts the lowest level of energy and water consumption among its Chinese counterparts, on par with the standards in developed countries. Its economic growth leads other state-level development zones in terms of quality and efficiency. Aside from its unique location and fast industry development, BDA is featured by its own special development model that focuses low-carbon energy conservation, circular economy and ecological livability through air quality, energy conservation, waste recycling and water reuse with indicators system. It has also completed an array of major ecological projects like the Corporate Culture Park, Boda Park, and Riverside Forest Park which covers hundreds of hectares, realizing a total forest coverage of over 40%.



Group Work

Group work is a method of instruction that gets students to work together in groups. In order to gain a quick knowledge during the academy, all participants were divided into working groups and asked to propose a CE solution for a problem linked to SCP in their selected country. In developing the solutions, participants must use the knowledge learned during the different modules of the Academy.

Groups were formed on the first day of the Academy and delivered on the fifth day. Tsinghua and UNEP developed a PowerPoint template to facilitate and streamline the presentation. The challenges identified by the participants were hazardous waste, food waste, air pollution, e-waste, and food packaging. The solutions developed are summarized below.

GROUP 1: COOKRSPAC

Participants: Seven participants; Imsouchivy Suos (Cambodia), Pirun Chan (Cambodia), Sheila Alifia Wahyuni (Indonesia), Tamana Farewar (Afghanistan), Mohammad Mustafa Sahib Zada (Afghanistan), Zhang Mingyang (China), and Li Xiaolin (China) .

Main Contents from Presentation:

- Problem statement: The kitchen space in urban area is limited due to the increase in migration and population growth. Appliances such as e-waste, including waste kitchen appliances is increasing while current policies do not provide enough effective solutions.
- Objective(s): To contribute to the reduction and potential elimination of e-waste, specifically waste from electronic kitchen appliances, expand livable space in the high-density urban area, reduce food and kitchen waste, support urban farm movement, while also providing organic products.
- Solution(s): A kitchen comprising kitchenware library, modular cooking space with compost

tank inside, organic garden outside, with green roof garden and solar paneling. The proposal would be designed together with its business model in phases from 2020-2026, including the App development of CookrSpace, membership rental service, delivery service and sales of organic urban farming products, cooking courses, and mobile CookrSpace through reuse of old containers or buses.

- Potential challenges and limitations:
 - Technical: Availability of space and storage, reliability and maintenance of kitchenware, and solar panel and battery disposal.
 - Social: Behavioral change in creating new habit would take time, ensuring people would return what they rent, and the lack of CE awareness.
 - Economic: Proximity in commuting and costs related to the geographical area, and management issues in maximizing rental schedule.

Outputs & Outcomes (1)				Outputs & Outcomes (2)			
Phase 1 (2020)		Phase 2 (2022)		Phase 3 (2024)		Phase 4 (2026)	
Output	- Kitchenware Central Library - CookrSpace Kitchen - CookrSpace App - Subscription Services	Output	- Kitchenware Delivery Service - Social and Educational Events - Fertilizer from Composted Kitchen & Food Waste - Organic Gardens	Output	- Sub Point Collecting and Reward System - Collected unused kitchen appliances and food waste	Output	- New branch and organic garden - Mobile CookrSpace - Repurposing of old school buses, buses, and shipping containers, etc.
Outcome	- Members use the kitchen space and appliances on demand - Members have bigger and/or freer usable space - Manufacturing partners raise brand awareness for new products which is now a rental subscription services	Outcome	- People are more educated on cooking, urban farming, and responsible consumption - CookrSpace can supply organic vegetables and fruits for inhouse used or sales - Leftover food is used for donation	Outcome	- Households know where to get rid of their e-waste and kitchen/food wastes - Long lasting relationship with members - Brand awareness for CookrSpace	Outcome	- Outcomes from phase 1+2+3 - Larger network of members
Key Actors & Beneficiary Group	- Low and middle-income members - Expats and Students - Kitchen Appliances Manufacturing Partners	Key Actors & Beneficiary Group	- People in need (poverty) - Members within the proximity area - People who are interested in organic food, urban farming, and responsible consumption - Kids and young adults	Key Actors & Beneficiary Group	- Beneficiary Groups from Phase 1 & 2	Key Actors & Beneficiary Group	- Beneficiary Groups from Phase 1 & 2
Estimated Budget	60,000 USD (2 years Opt Cost but excluding land rental)	Estimated Budget	~20,000 USD (2 years Opt Cost but excluding land rental)	Estimated Budget	+20,000 USD +5,000 App Feature (2 years Opt Cost but excluding land rental)	Estimated Budget	? USD (We're currently looking for future partners on repurposing buses and containers)

