PROJECT REPORT

STRENGTHENING

ONLINE AND OFFLINE SCP TRAINING CAPACITY IN TERTIARY INSTITUTIONS IN ASIA AND THE PACIFIC

Chulalongkorn University
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ACTIVITY 1: FORMATION OF ADVISORY COMMITTEE

Overview

The sustainable consumption and production (SCP) Academy, online course and tertiary curriculum materials aim to respond to the SCP challenges, by improving the knowledge of young professionals from public sector, private sector and civil society organizations who can contribute to the design and implementation of innovative solutions for policies, business models, technologies, financing mechanisms and practices that promote sustainable consumption and production.

A holistic curriculum on SCP should incorporate the new and complementary concepts, which include resource economy, circular economy and industry 4.0 and others. The proposed curriculum also includes the sectoral application of SCP, for instance, sustainable agriculture, sustainable tourism, sustainable cities, sustainable fashion, among others. **The curriculum also delivers well balanced content on sustainable production technology as well as effective policy strategies catalysing practice of responsible consumer behaviour.**

The first advisory committee meeting was held on 25th – 26th September 2018 in Chulalongkorn University, Bangkok. **The advisory committee of the online and offline SCP courses was established and consists of 15 researchers and professors in the field of SCP in Asia and the Pacific regions**. The advisory committees will ensure that the training materials and activities are academically sound, and aligned to international and regional initiatives on SCP so that the course can be leveraged in multiple channels and reach the maximum number of professionals. During the first meeting, the committees agreed to start off with the Circular Economy (CE) online course in the first year and developed the tentative course outline (including 7 modules). The key person of each module will be selected among the experts with interest. Responsibilities of the key persons and responsible groups of committees include:

- Develop procedural workplan to coordinate tertiary curricular package and training outline
- Develop technical content of training outlines
- Host virtual monthly advisory committee meetings

Minutes of this meeting and monthly online meetings are also attached in ***Appendix.***

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ACTIVITY 2: TERTIARY CURRICULA PACKAGE DEVELOPMENT

Curricular package

This project is a part of long-term programme that aims towards 4-year time developing materials for full Master's Degree on SCP. However, regarding this activity, it is more focusing on online course and implementation (SCP Academy training in person) in the first year. Once the structure, content and feedback from those activities are completed, next step is to enhance those materials to be more academic, specific and suitable for Master's Degree level in the year afterwards. Following this meeting, the committees agrees to start off with the Circular Economy (CE) course in the first year. A total of seven modules contains learning objective and topics. Details of each module will be developed by key persons and responsible groups of committee. A summary of the curricular package is as follows:

1. Course description

Asia continues to be one of the fastest-growing region of production and consumption globally. High levels of consumption driven by economic growth are often associated with an increase in human exploitation, environmental pollution, and depletion of natural resources. There has been an increasing awareness for a need of more sustainable actions and practices by academics, business leaders, and governments. While the concept of a circular economy as an approach towards sustainability is becoming prominent in Europe, North America and elsewhere, the concept is still under-explored in the Asian region. For a circular economy to be put into action in Asia, joint efforts by all relevant stakeholders are required.

The Asian Circular Economy Curriculum presents 7 modules: Introduction, Innovation and technology, Policies, Finance, Business models, Indicators, and Behavioural change and communication. Each module includes case studies from Asian countries. After completion of all modules, you will have a better understanding of a closed loop concept under the circular economy in Asian context and beyond.

Learning outcomes:

- Participants will learn about the main driving forces behind that contribute to degrading the environmental quality in an Asian social and economy context; implementation techniques to achieve circular economy, and effective ways for changing consumers' behaviour. Participants will gain an understanding that the circular economies cannot happen on its own, but as a results of interconnected choices people make.
- Based on a range of case studies, participants will be inspired to create and contribute to the implementation of innovative solutions for policies, business models, technologies, financing mechanisms and practices that promote sustainable consumption and production

2. Module 1: Introduction to Circular Economy

Lead authors: Asst. Prof. Dr. Pasicha Chaikaew (Chulalongkorn University)
Ms. Janet Salem (UN Environment)

2.1 Learning objective
- 2.1.1 Understand a paradigm shift from a linear to circular economy
- 2.1.2 Acquire opportunities and challenges of circular economy practices

2.2 Topics
- 2.2.1 Moving towards a circular economy
  - 2.2.1.1 Why the circular economy matters in Asia
  - 2.2.1.2 The "Take-Make-Dispose" model
- 2.2.2 Causal chain (DPSIR analysis framework)
- 2.2.3 A basic concept of circular economy
  - 2.2.3.1 What is the circular economy?
  - 2.2.3.2 The ReSOLVE framework
  - 2.2.3.3 The butterfly diagram
- 2.2.4 Roles of stakeholders in a circular economy
- 2.2.5 Challenges and opportunities in Asia

3. Module 2: Innovation and technology

Lead authors: Prof. Dr. Shun Fung Chiu (Anthony) (De La Salle University)
Mr. Alberto Longos (De La Salle University)
Contributing authors: Mr. Maik Fuellmann (TRIS Corporation Limited)

3.1 Learning objective
- Understand and assess about innovative business for CE

3.2 Topics
- 3.2.1 Conventional vs innovation (Significance of innovation)
- 3.2.2 Data utilization
- 3.2.3 Design thinking
- 3.2.4 Sustainability mindset
- 3.2.5 Case studies in sectors

4. Module 3: Policies

Lead author: Assoc. Prof. Tao Wang (Tongji University)

4.1 Learning objective
- Understand and assess a wide range of CE policies from different scales

4.2 Topics
- 4.2.1 Introduction of Policy
- 4.2.2 Types of Policies
- 4.2.3 International and Regional Policies
  - 4.2.3.1 Sustainable development goals (SDGs)
  - 4.2.3.2 European Union
  - 4.2.3.3 Asia-Pacific
- 4.2.4 National policies in Asia-Pacific
- 4.2.5 Case studies

5. Module 4: Business models

Lead author: Asst. Prof. Dr. Ritika Mahajan (TERI University)

5.1 Learning objectives
- 5.1.1 Enable students to understand innovative business models for CE
- 5.1.2 Demonstrate innovative business models for CE to students

5.2 Topics

- 5.2.1 5R-Reduce, Reuse, Recycle, Redesign, Rethink
- 5.2.2 Challenges and opportunities of:
  - 5.2.2.1 Resource Recovery
  - 5.2.2.2 Sharing Platform
  - 5.2.2.3 Product Life extension
  - 5.2.2.4 Product as service (PSS)
  - 5.2.2.5 Circular supplies
- 5.2.3 Challenges and Opportunities: The Business Case for CE
  - 5.2.3.1 Building partnerships for Systemic Change
  - 5.2.3.2 Education and Training of Managers
  - 5.2.3.3 Top Management Commitment
- 5.2.4 Corporate Social Responsibility, Creating Shared Value and Circular Economy
  - 5.2.4.1 Understanding CSR
  - 5.2.4.2 Implementing CE through Strategic CSR and CSV

6. Module 5: Finance for CE

Lead author: Prof. Dr. Manipadma Datta (TERI School of Advanced Studies)

6.1 Learning objective

Understand the role of finance in circular economy and what would be the innovative ways to finance its emerging requirements.

6.2 Topics

- 6.2.1 Core Components of Circular Economy Finance (CEF)
- 6.2.2 Four Components of CEF
- 6.2.3 Challenges to CEF
- 6.2.4 CEF - Financing Modes
  - 6.2.4.1 Traditional Financing
  - 6.2.4.2 Emerging Avenues
  - 6.2.4.3 Innovative Approaches: Green and Other Initiatives

7. Module 6: Indicators

Lead author: Prof. Dr. Muhammad Irfan Khan (International Islamic University, Islamabad)
Contributing author: Ms. Nadia Akhtar (International Islamic University, Islamabad)

7.1 Learning objectives

- 7.1.1 Provide knowledge to learners to identify indicators and measure their performance and progress in a circular economy (Cognitive domain).
- 7.1.2 Impart skills to learners for developing indicators of circular economy with qualitative and quantitative parameters and link to SDG 12 indicators (Psych-motive domain).
- 7.1.3 Affect learners' behaviour to adopt patterns of sustainable consumption and production (affective domain).

7.2 Topics

- 7.2.1 Type of indicator
- 7.2.2 Indicators of Circular Economy
  - 7.2.2.1 Micro, meso, macro level indicators
  - 7.2.2.2 Circular economy strategies
  - 7.2.2.3 Technology versus socio-institutional
  - 7.2.2.4 Important circular economy indicators in focus
- 7.2.4 Indicators of CE Policy Initiatives

8. Module 7: Behavioural Change and Communication

Lead authors: Mr. Jacob Holder (The Mobius Agency)

8.1 Learning objectives

Provide multi-dimensional knowledge on theories of behavioural change and how it relates to achieving a CE

8.2 Topics

- 8.2.1 The Importance of Sustainable Consumption in Asia
- 8.2.2 Sustainable Consumption
  - 8.2.2.1 Behaviour & Consumption
  - 8.2.2.2 Consumption Trends
  - 8.2.2.3 Links to the Environment
  - 8.2.2.4 Framework for Impact
- 8.2.3 Levels of Behavioural Change
  - 8.2.3.1 Individual Change
  - 8.2.3.2 Organizational Change
  - 8.2.3.3 Public Policy Change
- 8.2.4 Mechanisms for Behavioural Change
  - 8.2.4.1 Nudging
  - 8.2.4.2 Religion
  - 8.2.4.3 Media
  - 8.2.4.4 Advertising and Marketing Campaigns
  - 8.2.4.5 Developing Campaigns

9. CE course evaluation criteria

9.1 Pass 70% of each module

9.2 Accomplish at least 80% of self-paced learning track

9.3 Provide extra-case study on selected module

After gather all the content of each module from lead persons and contributors, here are brief version of the content for the curricula package:

Module 1: Introduction to Circular Economy

Overview

This module introduces the core concepts of the CE, which can be an alternative to the linear economic model that is widespread across the globe. It discusses how the CE might be contributed to reduce natural resource consumption and environmental impacts, and why it is important for countries to consider transitioning to the CE.

Content

Moving towards a circular economy

Why the circular economy matters in Asia

The Asian economy remains the engine of the global economy, but the current circumstances beg the question, "How can Asia's economy grow rapidly without sacrificing the life-sustaining ecosystems and natural resources on which much of the world depends?" Today's economic model focuses on a linear model which is a pattern of "Take-Make-Dispose", this assumes that resources are infinite, easily accessible, cheap, and convenient to dispose. In point of fact, every product eventually has a limit to reach its "end of life" cycle for a number of reasons. This may be due to technology change, changes in demand, or changes in competition. When products are no longer used or required, they are often discarded as waste. Improper disposal may result in environmental deterioration and health risks for communities.

The "Take-Make-Dispose" model

The linear economy has three stages: (1) taking finite resources, (2) manufacturing those resources into products for consumption, and (3) becoming waste after use or at end-of-life. The problem with the "take" part is that we are facing geological scarcity. In the case of smartphones, the process of producing one gadget is linear: it starts with resource extraction, which is followed by production, distribution, consumption, and then it ends up as waste. Smartphone handsets consists of around 40% metals, predominantly copper. The ore grade is declining from 1.6% ore grade in 1990 reduce to about half in 2030. This implies that we need to take a double amount of resources from the ground to have the same amount of copper. In 2015, 80 billion tonnes of materials were taken out of the earth just to extract the copper necessary to produce mobile phones, and that is predicted to rise up to 150 billion tonnes by 2050.

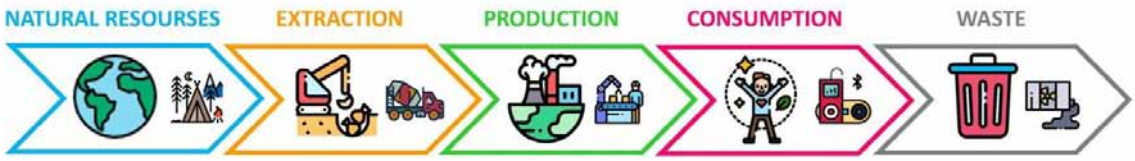


Figure 2.1 A current linear economy represents a "Take-Make-Dispose" model. Natural resources are extracted for producing materials that are manufactured in products to be incinerated or landfilled after use.

The linear economy model is still expanding in the developing world, where capital and labour are not yet optimized within the value chain. Should it continue to expand, it will increase the already unsustainable level of resource use. In the coming decades, we will require productivity gains and quality improvements at a new order of magnitude to

serve mainly a middle-class (McKinsey and Company, 2013). All of this has led to calls for a new economic model.

Causal chain (DPSIR analysis framework)

DPSIR is a systems-thinking framework for describing the interrelations between social, economic, and environmental systems. It is a causal chain that starts with 'driving forces,' followed by 'pressures,' 'states,' and 'impacts,' which lead to 'responses'. The DPSIR framework was introduced by the European Environmental Agency (EEA) and it has been used widely in environmental applications, including the management of agricultural land, water resources, other land and oil resources, biodiversity, and marine ecosystems.

Driving forces

Driving forces are the factors that motivate human activities and fulfill basic human needs. Driving forces can be categorized, for example, economic driving forces (e.g. food, raw materials, water, shelter, infrastructure), and social driving forces (e.g. social relations, equity, governance, cultural identity). This could be studied at the global or national level, on down to the personal level.

Pressures

Pressures can be defined as the ways through which drivers induce changes in the environment. All human activities generate pressures on the environment to different degrees. Pressures can be categorized as environmental pressures (e.g. land use change, discharges, pollution) and human behaviour pressures (e.g. lifestyle, mobility, self-care).

States

State refers to the combination of physical, chemical and biological conditions that affect different ecosystem components. Negative environmental states occur when things like resource use or emissions exceed thresholds or planetary boundaries.