GROUP 2: FOOD WASTE MANAGEMENT IN AA. THODDO

Participants: Six participants; Fathimath Shamra (Maldives), Le Dinh Khanh (Vietnam), Suzanna Sumkhuu (Mongolia), Sengphechanh PHACHANH (Lao), Akhilesh Reddy TALUSANI (India), and MD Harun OR Rashid (Bangladesh).

Main Contents of Presentation:

- Problem statement: Global overview of food waste. About 30-50% of all food produced globally is never consumed. Food waste is being dumped into the sea damaging the ecosystem of the ocean, in AA. Thoddo, Maldives, where agriculture and tourism are its top two economic sectors. There are 84% of the people in AA. Thoddo who said that climate change negatively affects their productivity (Suma, 2017).



- Objective(s): To improve the food waste recycling system in AA. Thoddo Island, Maldives.

- Solution(s): A proposal is developed into two main points 1) At policy level, conduct a survey on food waste on the island and its implications, establish fine for those that discard food waste into the ocean, develop standards for composting, and provide a free first batch of fertilizer 2) At technology level, build a compost plant and maintain a stable operation and maintenance.
- Potential challenges and limitations: lack of funding, poor cooperation in the community, lack of human resources, odor from the compost center, lack of physical space, lack of amount of food waste(data).

GROUP 3: AIR POLLUTION

Participants: Five participants; Chonnikarn Chukhajorn (Thailand), Chime Wangmo (Bhutan), Biba Jasmine Kaur (India), Phouvisay Vongxay (Lao), Rhomir Samiley Yanquiling (Philippines).

Main Contents of Group Presentation:

- Problem statement: Urban transport are facing road congestion, air pollution, limited parking areas and deteriorating roads.
- Objective(s): To promote the circular system in urban transportation.
- Solution(s): a circular system in urban transport at policy level is proposed through the case study of Indian transport sector, an energy mix model and policy suggestions for circularity below:
 - India's transport sector is large and diverse, and it caters to the transport needs of 1.1 billion people. It is critical for the country's policy makers to take into consideration the nature and extent of impact that the various transport sector policies would have on energy, economy and environment to ensure that their decision making is well informed.
 - An energy mix model is proposed with following attributes: 1) electrification of road and rail transport; 2) improvement in fuel efficiency of light-duty vehicles (LDVs), buses, commercial vehicles, and passenger and freight rail by adopting aggressive fuel-efficiency standards; 3) model shift from private to public transport in passenger mobility; 4) create awareness to help moderate demand for passengers and freight movement.
 - Overall suggestions at policy level for consideration: 1) increased fuel efficiency and modal shift are the low-hanging fruits with the maximum potential for decarbonizing the transport sector as of now; 2) apart from enforcing stringent fuel efficiency standards, most of the other strategies need huge investment and maximum efforts for successful implementation; 3) a labeling program can also be an effective solution to promote the uptake of fuel-efficient vehicles; 4) there is no single silver bullet which can be proposed for the transport sector. The problem requires an integrated multipronged approach towards



decarbonizing the transport sector.

- Potential challenges and limitations are gaps exist in laws and regulations, fragmented institutional frameworks, and absence of reliable transport data.

GROUP 4: HAZARDOUS WASTE MANAGEMENT FOR MYANMAR

Participants: Six participants; Zhang Zhe (China), Chhimi Wangchuk (Bhutan), Li Shite (China), Krishna Chandra Singh (India), Arjuna Srilal Rathlayake (Sri Lanka), and Sao Myatmarlar (Myanmar).

Main Contents of Group Presentation:

- Problem statement: The current methods for hazardous waste treatment in Myanmar are a combination of disposal with "outdated" technologies like incineration in existing crematoria and deep burial, and by open dumping to land, often mixed with municipal waste.



- Objective(s): To improve eco-friendly hazardous waste disposal, and find economical and eco-friendly solutions within 5-10 years.
- Solution(s): A comprehensive proposal is developed which include four main activities of 1) comprehensive regulatory policy development; 2) social awareness campaign to create an environmentally conscious mindset; 3) building advanced facilities to recycle high-value waste (such as ULAB, waste oil and E-waste); 4) encourage stakeholders' involvement in planning and execution (implementation) stage to arrive at a comprehensive long-term sustainable solution. The expected outcome is that hazardous waste will not get mixed with the municipal waste, thereby resulting in a safer environment.
- Potential challenges and limitation: Financial constraints, peoples' mindset and public awareness, weak regional/international collaboration and information sharing, poor law enforcement (weak punishment), the need for technological knowhow (facility construction standards, legal shipment and etc.), and lack of proper infrastructure (for municipal waste and water, medical waste from hospitals and clinics).

GROUP 5: FOOD PACKAGING – LET'S RETHINK

Participants: Five participants; Mohammad Monower Hossain (Bangladesh), Nur Sakinah AhmadnRosli (Malaysia), Bikas Adhikari (Nepal), Bishnu Prasad Belbase (Nepal), Wint Thiri Marn (Myanmar).

Main Contents of Group Presentation:

- Problem statement: Plastic waste is increasing. A total of 600,000 plastics are used per day in Kuala Lumpur in 20 food courts and 30 shopping malls that have 1,000 customers per day.
- Objective(s): To reduce pollution from plastic food packaging, replace plastic with bioplastic, and increase usage of biodegradable packaging.
- Solution(s): A proposal is developed to replace plastic packaging with composition of jute fiber. Policies are outlined, such as ban on plastic using for food, subsidies for bio plastic and awareness raising, to scale up the use of biodegradable packaging made from jute fiber.
- Challenges and limitations: Expertise, economic barrier (finance aid), market barrier (plastic easily accessible), regulatory barrier (policy follows market), custom and social (cheaper products become preferred choice).



Conclusion and Evaluation Results

Conclusion Session

In the conclusion session on the fifth day, all participants gave feedbacks on what they achieved from the weeklong academy and offered suggestions for the future academy. Almost all of the participants acknowledged that the academy is an excellent opportunity to learn, exchange and apply their knowledge effectively on circular economy. The group highlighted that they learned a lot from the interactive modules, especially the practical experiences and cases of CE in China.

Most participants also said that they plan to utilize what they learned into policy-making, as well as their future work and daily life. For example, one participant said, "I have learned the importance of Circular Economy. In the following work and daily life after returning to my country, I will try to put CE into practice to prolong the life of products and make contributions to environment". Another participant also had positive remarks about the academy, "It's really a wonderful academy. From these days' learning, I think most of our participants gained a lot from the excellent and interesting courses and modules. We will use what we have learned in this academy in policy-making and our daily life".

In general, there is a huge interest among young professionals in the region to receive training on Circular Economy. Young professionals in Asia are especially interested in studying cases in their region. Having people from different sectors has been beneficial to the program (i.e. public sector, private sector and civil society/academia) where countries get to discuss on Circular Economy from different perspectives.

Pre & Post Evaluation by Learning Objectives

The evaluation was designed and conducted to measure how the Academy contributed to increase the knowledge, skills and competencies of the participants. To do so, a perception survey was developed based on a scale of 1 (lowest) to 5 (highest) in relation to specific learning objectives, covering seven aspects of CE: CE and its importance, indicator, business model, communication and behavior change, financial instrument, monitoring and evaluation, and technology. The survey was conducted before and after the training (See pre & post self-evaluation form in Annex II).