Impacts

Impacts are the effects resulting from a change in state. Changes in the quality and functioning of the ecosystem have impacts on ecosystem services and eventually influence human well-being.

Responses

Responses can come from a variety of sources, including the acts of individuals, government agencies, NGOs, private sectors, and academia. Responses are taken to prevent, compensate, ameliorate or adapt to changes in the state of the environment, depending on the scale of the impacts and the opportunities that are available.

A basic concept of circular economy

What is the circular economy?

A good way to understand the concept of the circular economy is to compare it to the current linear economy whereby we take materials out of the ground, make something out of them, and the products ultimately get thrown away. Even though there is a recycling process for some of the materials, the products are still designed for a linear system so they will come to the end of their lives and most of the resources will be wasted (Figure 2.2).

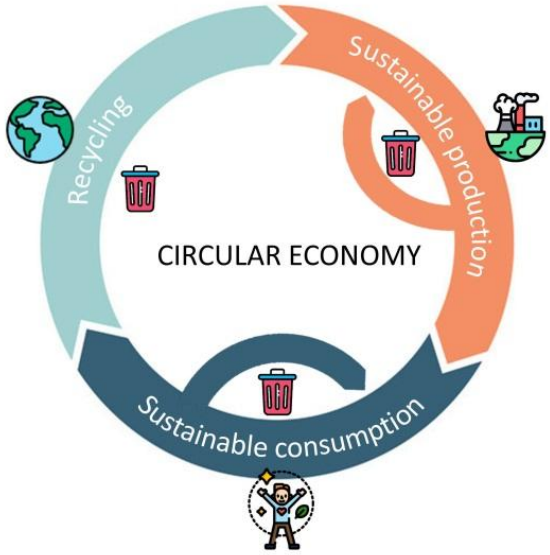


Figure 2.2. A circular economy diagram can be seen as a closed loop system. The system preserves natural resources by retaining the quality and value of products and materials as long as possible throughout the end of their lives.

Three key principles of the circular economy as explained by the Ellen MacArthur Foundation (2018) include:

- Preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows—for example, replacing fossil fuels with renewable energy or using the maximum sustainable yield method to preserve fish stocks.
- Optimise resource yields by circulating products, components, and materials at the highest utility at all times in both technical and biological cycles – for example, sharing or looping products and extending product lifetimes.
- Foster system effectiveness by revealing and designing out negative externalities, such as water, air, soil, and noise pollution; climate change; toxins; congestion; and negative health effects related to resource use.

The ReSOLVE framework

Through research conducted on case studies and expert interviews, the Ellen MacArthur Foundation has broadly identified a set of six actions that businesses and governments can take in order to transition to a circular economy: Regenerate, Share, Optimise, Loop, Virtualise, and Exchange – together, the ReSOLVE framework.

Table 2.1 The ReSOLVE framework and six action areas for agents wanting to move towards the circular economy

Regenerate	Regenerate and restore natural capital: - Reclaiming, retaining and restoring the health of ecosystems - Returning valuable biological nutrients safely to the biosphere (e.g. through anaerobic digestion or composting and enabled by the separation of technical and biological nutrients)
Share	Maximise product utilisation: - Sharing the usage of assets (e.g. cars, rooms, appliances) - Reusing assets (e.g. through resell, redistribution)

Optimise	Optimise system performance: - Prolonging the time products are used (e.g. through maintenance, design for durability and upgradability) - Decreasing resource usage (e.g. increasing efficiency, designing out waste) - Optimising the logistics system through implementation of reverse logistics
Loop	Keeping products and materials in cycles: - Remanufacturing and refurbishing products and components (e.g. through design for disassembly) - Recycling materials (e.g. through making the right material choices in the design process)
Virtualise	Dematerialising resource use and delivering utility virtually: - Replacing physical products with virtual services - Replacing physical stores with virtual locations (e.g. online shopping, virtual travel) - Delivering services remotely (e.g. cloud computing and storage)
Exchange	Selecting resources and technologies wisely: - Shifting to renewable energy and material sources - Using alternative material inputs (e.g. cascading by using by-products or extracting biochemical feedstock from biological nutrients) - Replacing old with advanced technical solutions (e.g. 3D printing) - Replacing product-centric with new service-centric delivery models

The butterfly diagram

The "butterfly diagram", developed by the Ellen MacArthur Foundation (2015), illustrates the concept behind a circular economy model. The diagram is available at the end (Figure 2.3). It highlights the continuous flow of biological and technical materials in a value circle.

In general, organic and technical materials follow different reuse processes. Due to this, it is essential to ensure the separation of these materials after their use. The "bio-cycle" is a term used for cycling organic materials, whereas the "techno-cycle" is for technical materials.

- Organic materials, such as food, water, silk, and wool, can be taken up in the ecosystem by biological degradation. In the bio-cycle, consumption can occur in this cycle as long as the materials flows are not polluted and ecosystems are not degraded. Organic materials are renewable in a balanced ecosystem.
- Technical materials, such as plastics, metals, fossil fuels, crude oil, are finite resources. In the techno-cycle, the finite stock needs to be managed properly. In a circular economy, technical materials are recovered from residual streams after use.

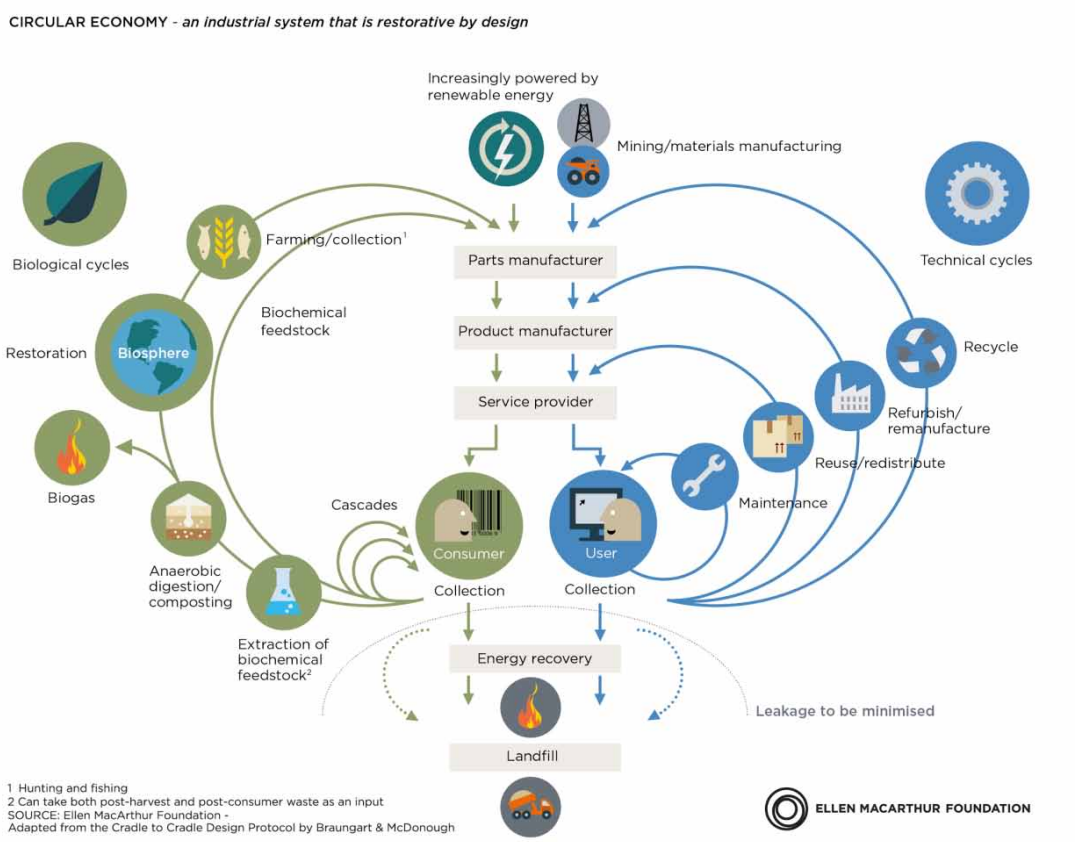


Figure 2.3 The "Butterfly Diagram" showing materials circulating in a circular economy

Roles of stakeholders in a circular economy

In order to accelerate the transition to the circular economy, concordant approaches from all relevant stakeholders need to be engaged. Top-down efforts from public institutions and bottom-up efforts via industry need to be aligned and converged in their implementation strategy. Stakeholders are divided into three primary groups to clearly elaborate their different roles:

Government

Central governments have a critical role to play in delivering the closed-loop economy. Policy needs to provide a robust framework of conditions and incentive structures that enable actors in all sectors to willingly participate in the shift towards the new economy.

Businesses

The role of businesses in the circular economy, could be viewed differently depending on the industries they are involved in. The manufacturing industry has taken the leading role in influencing consumption and production trends, so it has a responsibility to take a leading role in delivering the circular economy.

Consumers

Through their choices, consumers help determine whether products or services they consume are designed for remanufacturing or waste reduction. For this reason, consumers have an important role in the circular economy.

Challenges and opportunities in Asia

Consumer pressure and powerful disruptive trends are weakening the current linear model. In the future, consumers will look for products and services that are tailored to their needs. With an advancement of technology, a growing number of products and services will continue through electronic media. As consumers spend more time using online channels, demand for printing paper will continue to decline. However, the growing purchasing power of the middle class will increase demand for product packaging through electronic commerce. This trend is influenced by changing consumption habits in developing economies. Consumers tend to buy packaged groceries from supermarkets instead of the traditional street market.

A circular economy in action

China Association of Circular Economy, China: The Chinese government began working towards a circular economy in early 2002 as it worked to tackle its urgent environmental issues and challenges around scarce resources. China has long put significant investment in this area, with one of these stats to anchor the statement on 15% double investment between 2006 and 2010. China has a great potential to lead circular economy in Asia and possibly globally.

Fuji Xerox Integrated Recycling System, Thailand: As the necessary technology becomes available, initiatives that monetise recycling are springing up. The Fuji Xerox plant in the Chonburi Province of Thailand which dismantles used ICT is a good example of such innovation. It disassembles over 4,000 tonnes of used printers collected from all over Asia with a 99.6% material recovery rate.

Construction and Demolition Waste Recycling, India: Since 2009, the local authorities of New Delhi started collecting construction and demolition (C&D) waste separately and recycling it. Plants them recycle about 95% of input waste into useful products. Recycled products from C&D waste, such as bricks, pavement blocks, and kerbstones, are found to be of acceptable quality and are about 20-30% cheaper than conventional building materials.

Conclusion

In the face of proliferating signs of resource depletion, the need for a new economic model is crucial. In the quest for a substantial improvement in resource performance across the economy, many businesses have started to explore ways to reuse products or their components and restore more of their precious material, energy and labour inputs. Changing their design thinking and practice and transitioning towards the CE can bring the lasting benefits of a more innovative, resilient and productive economy. These aspects jointly promote competitiveness through efficient resource allocation and higher productivity. What is more, redesigning of industrial structures helps in reducing negative externalities and also helps in improving the overall well-being in society.

Module 2: Innovation and Technology

Overview

This module describes the differences of the conventional vs innovation in the current technological advances and its impact in CE and sustainable development, key innovative technologies and the importance of data in the achievement of CE and sustainable development. It also explains how the design thinking can be a methodology towards sustainable problem solving.

Content

Why focus on Innovation and Technology?

Increasing awareness in environmental challenges and resource scarcity lead businesses and organisations to embrace the concept and principles of CE. One of the key principles of a CE is that the goods of today are the resources of tomorrow at yesterday's prices. The is because the general concept of CE is regenerative by design and intension in which it replaces the 'end-of-life' concept with restoration. It is a system of resources utilization where reduction, reuse and recycling of materials prevails.

Innovation in CE

Define and Differentiate between Conventional vs Innovation

Difference between Conventional and Innovative Solutions

Conventional Solution refers to the traditional linear economy of take – make and dispose. This means that raw materials are used to make a product, and after that the waste is thrown away. In contrast, innovative solution refers to the transition from linear economy to a CE. CE as define by Ellen MacArthur as "an industrial economy that is restorative and regenerative by design and intention".

Difference between Conventional Innovation and Sustainable Innovation

Conventional Innovation traditionally design for systems to source, produce, sell, and use their products or services, making them cheaper to make, easier to sell, or better to use, while sustainable Innovation is defined as innovation that leads to greater profits, better social outcomes and less environmental damage.

Differences between Normal Innovation and Sustainable Innovation

Five fundamental differences between normal and sustainable innovation are shown below:

1. Sustainability factors are balanced with performance, cost, technology and desirability.
2. A wider systems view is adopted.
3. Insights come from stakeholders, as well as customers and consumers.
4. Inspiration comes from nature as well as technology and culture.
5. Sustainable innovation serves sustainable development goals in addition to commercial ones.

Table 2.2 Differences between normal innovation and sustainable innovation

Normal Innovation VS	Sustainable Innovation
Balances performance, cost, tech, cool	+ Environmental and social factors
System= Source > Make > Sell > Use	+ Extract > Distribute > End-of-life
Seeks customers and consumer insights	+ Stakeholder insights
Inspiration from Technology and Culture	+ Inspired by nature
Severs commercial goals	+ Societal goals

Difference between Invention and Innovation

Invention is the creation of a product or introduction of a process for the first time, whereas *Innovation* occurs if someone makes a significant contribution to an existing product, process or service.

Significance of Innovation in CE

Roles of Innovation

- Collaboration of businesses and researchers from different sectors
- Connecting people with different interdisciplinary aspect
- Bring together groups that would not normally meet
- Connecting people to fast-track innovation
- Encourage open and collaborative learning approaches

Types of Innovation

- Technological product and process (TPP) innovations: It comprises implemented technologically new products and processes and significant technological improvements in products and processes. A TPP innovation has been implemented if it has been introduced on the market (product innovation) or used within a production process (process innovation).
- Product innovation: A good or service that is new or significantly improved. This includes significant improvements in technical specifications, components and materials, software in the product, user friendliness or other functional characteristics
- Process innovation: A new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software.