At the pre-evaluation filled by the participants, the general levels of knowledge or skills on CE were quite low. The average level of knowledge or skills in all the six aspects before training is less than 2.5, among which the knowledge on indicators and business models were at the two lowest levels. At the post-evaluation filled by the participants, the general levels of knowledge or skills on CE increased to 4.2.

All learning objectives shown in the below (Figure 1) reflect increased knowledge or skills on Circular Economy through the 2019 SWITCH-Asia Leadership Academy, as seen from the indicated percentage on how much improvement was done from pre to post evaluation. In general, results from the pre and post assessment also show that there is a low percentage of understanding on three topics; technology, behavior change, and indicator. This indicates the need to revisit these three topics in order to strengthen the capacity on CE.

Since the real impact of the academy on the participants will only be known once time has passed and the participants would have to experience situations in which they can apply the knowledge acquired, a follow-up evaluation survey mechanism (see Annex III) has been designed and will be used to further evaluate what specific knowledge and skills were applied to the issues, as part of the extensive CE learning process and development during the Academy.

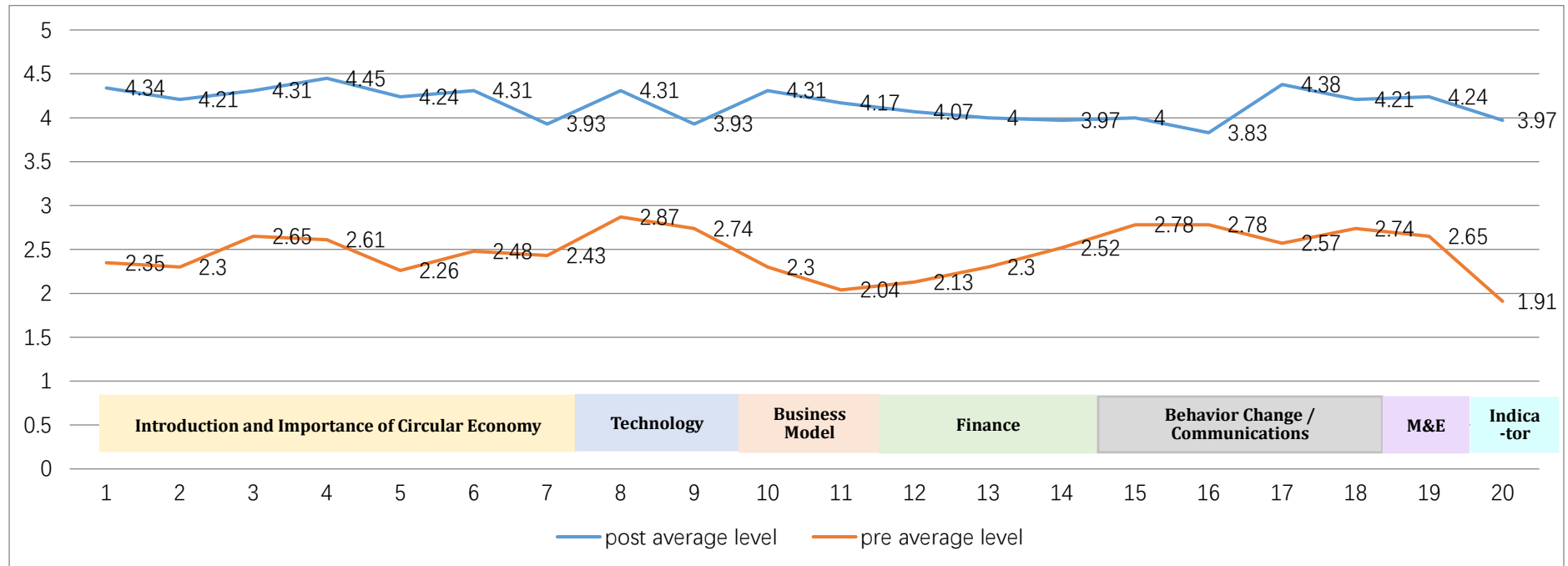


Figure 1 Pre & Post Self-evaluation on the level of knowledge/skills by learning objectives