Global Innovation Index

The Global Innovation Index (GII) provides detailed metrics about the innovation performance of 126 countries which represent 90.8% of the world's population and 96.3% of global GDP. Its 80 indicators explore a broad vision of innovation, including political environment, education, business sophistication, and infrastructure and business sophistication.

South East Asia as a region is becoming an important engine of innovation as they are rising quickly through the ranks of GII. Many East Asian countries are ranked within the top 20 in the 2018 GII: Singapore (5th), South Korea (12th), Japan (13th), Hong Kong (China) (14th), and China (17th)

Innovative Technology

The rise of sophisticated hardware and software is changing the way the world lives, plays, and works; and Asia Pacific is no exception to its outsize influence. But one thought is emerging among sustainability advocates – as long as our consumption and production patterns are changing so radically, can we seize the opportunity to leverage the change for sustainability?

Some of the key technologies and trends expanding the influence on society are:

- Internet of Things (IoT)
- Blockchain
- Big Data
- Artificial Intelligence

These technologies are both disruptive and exponential. That is, they are set to replace well-established ways of doing things with new process and markets. Besides, they become more effective and cheaper extremely fast, which will see their adoption skyrocket rapidly.

Achieving CE through Data Utilization

How important is data in achieving CE?

Over the past years, CE have become popular and taking in various forms within the industries, policies, and academe. However, how can someone tell if it has already been achieved? This is when the importance of data comes in the picture. Data, after being collected, analysed, and integrated can highlight specific areas that need more urgent attention due to the fact that perhaps either few data is related to it or most of the data gathered signifies that no progress happened. Data results can also give reasons to work with more urgency and to take somewhat immediate and radical steps towards lowering the economy's impacts in environmental problems.

Sources of Data

There are many possible sources of data that one can look into. Primary sources such as original researches, survey data like census or economic statistics, reports given by direct observer/data collectors and self-collected data can fuel up data collection phase. Moreover, one can also choose to gather specific material data form secondary sources such as reports from banks, e.g. IMF, ABD, etc., government sources, corporate filings e.g. annual reports, media e.g. broadcast and internet, and NGO data collection initiatives.

Importance of Data Standards

Data standards are imaportant to foster seamless exchange of data and it helps improve the ability of involved groups to exchange data efficiently and accurately. It also assists secondary data users in understanding, interpreting, and using data appropriately.

Design Thinking: A Methodology Towards Sustainable Problem Solving

Design thinking and sustainability

Sustainability concept is based on the fact that the earth's resources are not limitless. Sustainability promotes consumption of products, services and systems that are better for society, have less impact on the environment and satisfy the user's needs. Design thinking is a methodology for innovation that combines creative and analytical approaches and requires collaboration across disciplines. When the sustainability principles are combined with the design thinking methodology can have more impact towards promoting and achieving sustainability.

Design thinking methodology

Design thinking uses designer's sensibility and methods for problem solving to meet people's needs in terms of technological feasibility and economic viability. The methodology brings a process towards building sustainable systems, services and products. It is about using design tools to tackle more complex problems, rather than focusing on enhancing the look and functionality of products, it is about designing user experiences, instead of consumer products.

Broader principles of design thinking

- Human-centered approach: Design thinking shifts perspective from technical to one in which human biases and heuristics play a role, and where personal values, attitudes, beliefs, cultural settings are considered when designing solutions.
- Research-based: Design thinking applies qualitative techniques of information gathering such as ethnographic, interviews, observations and immersion into the context
- Design thinking looks at a broader contextual view: The contextual view clarifies the boundary of the system and its interface with the environment in which it operates.
- Collaborative and multi-disciplinary: Design thinking serves as a valuable common language that diverse teams and groups of people can use to effectively collaborate on challenges and projects. With a multidisciplinary team, the solution is developed and relatable to more people. Iterative deliveries and prototyping: Design thinking is a creative human-centered discovery process followed by iterative cycles of prototyping, testing and refinement. It also promotes the production of provisional outputs that can be tested with the user in order to develop understanding of both design problems and alternative solutions

Conclusion

This module provides insights into the concept of how innovation and technology can impact in CE and sustainable development. The aims of this module are to increase public awareness about how innovation and the CE are comparative advantages for companies, institutions, entrepreneurs, and the country as a whole, as well as to promote a faster and more efficient technological transition towards a sustainable economic model. In order to meet CE, modern and innovative solutions should be applied for the recovery of environmental resources. Innovating is inventing something tangible and efficient solutions to generate and restore resources. Many companies have noticed that linear economy increases the exposure to ecological risks because of the unsustainable consumption and production pattern to satisfy human wants. Researches and new innovative solutions such as eco innovation and business model innovation drive the transition from linear economy to CE.

Module 3: Policies

Overview

This module provides a synthesis of CE policies mainly in Asia-Pacific. The learners will get to know cycle of policy; current status of CE policies; and explore policies in different levels from international, national including its drivers and evolution. Case studies are also presented from the leading countries showing how they construct and promote CE plans and practices.

Content

Policy Cycle

- Problem identification: Identify issues demanding policy attention that will be recognized by policy community and general public
- Policy framing: Determine guiding policy principles, develop a policy position, define policy goals, and propose procedures
- Policy implementation: Select policy instrument, allocate resources, undertake communication and enforcement activities, and establish monitoring mechanisms
- Monitoring & Evaluation: Undertake ongoing monitoring and evaluation of a policy to enable learning and enhance performance

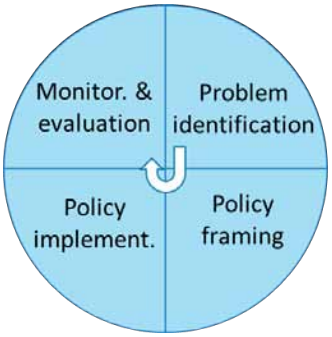


Figure 2.4 Policy Cycle Diagram

International Policies

Since an initiation of SDGs by UN, a number of related international laws based on treaties applicable to countries and over 350 Multilateral Environmental Agreements (MEAs) relevant to Sustainable Consumption and Production, and CE have been highlighted to guide and shape the way policies could be designed to promote more actions on sustainable lifestyles. Some samples of related agreements are namely UN Framework Convention on Climate Change (UNFCCC), Coordination of free trade and environmental conservation by World Trade Organization (WTO), Basel Convention, Stockholm Convention and Montreal Protocol.

Regional Policies

- Europe has 'EU Action Plan for the CE' since 2015 together with a wide body of actions from production, consumption to waste and recycling. Focus areas are plastic recycling, food waste, critical raw materials, C&D and biomass.
- Asia-Pacific has several collaborative platforms and dialogues created such as Environment Ministers Meetings of ASEAN+3 and Tripartite (among China, Japan and Korea), also Asia-Pacific Roundtable for Sustainable Consumption and Production, etc.

National Policies

According to mainstreaming 5-year plans (5YPs), a list of countries has included environmental objectives related to sustainable consumption and production into their policies. A list of sample policy framework of each country can be found in the table below:

Table 2.3 Policy framework of Asian countries

Country	Policy framework
Bangladesh	National Sustainable Development Strategy (2010–2021)
Cambodia	National Policy and Strategic Plan on Green Growth (2013–2030)
China	Integrated Reform Plan for Promoting Ecological Civilization (2015); CE Promotion Law (2009); CE Development Strategies and Recent Action Plan (2013)
India	National Environment Policy (2006)
Indonesia	National 10 Year Framework Programmes on Sustainable Consumption and Production (2013)
Japan	Basic Act on Establishing a Sound Material-Cycle Society (2000); Fundamental Plan for Establishing a Sound Material-Cycle Society (2003) (2008) (2013) (2018)
Laos	Strategic Framework for National Sustainable Development Strategy for Lao PDR (2008)
Malaysia	National Sustainable Consumption and Production Blueprint (2016–2030)
Pakistan	National Action Plan on Sustainable Consumption and Production (2017)
South Korea	National Strategy for Green Growth (2009–2050); Five-Year Plan for Green Growth (2009–2013) (2014–2018)
Thailand	National Sustainable Consumption and Production Roadmap (2017)
Vietnam	National Strategy on Green Growth (2012); National Action Plan on Sustainable Consumption and Production to 2020 (2016)

Types of CE Policies

- Mainstreaming in macroeconomic policy influencing CE
- Laws and regulations: System of CE laws in Japan; ban of plastic bags
- Standards: British Standard for CE (BS 8001: 2017)
- Taxation: Landfill tax in New Zealand
- Full-cost pricing: Pricing reform of water and energy; waste charging (PAYT)
- Incentives: Subsidy to recycling start-ups; green credits
- Extended producer responsibility: Making the product manufacturer responsible for the entire life-cycle of product, especially for take-back, recycling and final disposal; Deposit-refund of bottles and packaging
- Sustainable public procurement: Green procurement in Japan

- Eco-labelling: Green label in Thailand, Ecomark in India
- Eco-industrial development: Eco-towns in Japan; Eco-Industrial Park (EIP) initiative in Korea

CE policies

To delineate how CE is integrated into policies in Asian countries, samples from Japan, China, South Korea, India and Thailand were given in this module. However, to make this section concise, only cases from Japan and China are presented as follows:

Sound Material-Cycle Society (SMCS) in Japan

SMCS was defined by the 'Basic Act on Establishing SMCS' in 2000 as "a society where the consumption of natural resources is restrained, and the environmental load is reduced to the greatest extent possible, by restraining products, etc. from becoming wastes, etc., promoting appropriate cyclical use of products, etc. …". The initiation of SMCS was begun since 1990, numbers of act and plan has been constructed and developed until the latest (4th adjustment) in 2018.

The latest adjustment identified 7 pillars of the plan as shown in the diagram below:

Figure 2.5 Seven pillars of SMCS

The other dominant impetus to the establishment of SMCS are expressly:

- International Resource Circulation: a system aims to secure and create resource efficient society by contributing their know-how on high-quality environmental infrastructures through a package of outstanding technologies, institutions and systems. This programme is organized in cooperation with 6 countries in the Memorandum of Cooperation on Environment Cooperation (MDC); 17 countries in Joint Crediting Mechanism (JCM); and 31 countries in African Clean Cities Platform (ACCP).
- Act on Green Procurement: this act was enacted in 2000 for public authorities to follow including basic guidelines and a list of designated procurement for works, goods and services which seek to contribute to closed energy and material loops within supply chains, while also avoiding environmental impacts and waste creation.
- Eco-towns: 26 eco-towns were approved in 1997-2005 with the objectives of creating integrated waste management sites and reviving local industries through

- innovative recycling development. The creation of the eco-towns will be led by local authority first, who has the best understanding of their local areas, will draw the Eco Town Plan submitting to the National Government, Ministry of Environment and Ministry of Economy, Trade and Industry, who will grant budgets for implementing the projects. This money will be allocated to Innovative Recycling Plants and Town Planning Community Recycling and Outreach to implement their works. In the meantime, Local Enterprise, Research and other Non-Profit Organizations, and Citizens will have their role on executing and participating with the projects in order to keep it going well.

To mention the performance of SMCS, Material Flow Accounting Diagram (Figure 2.6) has shown key messages on entering only sufficient amount of material into the economy can decrease amount of stocking and maintaining needed during the process, while increasing recycling rate can help serving enough resources to be circulated within the system and this will eventually generate less waste out to the landfill. To ensure effectiveness and efficiency of the performance, three indicators used for SMCS are namely: Resource Productivity, Final Disposal, and Cyclical Use Rate (Resource base or Waste base).

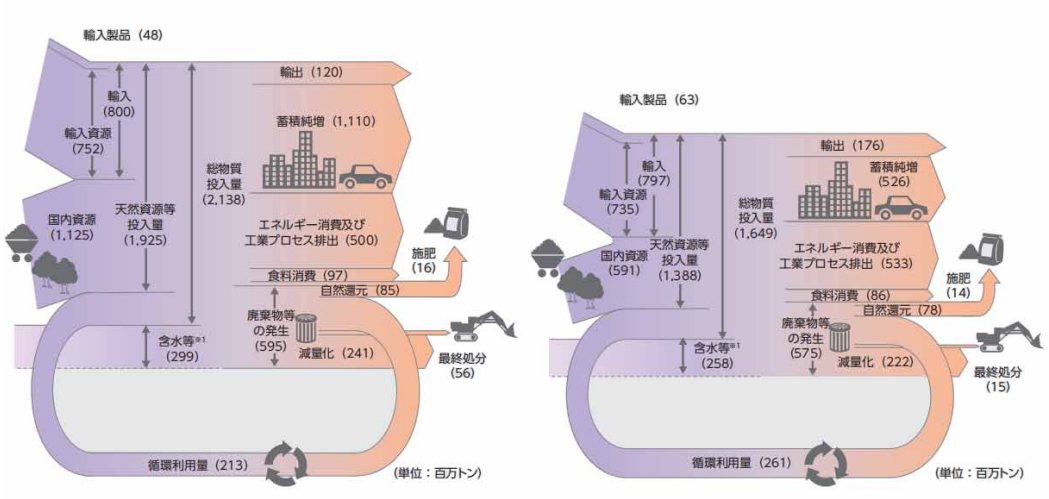


Figure 2.6 Material Flow Account Diagram

CE in China

According to China's national development strategies, five-sphere integration was identified, and one of the five key areas of development is ecological civilization by having CE as one of the main goals inside. CE division in China was established since 2005 in National Development and Reform Commission (NDRC) as a dominant macroeconomic management agency. Then, in 2009, 'CE Promotion Law' was enacted. The term 'CE' was defined as an umbrella term for 3R activities (Reduce, Reuse and Recycle) during production, circulation and consumption.

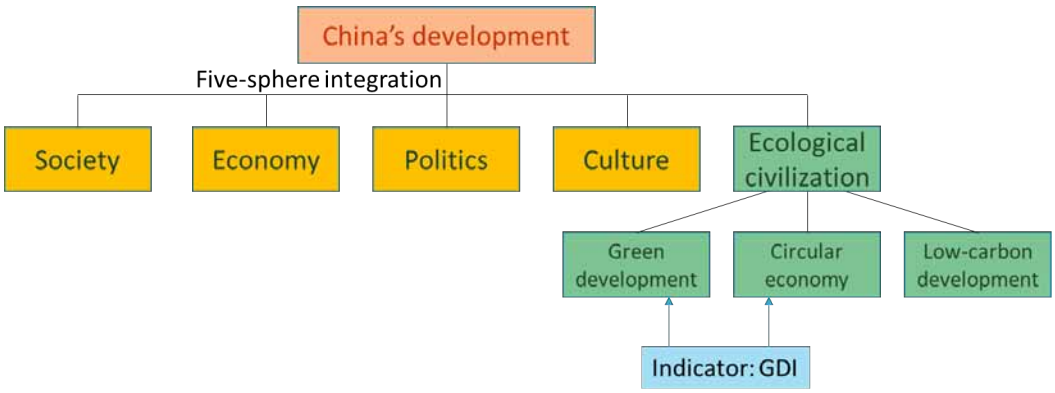


Figure 2.7 Structure of China's national development strategies

After that, China has been continuously including and developing CE until the latest 13th Five-Year Plan (2016-2020), the present one. This plan was constructed following 'CE Promotion Law' and 'Cleaner Production Promotion Law'. The actions planned are organized under the conduction of responsible government agencies.

Some of the planned projects are expressly:

- Circular Transformation of Industrial Parks: over 2,500 national and provincial industrial parks are expected to be transformed by 2020. With seven tasks on spatial planning, industrial chains, efficient resource utilization, centralized pollutant disposal, green infrastructure, and advanced management.
- Resource Recycling Base: this programme is planned to identify specific industrial parks/zones to handle urban waste (including MSW, food waste, C&D, sewage sludge, etc.) and recover recyclable resources. It was expected that first 50 bases will be approved by NDRC in September 2018.
- WEEE Fund: WEEE recycling was a pilot area for implementing in many OECD countries. In China, WEEE recycling was a pilot area for implementation of extended producer responsibility (EPR). A WEEE fund system was enacted in 2012 and applied to TVs, refrigerators, washing machines, air conditioners, and personal computers. The State Administration of Taxation and the General Administration of Customs are responsible for collecting the fund from the domestic producer and the importer, respectively. Then, the fund will further converge into a fund pool that is managed by the Fund Operation Agency. According to this instrument, formal dismantling and recycling of WEEE had increased to nearly 50% by 2015. However, there are still some challenges since 90% of the fund is from governmental budget and it takes over than a year to receive the fund.

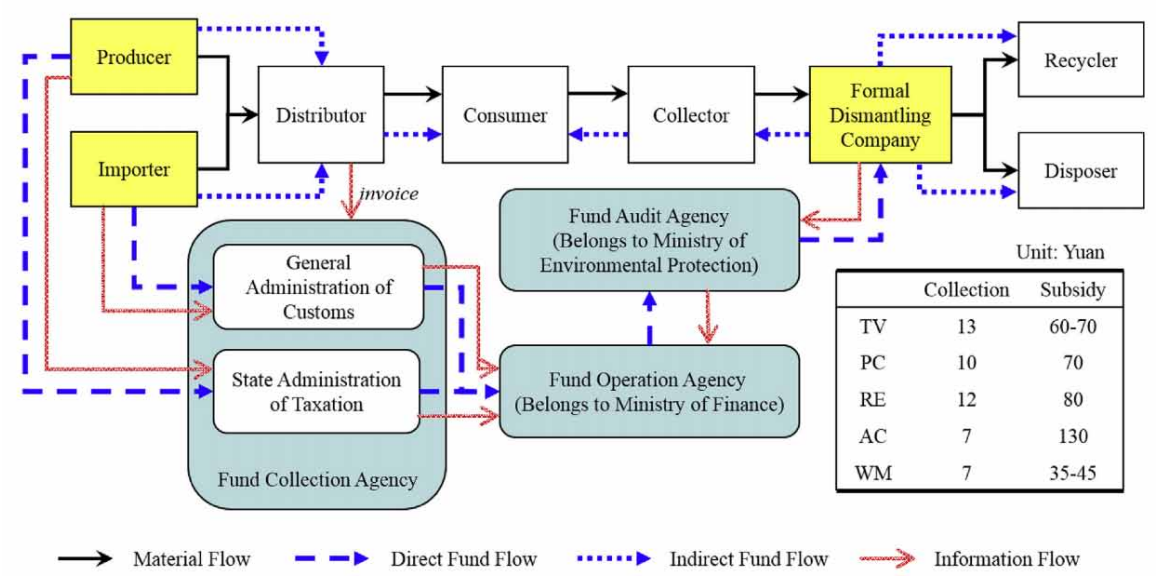


Figure 2.8 Diagram of WEEE Fund

After a period of developing policy for promoting CE, a new 'Action Plan for Promotion of Extended Producer Responsibility' was created in 2017. The objectives are to formally recycle 40% of targeted products by 2020 and 50% of general recycling by 2025. The focus will be on Waste Electrical and Electronic Equipment (WEEE), End-of-Life Vehicles (ELVs) and Lead-acid batteries and beverage packaging.

Conclusion

As can be seen, CE policies have become a significant issue embedded in high-level policies from international organizations to local regulations and practices in most Asian countries with the aims on creating sustainable consumption and production or, in short, promoting sustainable lifestyles and green growth for all. Methods and samples described in this module provide some basic ideas in considering policy design which emphasize plenty of cooperation between central government and local agencies including local citizen in order to sustainably maintain projects to success.

Module 4: Business Models

Overview

This module provides insights into the principles, strategies and applications of CE through innovative business models. It describes the fundamental 5R principles - Reduce, Reuse, Recycle, Redesign and Rethink, five different innovative models - resource recovery, sharing platform, product life extension, product as service and circular supplies, and associated challenges for the business case for CE. It also demonstrates the changing paradigm of CSR and the associated opportunity of leveraging CSR for CE.

Content

Why focus on business?

Business organizations have been the key stakeholders in driving our consumption and production patterns and shaping the economies for years. The traditional take-make-waste paradigm has resulted in environmental degradation and destruction through affecting millions of lives worldwide. With an increasing awareness among societies about the ramifications of the traditional business models, business houses are waking up to the challenge of adopting the principles of CE in their core business models. The CE models reduce pressure on natural resources and provide more sustainable ways of consumption and production through reducing usage, recycling waste etc. and improving the circularity and transparency of value chains. The business organizations, given their sphere and wide spectrum of influence, have immense potential to contribute to achieve the goal of CE.

The business case for CE

Various studies have been conducted to explore the CE strategies of companies, and the relationship between such strategies and financial performance indicators. But the evidence is mixed. In many cases, the subject of investigation has been restricted to CSR or philanthropy to be precise, rather than CE. It must be emphasized that the concept of CE is based on long-term thinking; not a short-term perspective. Thus, any data used to reflect the relationship between CE and financial performance may not reveal any significant insights. This is not only about appreciating the need for social or environmental consciousness; it is about paradigm shift in the mindsets of business managers.

Three important areas where the potential of CE is 2.54 cm very promising and makes a lot of business sense are

- resource optimization through ‘recycle, re-use, reduce, redesign and rethink’ strategies in business processes and supply chains,
- building and sustaining brand value through stakeholder engagement and support including fulfilling regulatory requirements, and
- selling to a market of consumers ready to buy CE products and services.

5R principles - Reduce, Reuse, Recycle, Redesign and Rethink

The philosophy behind the 5R Principles is to transition to a mindset in the corporate world where the challenge of CE starts being looked at as a massive business opportunity for creation of wealth. According to the UNEP Innovative policy for Low Carbon Lifestyles and CE Issue Brief, “The CE is one in which energy is renewable and all raw materials are recycled endlessly in production or returned harmlessly to the natural environment.” The CE is mostly defined as a combination of reduce, reuse and

recycle activities, and often it is not highlighted that "The CE necessitates a systemic shift."

Reduce

It is the process of converting waste material into new products/materials for various uses. Since recycling is about reusing the otherwise to be discarded materials, it also contributes to reducing consumption. However, recycling is not just about collecting and converting, it's a complete economic system. There is cost associated with collection and processing of wastes, setting up the recycling facility and there is market uncertainty associated with the demand of recycled products. Business organizations which have been able to do it, have successfully embraced recycling for achieving the goal of CE, and have also nullified the three myths associated with recycling by citing various examples to show that cost of recycling is not very high, the quality of recycled material is not bad, and the availability of recycled products is reliable.

- Adidas: The Adidas X Parley shoes made from ocean plastic, not only help in recycling this waste, but also provide a market opportunity to Adidas.
- Phinix: This company works by collecting textile waste and converting it into fashion accessories, footwear, and other lifestyle items rather than discarding all these materials in landfills. The company prefers to use the term – upcycling, which is an endeavour to suggest that recycling adds value to the products

Reuse

The principle of reduction is based on a careful analysis of current policies and practices for running the business, as well as adopting innovative methods for optimally utilizing resources. Supported by a visionary leadership committed to sustainability, business organizations can focus on reducing consumption of raw materials, and energy to boost the CE.

- Interface: It has reduced its carbon consumption by 90% and water consumption by 95% by committing itself to the cause of CE between 1996 - 2014. The company now barely uses any water in the manufacturing process
- FoodPanda: A popular food delivery service in Thailand, plans to introduce an application for people ordering food through their application to 'opt-out' for plastic cutlery while placing the order, if this happens for 10 percent of the orders, it will save more than 2,50,000 sets of plastic cutleries.

Recycle

The Reuse principle is based on imagination and inspiration for re-using products, which otherwise would have been discarded. Reuse initiatives help save cost and increase span of investment by increasing the life of products. Many business organizations are coming up with new, innovative ways of reusing their resources.

- *Anthill Creations*: The company uses scrap tyres to build playgrounds for children of underprivileged families. The company has completed 9 projects in four different Indian cities by utilizing more than 830 tyres.
- *Karma*: It is an application-based business organization that sells food waste. Instead of discarding food waste, organizations like coffee houses and restaurants can sell their food through Karma's application to other restaurants and grocery stores. This creates a win-win situation for all the parties involved.

Redesign

This principle entails an endeavor for CE that's restorative and regenerative through redesigning products, polices and business models. However, it is not an easy job and

necessitates getting the basics right, looking at simplified versions of designing, learning from others and creating a network of pioneers for getting it started.

- *Ecovative*: It is a company that produces fully compostable packaging material as opposed to packaging made of synthetic material. This eco-friendly material is made from mycelium that grows in and around agricultural by-products. Besides, it is not expensive and can take any desired shape.
- *Patagonia*: An American clothing company that sells sustainable outdoor clothing and runs the country's largest outdoor repair shop for clothing. The company has also launched an e-commerce platform for its Worn Wear Initiative to sell used Patagonia clothing as well as provide information to the customers on 'how to repair' and so on.

Rethink

The principle of Rethink for CE strives for creative thinking in organizations and implementing the creative thinking through innovations that change the business as usual scenario. Different organizations have slowly started to rethink for not only saving the planet, but for direct economic benefits for business while reducing negative externalities.

- *Rolls-Royce*: In 2002, the company launched *Corporate Care* and added a range of additional services including the facility to lease engine access during off-wing maintenance. According to the company, this initiative has resulted in a huge customer base of the company including more than 500 airlines, 4000 operators, 160 armed forces, 4000 marine customers in over 80 countries.
- *Fashion for Good*: It is an accelerator that supports new generation start-ups working for CE by rethinking their offerings, including a wide variety of innovations from bio-based dyes, fibres made from banana trees to usage of softwares for closet management. One such start-up has created a cloud platform linking buyers and employers to worker's everyday lives while another creates dyes and fibers from microorganisms.

Innovative business models

There are companies that have already started working on the principles of CE. These companies form a group of innovative business models for CE. These models can be divided into five categories as follows.

Resource Recovery

This module focuses on recovery of all the resources employed in the business model. Using new technologies, the businesses try to eliminate any material leakage and maximize economic value of their resources. This is suitable for organizations that trade in volumes and are working with materials which can be recovered cost-effectively.

Sharing Platform

This business model involves a focus on increasing collaborative consumption by facilitating sharing of resources, products and services. This model maximizes usage and reduces cost. The companies where core business proposition is derived from sharing of a resource, can derive value from this model.

Product Life extension

This business model is based on extending the lifecycle of the products so that they are used for a longer period through repair, remanufacturing, upgrading, remarketing and so on. This could also provide an additional source of revenue to the company. This model can be useful for capital intensive companies.

Product as service

This business model promotes offering the product as a service rather than encouraging the customers to buy and own the product. This works well for companies which sell a unique product and own a high capital share such that there is stable demand for their product in the market.

Circular supplies

In this model, the company is based on production and consumption system that utilizes only renewable or biodegradable inputs and no waste is generated in the system. This is a dire need for sectors that have major contribution to business environmental footprint. It works on the principles of minimizing waste and maximizing efficiency.

The changing paradigm of CSR for CE

CSR is an evolving concept. The literal meaning of CSR is that business should be responsible for contributing to the society. However, it seems that CSR is a myth; an attempt to put wrong doings under covers or a mere whitewashing exercise to give an angelic appearance to profit earned by any means. Even if CSR is mandatory, it is meaningless to expect business to compromise with profits. Just like government exists for social welfare of people, business exists to make profits for economic development. A win-win situation is the concept of CE where business houses indulge in projects which create social as well as economic value. It should not merely exist in the stack of documents. It should not be something external to business, but something embedded in the DNA of the organisation.