Learning Objectives	
O1: Able to describe the theory of Circular Economy	O2: Understand essential components of Circular Economy
O3: Understand challenges and needs of a country to promote Circular Economy	O4: Understand roles of policies and regulation to promote Circular Economy
O5: Able to identify tools and options to mainstream Circular Economy	O6: Able to Identify potential sectors to mainstream Circular Economy
O7: Understand how to create effective coordination at national and local levels to mainstream Circular Economy	O8: Understand roles of technology to promote Circular Economy
O9: Able to identify green technology in country context	O10: Understand concept of innovative business models
O11: Able to identify proper business models for Circular Economy	O12: Understand concept of innovative finance
O13: Understand financial instruments	O14: Able to identify proper financial instruments for Circular Economy
O15: Understand concept of behavior changes to promote Circular Economy	O16: Understand concept of communications to promote Circular Economy
O17: Able to identify behavior changes to enhance achievement of Circular Economy	O18: Able to develop communications to enhance achievement of Circular Economy
O19: Understand importance of Monitoring and Evaluation (M&E) for Circular Economy	O20: Able to identify indicators to track Circular Economy

Annexes

I. Agenda

II. Presentations (link)

III. Pre & Post Self-Assessment

Annex I

Agenda

Sunday, 1 Dec. 2019	Arrival in Tsinghua University campus (details of accommodation on campus are provided in the information notes)
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Monday, 2 Dec. 2019	
8:30-9:00	Registration
9:00-9:20	<p>Opening remarks</p> <ul style="list-style-type: none"> • Chaired by Prof. Jinhui Li, Tsinghua University • Mr. Tu Ruihe, Head of China Office, United Nations Environment Programme (UNEP) • Mr. Hou Deyi, Assistant Dean, School of Environment, Tsinghua University • Ms. Feng Mei, Ms. Feng Mei, Project Manager, Cooperation Section, Delegation of the European Union to China
9:20-9:35	Setting the scene (objective and logistics of the Academy) Zheng Lixia, Luz Fernandez and Tunnie Srisakulchairak, SWITCH-Asia RPAC
9:35-10:35	<p>Topic: Why we are talking about CE – Sixth Global Environment Outlook (GEO-6) and GEO-6 for Industry in Asia-Pacific</p> <p><i>Presenters:</i> SHI Lei, Professor, School of Environment, Tsinghua University TAN Quanyin, Chief, General Management Branch, Basel Convention Regional Centre for Asia and the Pacific</p>
10:35-10:55	Group Photo and coffee/tea break (20 mins)
10:55-11:10	<p>Topic: Circular Economy and Waste Management (video)</p> <p>Presenter: Mushtaq Memon, Project Manager of SWITCH-Asia RPAC / Regional Coordinator for Resource Efficiency, UNEP Asia Pacific Regional Office</p>
11:10-12:30	<p>Module1: the concept of Circular Economy</p> <p><i>Session Brief:</i> Examine the origin and details of the circular economy to understand its</p>

	<p>history, its nuances. Learn about the three principles that are the foundation to the circular economy concept, as well as its benefits to businesses, society and the environment, by shifting away from the current, linear economy.</p> <p><i>Presenters:</i> Jo Miller, Consultant circular economy learning Jie Zhou, Senior Programme Officer, Ellen MacArthur Foundation</p>
12:30-13:30	Lunch (1h)
13:30-14:20	<p>Module1: the concept of Circular Economy (cont.)</p> <p><i>Presenters:</i> Jo Miller, Consultant, circular economy learning Jie Zhou, Senior Programme Officer, Ellen MacArthur Foundation</p>
14:20-14:40	<p>Ice-breaking activity Tunnie Srisakulchairak, SWITCH-Asia RPAC</p>
14:40-16:20	<p>Module 2: Policies of Circular Economy</p> <p><i>Session Brief:</i> The role of policies and regulation, how to make policies and case studies will be illustrated.</p> <p><i>Presenter:</i> ZENG Xianlai, Associate Professor, School of Environment, Tsinghua University</p>
16:20-17:20	<p>Group project</p> <p>Each group (consisting of 5-6 participants) discusses and determine their group project goals, eg. one proposal, one solution or one policy design.</p> <p><i>Moderator:</i> ZENG Xianlai, Associate Professor, School of Environment, Tsinghua University Luz Fernandez, Programme Officer SWITCH Asia RPAC, UNEP Asia Pacific Regional Office</p>
18:30-	Welcome dinner