The foundation of CSR for CE is to be supported by three pillars. First is the commitment to ethical and legal compliance. Second is the implementation of business ideas which align interests of business and society. Third is a set of basic requirements for achieving the first two.

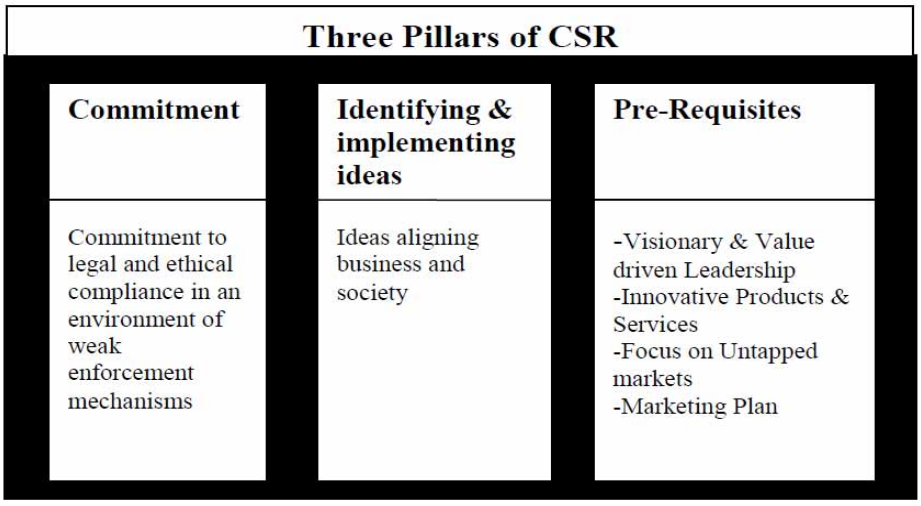


Figure 2.9 CSR for Circular Economy: Three Pillars

Conclusion

This module described in detail about a variety of business concepts and models for achieving the overarching goal of moving towards a regenerative and restorative CE. The idea is to look for opportunities and utilize them through initiatives. Each initiative will be a step in the direction of CE. There is a lot of debate about corporate world not fulfilling its social responsibility. Both business or an individual are all required to be socially responsible. Moreover, individual social responsibility is as important as corporate responsibility. The very word business implies that these organizations are for profit and not for charity. Profit is not a bad word. Only if we call spade a spade, the potential inherent in the idea of leveraging the basic principles of CE into core business and viewing these as an opportunity and not as a burden can develop. This way the organizations will use CE as a source of success, innovation and profitability.

Module 5: Finance

Overview

Since a transition from linear to CE involves changing business models, views on investment and financial management are also crucial to enable the transition and run projects smoothly. Especially for CE, long-term capital requirement and risks are needed to be understood by investors. This leads to high demand on innovative mechanism to mobilize the capital for CE. The module will introduce appropriate sources and instruments to support financing in CE projects.

Content

Basic Concepts

Circular Economy Finance (CEF) refers to any type of financial instrument, mechanism or fund that is applied or invested only for financing or re-financing both for a whole project or a part of circular economy activities. Generally, financial risks which can be measured through creditworthiness of the borrower and value of the underlying asset or collaterals. The bigger the firm, the higher possibility on creditworthiness and collaterals. For circular economy, risks associated with uncertainty in the demand for circular products as consumers fail to anticipate the value of the product in further cycles, as well as supply chain partners. Therefore, to evaluate and select projects, stakeholders must understand how financial products fit in the business model or targeted impacts, eligibility and exclusion criteria, environmental and social sustainability objectives, and overall performance of the project and portfolio. These comprehension process will enable investors to be aware of the challenges and be able to choose suitable methods for financing their circular economy projects.

Traditional Financing

Public and Multilateral

Refers to financing by banks and financial institutions. Banks at domestic and global levels offer finance for green projects. Particularly climate finance funding is there that can be availed for CE business initiatives.

- Bank financing provide lending to finance circular businesses with guarantees at corporate level. However, as circular business firms may face collateral problems, cash-flow based loan would be more suitable since the uncertainty in the demand for circular products as consumers fail to anticipate the value of the product in further cycles. This affects in favour of leasing services since it gives enterprises predictable residual values and better management of supply chain. This leads to adaptation on balance sheet loads and lease agreement between banks and circular firms that will enable firm's creditworthiness rather than the normal system worked in linear economy.
- Multilateral Development Banks (MDB) such as World Bank Group of Institutions, International Fund for Agricultural Development (IFAD), Asian Development Bank (ADB), BRICKS countries are taking together a new developing bank, etc. Since requirement for transition is huge in trillion of USD, huge finance is needed because, for example, when you want to enter the market, you need to initiate your investment as an entry level prices at the very high price. MDBs provide services including policy- based funding (PBL), grants, guarantees, equity, line of credits, and advisory services. This includes the provision of concessional finance. Therefore, cheaper finance from MDBs is very much needed to provide support system to the developing nations help them build up resilience to worsening

climate impacts. MDB funding is also critical to catalyzing private sector climate investment in the developing nations. Lately in 2017, the world's largest public banks (MDBs) committed USD35.2 billion to climate financing for developing countries and emerging economies, a new record with 28% or around USD9.9 billion was funded to Asian nations.

Private

This method provides private funds for major capital investments particularly through security-based financing. In a private finance initiative (PFI), private firms are contracted to complete and manage public projects which is called, for example, a Public-Private-Partnership. Due to the higher growth rate in Asian countries, particularly in south-eastern part of the continent, in 2017 huge funds of USD23.5 billion, from global private equity (PE) investors and venture capital (VC) firms, has flown in, the first time the number is larger than funds thus received by Europe, an appropriate strategy thus to mobilize funds is critical. This is to be mentioned that cases of Social Impact Bonds (SIB) still remain a choice to explore, as well as a stable momentum on generating Impact Investors who could play a significant role in circular economy finance (CEF). Impact investing is a subset of socially responsible investment (SRI). This could substantially help in sustaining CE which yet to be in a stable state and fueling innovative development for turning the whole economy to become fully circular.

Emerging Avenues

Crowdsourcing

A method sourcing finance and ideas from a large number of internet users. It is the collective effort of many individuals who network and pool small amounts of capital to finance a new or existing business venture especially the emerging Fintech industry. Each campaign is set for a goal amount of money and a fixed timeframe, each day is counted down and the money raised will be tallied up for visitors to follow its success. As the problems mentioned in traditional finance, crowdsourcing could be immensely useful for CE. It can offer lower transaction costs, enhance convenience for end users and increase access to credit and investments for underserved segments of the populations and businesses. However, regulations on this area has not been much yet developed worldwide.

Venture Capital (VC)

This method is a type of private equity, intend to provide finance to startup companies and small businesses that are believed to have long-term growth potential or high-potential high-risk projects. VC funds generally provide long-term, ten years on average, but limited period equity finance to the firm when it seems to be too early to raise fund from the market. This makes VC become another good financing method for circular businesses. At the end, Venture capitalists would get their reward through the exit route of Initial Public Offerings (IPOs).

Peer-to-Peer (P2P)

Peer-to-Peer, also known as Crowdlending, is a lending service acting as intermediary in matching lenders with borrowers, mainly on online platform. Each matching will be charged for a service. With this platform, lenders and borrowers can negotiate for better interest rates and usually it requires less collateral or free. Hence, the final deal could be low cost transaction, low interest rate, and overall cheaper borrowing than other methods. However, challenges could be risk during the process on timing and effort for the borrowers to make a deal.

Initial Coin Offering (ICO)

This is a blockchain based financing technique offering crypto currency to raise funds. It acts as fundraisers by creating a public chain of records in which each new logged transaction. In exchange for their support, investors receive a new cryptocurrency token specific to the ICO as a profit if that cryptocurrency succeeds and appreciates in value. ICOs is almost the same as IPOs in mainstream investment world but unlike IPO, instead of stock, virtual coins or tokens are issued in exchange for a cryptocurrency; and greater transparency, immutability, consensus-building and traceability are given from using ICO. In 2017, around USD 5.6 billion was raised through ICOs through 435 successful issues. The investors also gained quite a lot with an average of more than 12 times gain. However, this method still faces different regulations in different countries to protect investors from scams and bubbles; still it remains an easier route for fundamentally strong high-potential business models to explore and finance their circular projects.

Innovative Approaches

Green Finance

Green Finance refers to any financial instrument and investment issued and done in exchange for the delivery of verifiably positive environmental impact. It consists of financing of green investments; financing of public green policies; and developing of green financial system. Circular business enterprises are considered as benefit to green financing. Resource Efficiency Programme under UN Environment offers the service of reviewing countries' policies and regulatory frameworks for green financing system. Some current major innovations are:

- Green Equity: Circular businesses can issue Green Equity since CE's aim is to propel green and sustainable development. This can be done by, circular businesses, disclose how the fund will be used which will attract investors who prefer a greener portfolio. The method has given advantages to renewable energy financing globally which can be seen in the substantial expansion of Solar power companies across the globe.
- Green Bonds: This is a debt instruments having all the natural features of bonds with some green bonus. Green bonds are issued for finance and refinance green projects. It has some additional costs for tracking and monitoring. However, it also provides benefits on highlighting green assets; creating positive market; expanding lending market; and benefiting relationship between lenders and borrowers.

Microfinance

Also known as microcredit, microfinance evolved as an alternative to traditional banking. This financial service offers loans, savings and insurance to entrepreneurs and small business owners or small projects that cannot afford collaterals. This alternative can also be adapted through web-based P2P Lending. However, although interest rate in microfinance is higher than normal loans and cost of finance tends to be higher, the benefits of essential access to liquidity could outweigh that.

Public-Private-Partnership (PPP)

This is a cooperative arrangement to leverage on a partnership between government and private sectors. Both the sectors join together in ensuring the best in building up strategic public assets and infrastructure. This is especially benefit projects that need huge capital investment, credibility from government is needed. Mostly it is a quite long-term agreement. Appropriate PPP project risks allocation enables to reduce the risk

management expenditures. In case of transition to CE, this kind of cooperative exercise can play a key role.

Conclusion

As mainstream financial instruments presented in this module, each financial method could be adopted suitably in different situation depends on needs and expectations of both circular enterprises and investors on a period of time. It can be seen that even with a number of innovative options given for financing CE projects, challenges are still found in each method. Despite all the challenges, CE seems to be an unavoidable choice with huge potential. Therefore, further development and newer innovative ideas for financing circular projects are still needed to fully propel CE and create more sustainable economy worldwide.

Module 6: Indicators

Overview

In order to efficiently actuate the transition of circular economy, indicators are crucial methods in measuring progressiveness of the projects implemented in relation with the circular economy. This module will various elements that can be included in consideration of the design and development indicators that can be applied to circular economy and different techniques that can be implemented in circular projects according to the nature and objectives of each one.

Content

Why indicators matter?

As circular economy has been adopted progressively by policy makers and a number of relevant stakeholders as part of Sustainable Development Goals (SDGs), measurement on progress of the work towards the transition to circular economy has also become crucial in any scale of every sector. Therefore, indicators come to play its role on this transition. Various definitions have been given by organizations, however, it can be inferred that an indicator is something that helps you understand where you are, which way you are going and how far you are from where you want to be.

A good indicator should be clear and concise. It should focus on a single issue that provides relevant information on a situation and alert before problems occur and gets too bad. It also should help recognize what needs to be done to fix the problem for both current projects and the future ones or, eventually, can benefit effective planning and sound decision-making for the projects/plans. In creating an indicator, suitability can be controlled by using criteria as follows:

- AIMS: Action focused, Important, Measurable, and Simple.
- SMART: Specific, Measurable, Attainable, Relevant, and Time-bound

Types of indicators

- Based on subject of interest:
  - Direct – often the case with operational and technical subjects
  - Indirect – particularly the case with more qualitative subjects
- Types of indicators used in reporting
  - Quantitative indicators
  - Qualitative indicators
  - Mixed indicators
  - Scoring and ranking indicators
  - Simple Yes or No indicators
  - Graphical indicators
  - Framing indicators
- Types of indicators used in logical framework monitoring
  - Input
  - Output
  - Outcome
  - Impact
- Types of indicators used in Result Based Management (RBM)
  - Impact indicators
  - Outcome indicators
  - Output indicators

Indicators of Sustainable Development

Recently, UNEP has advocated *a new indicator for material* consumption, in 2015, which is the amount of materials that are required for final demand (consumption and capital investment) in a country or region (expressed as tones per capita). Another method being used is *a web of interactions among environment, economy and society* (Figure 2.10) which illustrates linkages between various factors dependent on each other.

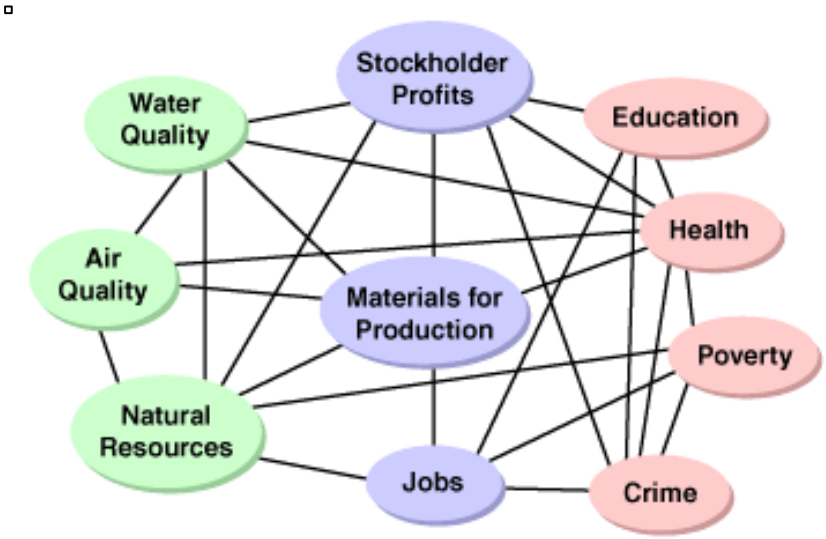


Figure 2.10 A web of interactions among environment, economy and society

According to 17 agenda on SDGs developed by UNDP, the 12th goal specifically addresses the patterns of Sustainable Consumption and Production (SCP) and *eight targets to achieve*. These methods can be inferred as aspects involving in indicators related to sustainable development projects especially SCP which is directly related to Circular Economy.

Indicators of Circular Economy

Micro, meso, macro level indicators

Levels of indicators are classified as to make it easier when addressing particular questions or issues.

- Macro level indicators suit in describing the characteristics of a country or larger region on exchanging of materials between economy and environment, international trade, and material accumulation in national economies in relation to rest of the world.
- Meso level indicators giving a more differentiated tracking of information and more detailed analysis. Not only categories of materials but industries and branches of production and categories of consumption.
- Micro level indicators provide detailed information for specific decision processes at business, local level, specific substance, or individual products.

Circular economy strategies

Ten strategies for circular economy were introduced through a report published by PBL Royal Netherland Embassy consisting of": Refuse, Rethink, Reduce, Re-Use, Repair, Refurbish, Re-manufacture, Repurpose, Recycle, and Recover.

Technology vs Socio-Institutional

Technology-related indicators typically measure 'hard' parameters expressed in volumes (e.g. kg) or environmental impacts. Socio-institutional indicators refer to

governance and infrastructure aspects (e.g. systems in place for sharing, repairing or reusing products).

Indicators in focus

1. Raw Material Consumption (RMC)
2. Material System Analysis (MSA)
3. Expanded Material Flow Meter (MFM+)
4. Leakages from Material Cycle
5. Resource footprint indicator based on Cumulative Exergy Extracted from the Natural Environment (CEENE)
6. Cyclical material use rate
7. Material Circularity Indicator (MCI) & Company Level Circularity Metric
8. End of Life Recycling Input Rate (EOL-RIR)
9. Recycling Rates
10. Recyclability Benefit Rate
11. Recoverability Benefit Rate (Energy)
12. Trade in Secondary Raw Material
13. Waste Generation
14. Waste of Electronics and Electrical Equipment (WEEE) Management
15. Basket of Product Indicators
16. Product Environmental Footprint
17. Private investment, jobs and GVA: recycling sector, repair and reuse sector
18. Resource Productivity
19. Energy and Greenhouse Gas Emissions

Following this part, examples of indicators adopted by China, Japan, Canada, and Netherland are also presented. These case studies and further information in details can be found in the curriculum book as an output of the Activity 2.

Conclusion

As presented above, tools for measuring progress of circular projects can be diverse. There are no strict rules for applying each method, but suitability and right method met with the objectives seem to be more eminent. This is because context and aspects encountered in different geological, environmental and societal could be varied. Therefore, further studies and deep understanding of each tool could help in designing and developing indicators for better contribution to circular economy.

Module 7: Behavioural Change and Communication

Overview

Apart from having solid knowledge and technical skills in CE, soft skills are also crucial to efficiently disseminate messages to all targeted audience and propel changes. This is when behavioural change and communication has come to show its significant role for CE. This module presents a number of alternative actions that can be implemented by individuals, businesses and government. Examples of what have been done shows interrelated similarities occurred in each country in the region which could be adapted and localised to one another.

Content

Sustainable Desires vs Individual Disassociation

It highlights that desires of one person are not necessary reflected how one behaves. People tend to consume by choice, not by need. If it is available, they will use it. If they cannot properly see consequences of consumption themselves, they could endlessly continue consuming energy and resources.

Sustainable Consumption

Basically, human's consumption patterns are led by fundamental human needs requiring such as water, food, and shelter as essential consumption. These materials will also be increase as when the more the income, the higher 'wants' generated inside of one consumer's mind. Another classification of human needs by Max-Neef also is also divided into nice categories eminent 'existential' needs of being, having, doing and interacting. Promotion on offering intrinsic and psychological concept to deal to raise sustainable consumption behaviours are suggested. As well as 'satisfiers' is suggested as response to existential needs.

Consumption trends in Asia

- Overall: 4.2 billion people are urbanizing. GDP/capita 2000-2015 indicates trends in South Asia as doubled and tripled in East Asia and the Pacific. This questions how market can integrate sustainability into the creation of products and services responding to the trends. By 2030, it is predicted that Asia will share 50% of worldwide spending.
- Household debt: The richer people are, the more likely they are in debt resulting to increases of their loans. For Thailand, household debt rose by 13% per year with highest rate of debts at 81% of GDP, mostly to buy cars and consumption goods.
- Footprints: In 2015, Asia accounted for 46 billion tonnes from a consumption point of view and had 81 billion tonnes of global material use. Growth rates of material footprint in Asia Pacific region is still growing at 7% per year.
- Food: A trend from 1990 to 2008 shows a shifting of consumption patterns to a more livestock intensive diet.
- Housing: Fewer people per household as well as more household per person
- Mobility: More personal vehicles according to the trend from 2000 to 2010
- Leisure: Tourism is being demanded throughout Asia region.
- Links to the environment: It is easy to blame factories and industrials directly create pollution and causing resource scarcity, but individual behaviour and consumption patterns are ultimately key drives environmental impact namely – Packaging Dilemma, Notorious Congestion, and Extreme Tourism.

- Impacts: In order to understand impact of your activities, the calculation can be done with an equation presented below:

$$\text{Impacts} = \underbrace{\text{Population}}_{\text{Capita}} \times \underbrace{\text{Affluence}}_{\frac{\text{GDP (\$)}}{\text{Capita}}} \times \underbrace{\text{Wellbeing/ Utility}}_{\frac{\text{Utility}}{\text{GDP (\$)}}} \times \underbrace{\text{Resource Intensity}}_{\frac{\text{Resource}}{\text{Utility}}} \times \underbrace{\text{Eco-intensity}}_{\frac{\text{Impact}}{\text{Resource}}}$$

Figure 2.11 Impact equation

Levels of Behavioral Change

Asian culture is full of different tradition. Some are ingrained in people's mind, bodies and lifestyle. Some could cause low environmental impact especially people in rural area who can long survive on little income. However, modernizing and urbanizing culture can increase materialism and lead to unsustainable ways of living which ultimately damaging the environment. To convince people to join the sustainable act or change their behavior, understanding people in different groups can be separated as:

Individual Change

In order to initiate the ripple of change, we must carefully navigate how to approach modification of long-standing behaviours that have become a way of life. According to Transtheoretical Model of Behaviour Change, it notes that change takes time, therefore, six phases of the behavioural change process are introduced:

- Precontemplation ("not ready") – Unaware of problematic behaviour
- Contemplation ("getting ready") – Beginning to recognize problematic behaviour
- Preparation ("ready") – Intending to act in the immediate future through small steps
- Action – Making specific modifications to their problem behaviour or taking on new healthy behaviours
- Maintenance –Having been able to sustain action for at least six months
- Termination – Having zero temptation and they are sure they will not return to old ways

In this section, Max-Neef's framework is also used to comprehend needs, satisfiers and value change; and adopt the concept of Dragons of Inaction to explain why people who realize change is needed but cannot implement it themselves.

Organizational Change

Organisations can be great agencies of society that shape public values, knowledge and skills acquisition and often have great influence over individuals and small groups i.e. School and Education and Community Groups.

- Sustainable Public Procurement
  Governments are big consumers, spending between 15-45% of GDP. Public procurement is governed by procurement policy. With little policy change, government can lead by example and practice sustainable procurement to send market signals that they are encouraging accessible and affordable sustainable products.

- Sustainable Business Models
  - Household Energy: Opower, a business based on behavioral change on energy uses comparable with other customers and provide actionable information to reduce energy consumption. It is expected to arrive in ASEAN countries soon.
  - Mobility: Most of the application launched are bike sharing services available in each local area namely: Zoom car and Zap, Olive trips, Mobike, Ofo, MyByk, NammaCycle and Pun pun.
  - Fashion: The world's largest sustainable fashion design competition called 'EcoChic Design Award' which most of alumni is from Asia. Many sharing programmes has been launched around Asia both people-to-people (P2P) and Business-to-people (B2P) platform. Products are range from clothes, bags, jewelry, toy, camera, furniture and medical equipment.
  - Repair Business: iFixit is an app and website providing links and manuals and youtube videos for repairing a broad range of stuff. Some apps are focusing connecting technicians to fix any problems at home such as HandyHome, HouseJoy and Jeeves. Some apps focus only fashion products named Momoko Bag & Shoes Spa.
  - Waste Prevention and Recycling Support: Samples are Yingchuang Recycling providing offline and online recycle platform; Aihuishou focusing on electronics recycling.
  - Plastic bag bans: This action is push by the government differently in each country.
  - Finance: Financial organizations try to make people more aware of sustainable lifestyles, some products are created such as Green Credit Card in Korea providing economic incentives to green-conscious consumers and Live Green, Shop Green Campaign in China. Alipay's social mobile game Ant Forest is a game recording player's behavior and calculate carbon emission relating to digital tree's growth. A completion one digital tree will lead to planting a genuine tree every time a digital tree was grown. Another option is crowdfunding platform, the popular ones related to sustainable projects are Wishberry and Spark the Rise.
- Sustainability Reporting
  Sustainability reporting is an organisation's practice of reporting publicly on its economic, environmental, and social impacts. The trick is making sure that the reporting is unbiased. I can be a powerful motivator for sustainability change, if done well. A pioneered international organization on sustainability reporting is Global Reporting Initiative (GRI).

Public Policy Change

According to A framework for shaping sustainable lifestyles – determinants and strategies (UN Environment, 2016) and Sustainable consumption guide for policy makers: Debunking myths and outlining solutions (Asia Edition) (UN Environment, 2015), numbers of policy instruments for Sustainable Lifestyles were introduced namely:

- Product related policies: banning of worst products, performance standardisation, provision of product information at point of purchase, product testing by third party and certification of eco-labels
- Business related policies: supporting businesses in shifting from selling physical products to selling services, giving tax incentives or other support for social enterprise or businesses with repair and reuse services

- Policy approaches: integrating sustainable consumption into high level policies, providing training for government officials and businesses related to the topic, establishing a coordinating body on sustainable consumption, actively involving stakeholders, improving public information about sustainable consumption, and including sustainable criteria in procurement of government
- Using economic measures to shape consumption: taxes on natural resources and pollution, subsidies on sustainable products, full-cost pricing (including environmental cost) and use charges, elimination or reduction of environmentally harmful subsidies, and deposit-refund schemes
- Distribution and Retail: supporting businesses who are practicing 'choice editing', 'localising' and 'consumer co-ops'
- Advertising: restricting the amount and some types of advertising including using tax control on advertising
- Shifting the social context around consumer behaviour: make more sustainable choice the default option, provide actionable information and tools, reward and highlight sustainable behaviour, and encourage community collaboration over individual participation

Myths on economic growth: One barrier for change is the misperception that more sustainable consumption is bad for business and economy.
Societal Values: This method is used to dictate what development path is chosen by governments and there is a case to be made for societies to rethink how they want their economies to grow. The method divided into 4 groups are Copy Cat (Business as usual), Piggy back (Fine Turning), Leap frog (Transforming), and Horse Jump (Game changing).

Mechanisms for Behavioural Change

- Nudging: nudging or using 'choice architecture' can help push consumers in the right direction towards sustainable actions and consumption. Common methods are –
  - Setting the proposed option as the default
  - Using social norms to inform people of less sustainable behaviour
  - Changing the physical environment
- Religion: 65% of the world population follow a religion. It can shape and influence laws, education systems, holidays, and as a result – can fundamentally shape cultures
- Media: Media is the gatekeeper to our news, culture and trends. It not only report on but also shapes our views.
- Advertising and Marketing: It is famous for driving consumption but can also persuade audiences to consume less or differently.
- Developing Campaigns: Organizations should consider a systematic plan to craft their advertising, marketing and communications campaigns. This can be done through simple steps expressly:
  1. *Purpose:* A clear reason for WHY could save you a lot of time to go through work spending in the office or figuring something out. Use the concept of purpose driven storytelling.
  2. *Audience Mapping:* who is the first person you want to reach with the message. The search of information for making audience mapping might takes time but will give us the better idea of what people could possibly be Impacted by the project. The mapping could begin with demographics details: Age/Gender, Race, Location and Employment

status. Then, try to fill in their psychographics information: Personality, Values, Attitudes, Interests and Lifestyles.

3. *Landscape Analysis:* to see what makes you unique and different, filling in relative information on all four sides of the diagram so that you will not miss any emotional and rational factors that could affect your decision making for the communication strategy.
4. *Creative Platform:* need a creative platform that can communicate to targeted audience

Conclusion

Since the regional roadmap has marked goals on sustainable lifestyle and education, many practices have been introduced to the market and on the process of transition to CE. Although many innovative circular products, services and polices have been introduced in Asia, the process towards communication success especially comprehension of the targeted audience could be very challenging to efficiently implant sustainable lifestyle into the society and support government in reaching the optimum potential of high-level policies leading other related practices that will lead everyone to become more sustainable and willingly change themselves towards CE.

ACTIVITY 3: ONLINE AND OFFLINE COURSE DEVELOPMENT

Online and offline course

Together with the curricula package, 'Asian Circular Economy for Tertiary Education', is created in the 2nd Activity, self-paced online courses are also developed to support newcomers, or as a refresher for involved stakeholders on Sustainable Consumption and Production (SCP) through Circular Economy. The self-paced courses on Asian Circular Economy will be, as well, played as an optional streamlined version of the curricula developed for the SCP Academy and tertiary education. These courses are instructed in English language which can be accessed by anyone who has interest and ability in using English to learn on their own from any part of the world.