Tuesday, 3 Dec. 2019

09:00-09:15	Recap of Day 1 - Tunnie Srisakulchairak, SWITCH-Asia RPAC
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09:15-12:30	<p>Module 3: Innovation and business models</p> <p><i>Session Brief:</i> Learning about design and innovation is key for circular economy. The scale of what we're designing has shifted from products, to companies, to economic systems. The design thinking approach allows people to explore new ways to create sustainable, resilient, long-lasting value in the circular economy.</p> <p><i>Presenters:</i> Jie Zhou, Senior Programme Officer, Ellen MacArthur Foundation Jo Miller, Consultant, circular economy learning</p> <p>Coffee/Tea break at 10:20-10:40</p>
12:30-14:00	Lunch (1.5h)
14:00-17:30	<p>Module 2: Policies of Circular Economy (cont.)</p> <p><i>Session Brief:</i> Learn what urban policymakers can do to provide conducive environment for circular economy in cities to create a thriving, liveable, resilient world.</p> <p><i>Presenters:</i> Miranda Schnitger, Government Lead, Ellen MacArthur Foundation(dial-in) Lukasz Holec, China Programme Lead, Ellen MacArthur Foundation</p> <p>Coffee/Tea break at 16:00-16:20</p>

Wednesday, 4 Dec. 2019	
09:00-09:15	Recap of Day 2 - Tunnie Srisakulchairak, SWITCH-Asia RPAC
09:15 - 12: 00	<p>Module 4: Technology and Business models - Ecological industrial development towards a greener vision</p> <p><i>Session brief:</i> This session will cover concepts and basic knowledge on industrial ecology, eco-industrial parks and industrial symbiosis, as well as innovation of global eco-industrial park developments. The overview of industrial parks development in China will be shared as case study.</p> <p><i>Presenter:</i></p>

	<p>TIAN Jinping, Associate professor, School of Environment, Tsinghua University</p> <p>Coffee/Tea break at 10:20-10:40</p>
12:00 - 13:30	Lunch
13:30 – 16:30	<p>Module 4: Technology and Business models - Clean production and recycling technology and cases</p> <p><i>Session Brief:</i> This session will address clean production and recycling technology for circular economy and provide cases of clean energy development practices in China with regard to resource endowment, development strategy, as well policy incentives. The promise and problems that we are currently facing will be illustrated, with biomass energy and wind power as cases.</p> <p><i>Presenter:</i> ZHANG Lixiao, Professor, School of Environment, Beijing Normal University</p> <p>Coffee/Tea break at 15:00-15:20</p>
16:30-17:30	Group work

Thursday, 5 Dec. 2019	
09:00 - 09:15	Recap of Day 3 - Tunnie Srisakulchairak, SWITCH-Asia RPAC
09:15 - 10:40	<p>Module 5: Innovative financial instruments for CE</p> <p><i>Session Brief:</i> All investments have consequences for individuals as well as for whole communities and for the economy. In addition to generating financial returns, investments can create jobs and thus have positive impact on society and the environment. Multiple forms of capital are needed to finance circular business models. This session will address key innovative finance concepts and will explore which of the existing instruments are more relevant to financing business models of circular economy in Asia.</p> <p><i>Presenter:</i> Luz Fernandez, Programme Officer SWITCH Asia RPAC, UNEP Asia Pacific Regional Office</p>