As a result of creating online and offline course for self-paced education, two platforms of knowledge sharing are chosen below:

UNIQUIZZ

Uniquizz is a mobile application connecting the existing knowledge and processes through smartphones. The application can play the role on enabling education with linkage to the courses taken by one or a group of people with no limitation on location and time, for this reason, Uniquizz seems to be a well-fit option for emerging topic highly needed in promotion worldwide like Asian Circular Economy.

During the 'Asian Circular Economy Leadership Academy' (Activity 4), Uniquizz had played its role on providing materials, quizzes, and comprehensive content of each module to the participants. This platform enables participants to study available materials before entering classes, also revise the content back and forth on their own time as much as they wish. Additional links and case studies are also given as practical case studies which can be adopted in their home country.

After the academy, participants can still have access to materials and content on Uniquizz. Additional content and case studies can still be added to the course. Moreover, this platform is planned to open access for public interest coming from any sectors. This platform could be become a potential platform in organizing trainings or workshops related to circular economy. Also, it is expected to benefit influencers who can motivate their own organizations or communities to change and adopt the transition concept to circular economy, and finally implant sustainable consumption and production mindset to people worldwide, especially in Asia-Pacific region.

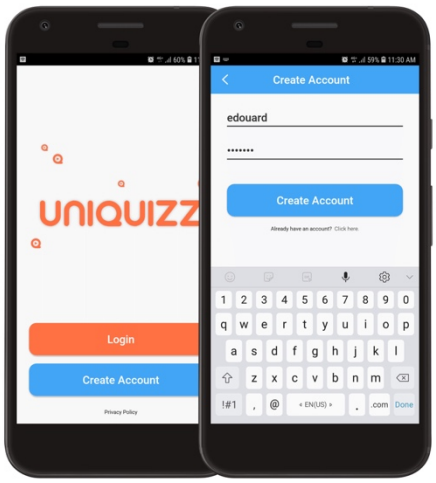
To access Asian Circular Economy course on Uniquizz, it can be done by following a guideline presented below:

User guide for Uniquizz Application

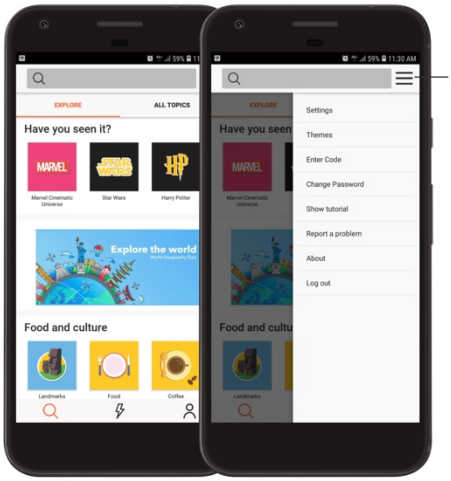
You can download the application easily on your smartphone from Google Play Store or Apple App Store, or, alternatively scan the QR Code on the right.

Connect to the Asian Circular Economy Online Course

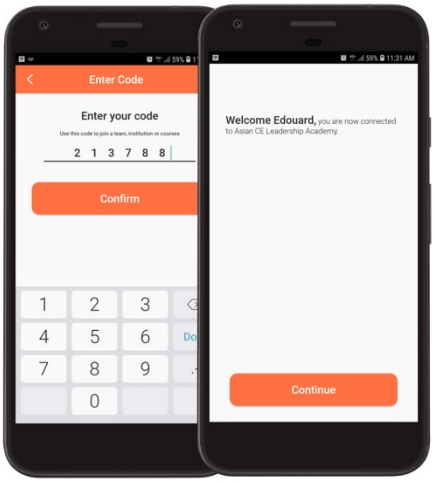
1 Open Uniquizz and tap **Create Account**. Type in a username and a password.



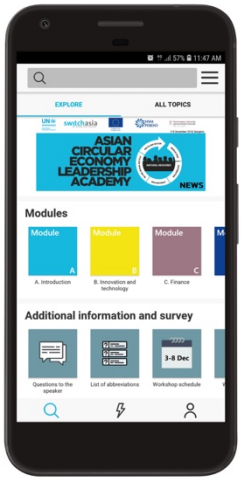
2 Tap ☰ in the top right corner to access settings. Click **Enter Code**



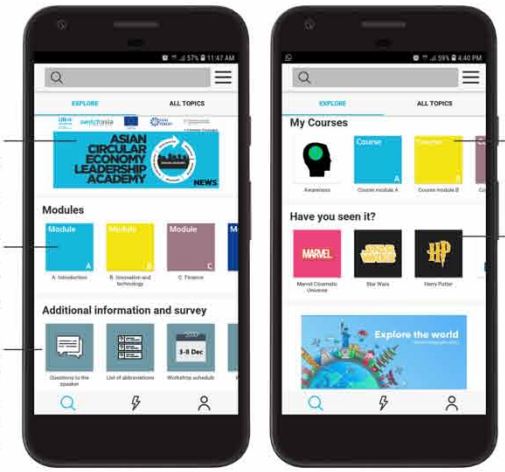
3 To access content, you need a code. Enter **213788** and click confirm.



4 Now, you are connected to the **Asian Circular Economy Online Course!**



Discover the Asian Circular Economy Online Course



Featured topic. The top image displays recent news from the course.

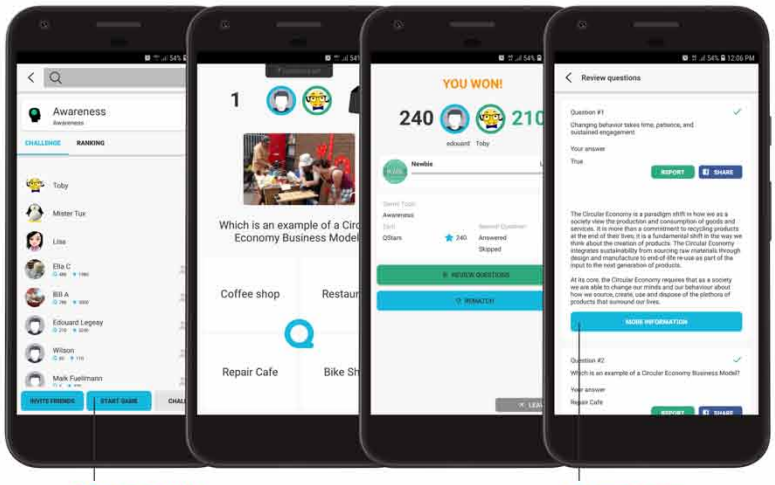
Learning materials. Find all the information you need for each module.

Additional topics. Ask questions from the facilitators. Answer surveys, or find information about the course.

Courses. Access all training materials related to each module.

Fun quizzes. Take a break and have a look at fun topics.

Play quizzes, Challenge your friends, and Access more learning material



Start a quiz. Just click to begin a new quiz. Easy!

Learn more. The short description explains why this is the correct answer. Click more information to access interactive media about the question.

CHULA URL

Today, e-learning has almost disrupted the traditional education sector, and have gone way ahead than wherewithal. A self-paced system enables learners to make study progress at their own pace with rhythm that suits them most. Whenever network connectivity is available, learners can learn from the website directly; otherwise they can download the curriculum package and then engage in self-paced offline learning at their time convenience.

Everyone has the right to learn and embraces lifelong-learning in order to develop their thoughtfulness, competence, and intelligence throughout each stage of life. The Chula URL platform creates a space where learners, from any ages or professions, can access to the online or offline course or self-paced system. The Asian Circular Economy for Tertiary Education uses http://asiancircular.chula.ac.th as an education platform. Review questions, critical thinking questions, quizzes, and additional readings can be self-paced for 7 modules. Presentations from the training workshop are included in the website.

In the long run, this curriculum can be transferred to a full online education that offers certificate upon completion. Under the credit system, the credits can be accumulated while studying for other SCP courses. The online education will be a crucial step forward in the reformation of higher education not only on circular economy, but the entire SCP strategic umbrella.

ACTIVITY 4: IMPLEMENTATION OF SCP ACADEMY

Overview

Asian Circular Economy Leadership Academy, as a SCP academy, is a prestigious in person training program for young professional in Asia from government, business and civil society. It is an interactive problem-based learning training event that generates co-benefits compared to online training, such as network and trust building, one to one development of SCP proposals, and also enables us to reach stakeholders not usually engaged in SCP such as Ministries of Planning, private sector professionals or influential NGOs. The overview of this activity includes:

Consumption patterns are changing rapidly in the Asia-Pacific region. While this has been an economic growth success story, it has come at an environmental cost: high resource use, fast growing greenhouse gas emissions, and rising amounts of plastic waste.

We can do better by bringing a better quality of life while minimizing environmental impacts from using too much of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of future generations.

Policy makers, businessman including innovative technologies inventors need to be well-understood challenges facing the region, especially in their local area, in order to efficiently create and propel changes on consumption behaviour and lifestyle both on individual consumers and from dominant public and private sectors.

Exchanging ideas through case studies from similar context of each country has given a good ignition of ideas for further development and adaptation to one another's on-going projects. Together, this has built up a network for moving towards more sustainable lifestyle as a regional level.

This event is a one-week event **funded by the European Union's SWITCH-Asia Regional Policy Advocacy** which is scheduled to be conducted by UN Environment and the Center of Excellence on Hazardous Substance Management (HSM), Chulalongkorn University. This is created as the fourth activity under 'Strengthening resource efficiency and sustainable consumption and production policy frameworks in Asia Pacific project'.

Key Messages

Why Circular Economy?

Consumption patterns are changing rapidly in the Asia-Pacific region. While this has been an economic growth success story, it has come at an environmental cost: high resource use, fast growing greenhouse gas emissions, and rising amounts of plastic waste. Living in the era of consumerism that encourages the purchase of goods and services in ever-greater amounts has led to unsustainable consumption and production patterns, hence leading to the resource scarcity and waste and pollution problems. Only resource efficient, cleaner and safer production, and sustainable consumption can address a broader spectrum of the Sustainable Development by responding to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of future generations. Sustainable consumption and production (SCP) aims at "doing better with less." SCP is a holistic approach to minimizing the negative environmental impacts from consumption and production systems while promoting quality of life for all. This holistic nature of SCP hence complements resource efficiency by reducing resource use, degradation and pollution along the whole lifecycle, utilizing waste as resources, and hence moving towards Circular Economy (CE).

Asian Circular Economy Leadership Academy

The Asian Circular Economy Leadership Academy aims to improve the knowledge of young professionals from public sector, private sector and civil society organizations who can contribute to the design and implementation of innovative solutions for policies, business models, technologies, financing mechanisms and practices that promote sustainable consumption and production for climate change, energy efficiency, waste management and poverty alleviation. It is supported under the EU funded SWITCH-Asia Regional Policy Advocacy Component.

Background of Asian Circular Economy Leadership Academy

For SCP to be realized, it is important to involve all stakeholders such as policy makers, industries, researchers and more importantly the entire supply chain involving producers (business) to final consumers, among others. Engaging these stakeholders is possible through awareness-raising and education on CE. This approach goes hand in hand, and requires joint efforts of different stakeholders for its full realization. Thus, the producers and manufacturers need to understand and avail the technologies, practices, and approaches that lead to resource efficient, cleaner and safer production. Similarly, the consumers need to learn how to make sustainable lifestyle choices, consuming better and more responsibly. In addition, the policy makers need to facilitate the CE through enabling policy environment integrating both production and consumption initiatives. Researchers need to contribute towards scientific, technological and innovative capacities to move towards more sustainable patterns. Therefore, educating these different state and non-state actors on various aspects of CE through training, and formal education is essential. With this perspective, Asian Circular Economy Leadership Academy was created to initiate and promote interest of CE in the Asia-Pacific in all sector which could be a path leading to SCP practice in the region.

The key messages from the 'Asian Circular Economy Leadership Academy' include:

Introduction

- The linear 'take, make, dispose' economic model relies on large quantities of materials and energy that are cheap and can easily accessible.
- The CE is an attractive and viable alternative that is restorative or regenerative by intention and design.
- CE has three key principles on preserving and enhance natural capital; optimize resource yields; and foster system effectiveness

Innovation and Technology

- Conventional Innovation traditionally design for systems to source, produce, sell, and use their products or services, making them cheaper to make, easier to sell, or better to use, while sustainable innovation is defined as innovation that leads to greater profits, better social outcomes and less environmental damage.
- When the sustainability principles are combined with the design thinking methodology can have more impact towards promoting and achieving sustainability.

Finance

- As consumers fail to anticipate the value of the product in further cycles, more favour in leasing service spread out in many kinds of product and service.
- Green Finance is any financial instrument and investment issued and done in exchange for verifiably positive environmental impact
- More innovative ideas for green projects are still needed since current technologies are still faces some challenges restrain green financing.

Policies

- Over 350 Multilateral Environmental Agreements (MEAs) relevant to Sustainable Consumption and Production, and Circular Economy have been highlighted to guide and shape the way policies could be designed to promote more actions on sustainable lifestyles applicable to each country.

Business Models

- Three important potential of CE are resource optimization, building and sustaining brand value, and selling to a market of consumers ready to buy CE products and services.
- 5R principles of CE includes reduce, reuse, recycle, redesign, and rethink.
- The paradigm of CSR is changing for CE.

Behavioural Change and Communication

- Sustainability mindset should be integrated into increasing trends of populations, consumption and urbanizing.
- For Asia-Pacific region, Regional roadmap on SCP (2017-2018) on Sustainable Lifestyle and Education chapter is a regional guideline leading affiliated countries.
- Despite the trends, fundamental needs of human and myths about the misperception on sustainable consumption of people are what propelling market at the moment. Therefore, better understanding and more innovative way of communication are needed.