10:40-11:00	Coffee/Tea break at
11:00-15:00	<p>Module 6: Behavioral Change and Communication</p> <p><i>Session Brief:</i> Transitioning towards a circular economy requires a shift towards more sustainable lifestyle and behavior. This session will illustrate how policy developments can support sustainable consumption choices; introduce basic social principles to change behavior, and share cases on existing policy framework at national and city levels to support a more sustainable lifestyle. The session will outline communication strategies to promote behavior change towards a more sustainable consumption and lifestyle through case studies.</p> <p><i>Presenter:</i> JING Hui, Communications Director, Energy Foundation(Beijing Office) ZHENG Lixia, Project Coordinator for China, SWITCH-Asia Regional Policy Advocacy Component, UNEP China Office ZHANG Lei, Associate professor, School of Environment and Natural Resources, Renmin University of China</p> <p>Lunch break at 12:00-12:30</p>
15:00-17:00	Group project

Friday, 6 Dec. 2019	
7:30-9:00	Departure from Tsinghua to Beijing Economic-Technological Development Area (BDA) at 7:30
9:00-11:00	<p>Technical visiting</p> <p><i>Session Brief:</i> The technical visit to Beijing Economic - Technological Development Area (BDA) will be arranged. BDA was selected as the pilot district on zero-waste development by the Ministry of Ecology and Environment of China in 2019. The implementation plan and practices of BDA as the pilot district on zero-waste development will be outlined.</p> <p><i>Facilitator:</i> LIN Minsong, Ph. D, School of Environment, Tsinghua University</p>
11:00-12:00	<p>Module 7: Indicators for circular economy performance</p> <p><i>Session Brief:</i></p>

	<p>This module will review the indicator systems measuring circular economy performance, and also share the zero-waste city indicator and performance in China as a case study.</p> <p><i>Presenter:</i> ZENG Xianlai, Associate Professor, Tsinghua University</p>
12:00-13:30	Lunch
13:30-16:00	<p>Project work presentation Each group present their group work results.</p>
16:00-16:30	Certification delivery
16:30-17:30	<p>Feedback sharing by participants Conclusion by SWITCH-Asia RPAC, Tsinghua University Group photo</p>
17:30-19:00	Dinner
7 Dec. 2019	<p>Departure (from BDA to Beijing international airport)</p>



Annex II

Please see all the presentations in the website of Switch-Asia

<https://www.switch-asia.eu/rpac/leadership-academy/>

Annex III

Pre & Post Self-Evaluation

INSTRUCTIONS: This self-evaluation is designed to provide an informal measure on the extent to which the training has contributed to increasing your level of knowledge, skills, and attitudes. Based on your understanding at the end of the training, evaluate your level of knowledge/skills in relation to the learning objectives stated below after the training.

Learning objectives	Evaluate your level of knowledge/skills before (or after) the training				
	When 5 is the highest and 1 is the weakest				
	1	2	3	4	5
1. Able to describe the theory of Circular Economy					
2. Understand essential components of Circular Economy					
3. Understand challenges and needs of a country to promote Circular Economy					
4. Understand roles of policies and regulation to promote Circular Economy					
5. Able to identify tools and options to mainstream Circular Economy					
6. Able to Identify potential sectors to mainstream Circular Economy					
7. Understand how to create effective coordination at national and local levels to mainstream Circular Economy					
8. Understand roles of technology to promote Circular Economy					
9. Able to identify green technology in country context					
10. Understand concept of innovative business models					
11. Able to identify proper business models for Circular Economy					
12. Understand concept of innovative finance					
13. Understand financial instruments					
14. Able to identify proper financial instruments for Circular Economy					
15. Understand concept of behavior changes to promote Circular Economy					
16. Understand concept of communications to promote Circular Economy					



17. Able to identify behavior changes to enhance achievement of Circular Economy					
18. Able to develop communications to enhance achievement of Circular Economy					
19. Understand importance of M&E for Circular Economy					
20. Able to identify indicators to track Circular Economy					