Programme at a Glance

'Asian Circular Economy Leadership Academy' is a one-week event funded by the European Union's SWITCH-Asia Regional Policy Advocacy which is scheduled to be conducted by UN Environment and the Center of Excellence on Hazardous Substance Management (HSM), Chulalongkorn University. The programme was held during 3rd – 8th December 2018 at Chulalongkorn University, Thailand.

This interactive problem-based learning training event is created as the fourth activity under *'Strengthening resource efficiency and sustainable consumption and production policy frameworks in Asia Pacific project'.* The aim of this academy is bringing young professionals from government, business, civil society including influential NGOs especially stakeholders who are not usually engaged in Sustainable Consumption and Production (SCP) to build a co-benefit environment for learning comparing with online training which can create a network, trust building and one to one development proposals related to SCP by using Circular Economy as a mechanism leading them to the understanding and implementation of the projects in compromise with the SCP concept.

About SWITH-Asia

SWITCH-Asia II Regional Policy Advocacy aims to strengthen the dialogue at regional, sub-regional and national policies on Sustainable Consumption and Production in selected Asian countries, thereby contributing to green growth and poverty reduction.

About United Nations Environment Programme (UN Environment)

UN Environment is the leading global voice on the environment. It provides leadership and encourages partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations. UN Environment works with governments, the private sector, civil society and with other UN entities and international organizations across the world. UN Environment is holding this event under the EU-funded SWITCH-Asia programme.

About Center of excellence on Hazardous Substance Management (HSM), Chulalongkorn University

The Center has been in operation as a consortium of renowned universities both in Thailand and from overseas under supervision of the Science and Technology Postgraduate Education and Research Development Office (PERDO), Office of the Higher Education Commission (OHEC). Activities of HSM encompass research, human resource development programs and academic consultation.

HSM's directions and foci cover from pollution prevention, right through to treatment, remediation and public outreach. The Center thrives on building and maintaining fruitful collaborations with the industry, government offices, overseas universities and international organizations. The common goal is to drive multidisciplinary research to excellence with the aims to move the country and the region forward towards sustainable growth amidst various challenges.

Programme Schedule

	Monday 03/12/18	Tuesday 04/12/18	Wednesday 05/12/18	Thursday 06/12/18	Friday 07/12/18	Saturday 08/12/18
8.30-9.00am			Module B: Innovation and Technology			
9.00-9.15am		Module A: Introduction to Circular Economy		Morning Quiz	Morning Quiz	Morning Quiz
9.15-10.45am				Module C: Finance	Module D: Policies	Module F: Behavioural Change and Communication
10.45-11.00am			Q&A		Q&A	
11.00-11.15am		Break	Break	Break	Break	Break
11.15am-12.10pm		Module A: Introduction to Circular Economy	Module B: Innovation and Technology	Module C: Finance	Task	Module F: Behavioural Change and Communication
12.10-12.30pm			Morning Quiz	Q&A		
12.30-1.30pm		Lunch	Lunch	Lunch	Lunch	Lunch
1.30-3.10pm		Module A: Introduction to Circular Economy	Task	Task	Module E: Business Models	Module F: Behavioural Change and Communication
3.10-3.30pm		Q&A			Q&A	
3.30-3.45pm		Break	Break	Break	Break	Break
3.45-4.40pm		Module A: Introduction to Circular Economy	Discussion	Discussion	Task	Debate
4.40-5.00pm						Individual Reflection
5.00-5.30pm						Certification Ceremony
5.30-7.30pm	Welcome Dinner					

Welcoming Dinner

Monday 3rd December 2018

To officially welcome all 34 participants from 20 countries and mark the opening of the first workshop promoting circular economy concept in the Asia-Pacific region level, distinguished guests are invited to join this session to meet all the participants, giving their speech and be an honour to the programme.

"Apparently, the shift is needed in most developed and developing countries towards Circular Economy, I think this is something that is new and it is also a new approach to development. This is a very good opportunity for you all to actually train this now because it is a future and there will be a lot of needs for competent people to implement projects, programmes and policies in this area in your respective countries."

Mr Jérôme PONS
Head of Cooperation
Delegation of the European Union to Thailand

"Circular Economy is basically closing the loop, as local as possible, by increasing the efficiency and reducing the pollution. As we have been saying that what goes around comes around, in this circularity, all the good deeds and actions regenerate other good deeds, actions and so on. This is very interesting that how we can make profits out of this new business, which is a good deed. Or how we can make other persons not to use plastic at first, use alternative instead, also a good deed. This creates more jobs, more impacts…that is how I see what Circular Economy is."

Mr. Mushtaq Ahmed Memon, Ph.D.
Regional Coordinator for Resource Efficiency
UN Environment, Asia Pacific Regional Office

"What is needed and urgently needed is a local large scale delivery for truly transforming the impacts. And the lead to successful aforementioned delivery is leadership. Leadership that empowers other stakeholders and others, engages concerns' stakeholders, influences and induces appropriate actions, supports innovations including eco-innovations and alternatives, and finally acts in a transparent manner with ethical communication and high sense of responsibility."

Mr. Arab Hoballah
Team Leader
SWITCH-Asia SCP Facility

"This workshop is not only strengthening participants' knowledge and friendship but also enhancing their leadership skill that can improve the lives of others and benefit the greater good, making this world a better place."

Associate Professor Vithaya Kulsomboon, Ph.D.
Assistant to the President for Research
Development and Innovation Chulalongkorn University

Module A: Introduction to Circular Economy

Tuesday 4th December 2018

"Not all Circular Economy loops are equal! Inner loops at the consumption end of the supply chain (repair, share) are higher value than outer loops at the materials end (recycling)"

Ms. Janet Salem
Program Manager
Sustainable Consumption and Production
UN Environment Programme

Key Messages

This module introduces the core concepts of the circular economy, which can be an alternative to the linear economic model that is widespread across the globe. It discusses how the circular economy might be contributed to reduce natural resource consumption and environmental impacts, and why it is important for countries to consider transitioning to the circular economy.

Why should we focus on Circular Economy?

The linear 'take, make, dispose' economic model relies on large quantities of materials and energy that are cheap and can easily accessible. Sadly, they are now reaching their limits. The circular economy is an attractive and viable alternative that is restorative or regenerative by intention and design. With the adoption of circular economy, unlimited resources take on a more central role in economic processes, and resources that are limited by natural supply play more of a supporting role.

Natural Resources

Throughout its evolution and diversification, our industrial economy has hardly moved beyond the early days of industrialisation: a linear model of resource consumption that follows a 'take-make- dispose' pattern. Companies harvest and extract materials from natural resources, use them to manufacture a product, and sell the product to a consumer, who then discards it when it no longer serves its purpose. The use of materials from natural resources in production and leftovers from consumption processes have many environmental, economic and social consequences that extend beyond borders and affect future generations.

What is DPSIR framework?

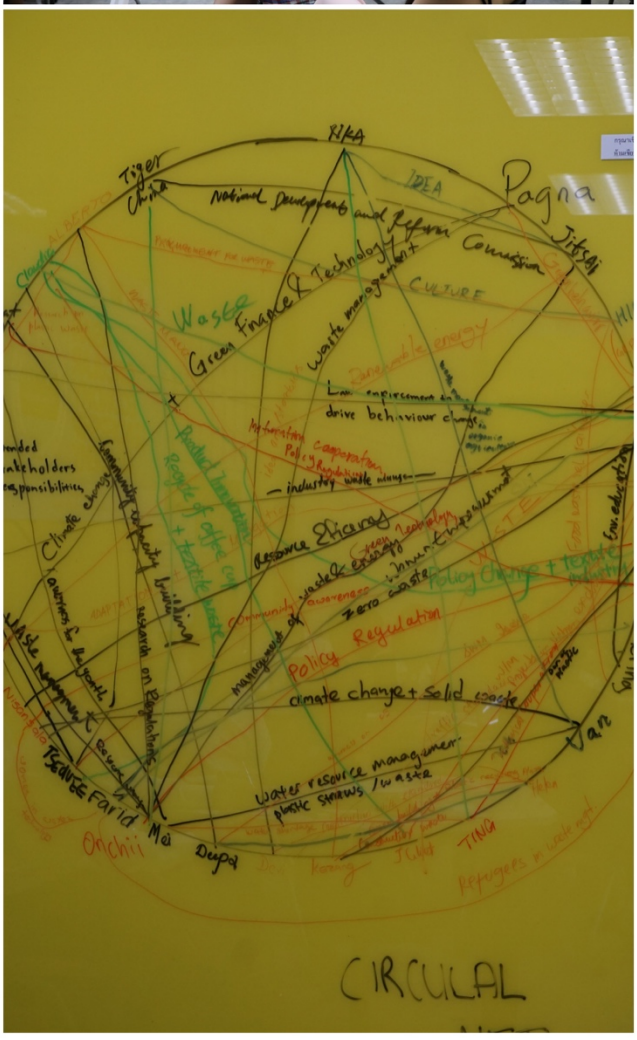
According to the DPSIR framework, there is a chain of causal links starting with 'driving forces' (economic sectors, human activities) through 'pressures' (emissions, waste) to 'states' (physical, chemical and biological) and 'impacts' on ecosystems, human health and functions, eventually leading to political 'responses' (prioritisation, target setting, indicators). Describing the causal chain from driving forces to impacts and responses is a complex task and tends to be broken down into sub-tasks, e.g. by considering the pressure-state relationship.

Circular Economy Concepts

A circular economy is an industrial system that is restorative or regenerative by intention and design. It replaces the 'end-of-life' concept with restoration, shifts towards the use

of renewable energy, eliminates the use of toxic chemicals, which impair reuse, and aims for the elimination of waste through the superior design of materials, products, systems, and, within this, business models. The circular economy rests on three key principles:

- Preserve and enhance natural capital
- Optimise resource yields
- Foster system effectiveness



Module B: Innovation and Technology

Wednesday 5th December 2018

"You need to align innovation technology to help achieve Circular Economy."

Prof. Dr. Shun Fung Chiu (Anthony)
De La Salle University, Manila, Philippines

"Circular Economy is the engine that drives innovation to be more human centric and beneficial for better the planet."

Mr. Maik Fuellman
TRIS Corporation Limited

Key Messages

This module describes the differences of the conventional vs innovation in the current technological advances and its impact in circular economy and sustainable development, key innovative technologies and the importance of data in the achievement of circular economy and sustainable development. It is also explaining how the design thinking can be a methodology towards sustainable problem solving. The contents in this module are summarized below.

Innovation in CE

Conventional and Innovation

- Conventional and Innovative Solutions
  Conventional Solution refers to the traditional linear economy of take – make and dispose. In contrast, innovative solution refers to the transition from linear economy to a circular economy.
- Conventional and Sustainable Innovations
  Conventional Innovation traditionally design for systems to source, produce, sell, and use their products or services, making them cheaper to make, easier to sell, or better to use, while sustainable Innovation is defined as innovation that leads to greater profits, better social outcomes and less environmental damage.

Roles of Innovation

- Collaborate businesses and researchers
- Bring together groups of people
- Connect people to fast-track innovation
- Encourage collaborative learning tactics

Innovative Technology

The rise of sophisticated hardware and software is changing the way the world lives, plays, and works; and Asia Pacific is no exception to its outsize influence. Some of the key technologies and trends expanding the influence on society are:

- Big Data
- Internet of Things (IoT)
- Blockchain
- Artificial Intelligence

Achieving CE through Data Utilization

How important is data in achieving CE?

CE have been taking in various forms within the industries, policies, and academe. In order to tell it has already been achieved, this is when the importance of data comes in the picture. Data, after being collected, analysed, and integrated can highlight specific areas that need more urgent attention due to the fact that perhaps either few data is related to it or most of the data gathered signifies that no progress happened.

Sources of Data

- Primary Sources
  - Original researches
  - Survey data e.g. economic statistics
  - Reports by observers/data collectors
  - Self-collected data
- Secondary Sources
  - Reports from economic sources; e.g. banks
  - Government sources
  - Corporate filings e.g. annual reports
  - Medias
  - NGO data collection initiatives

Design Thinking: A Methodology Towards Sustainable Problem Solving

- Design thinking and sustainability
  Design thinking is a methodology for innovation that combines creative and analytical approaches and requires collaboration across disciplines. When the sustainability principles are combined with the design thinking methodology can have more impact towards promoting and achieving sustainability.
- Design thinking methodology
  Design thinking uses designer's sensibility and methods for problem solving to meet people's needs in terms of technological feasibility and economic viability. The methodology brings a process towards building sustainable systems, services and products.
- Broader principles of design thinking
  - Human-centred approach
  - Research-based
  - Looking at a broader contextual view
  - Collaborative and multi-disciplinary
  - Iterative deliveries and prototyping


Design thinking is a process for creative problem solving
switchasia
ASIAN CIRCULAR ECONOMY LEADERSHIP ACADEMY
ASIAN CIRCULAR ECONOMY LEADERSHIP ACADEMY
switchasia
ASIAN CIRCULAR

Module C: Finance

Thursday 6th December 2018

"Raising finance and utilizing it for accelerating the cause of world circular economy to grow are very crucial today since the future of our planet largely depends on Circular Economy success"

Prof. Dr. Manipadma Datta
TERI School of Advanced Studies, New Delhi, India

Key Messages

Since a transition from linear to circular economy involves changing business models, views on investment and financial management are also crucial to enable the transition and run projects smoothly. Especially for circular economy, long-term capital requirement and risks are needed to be understood by investors. This leads to high demand on innovative mechanism to mobilize the capital for circular economy. The module will introduce appropriate sources and instruments to support financing in circular economy projects.

What is Traditional Financing?

Public and Multilateral

- Bank financing: Cash-flow based loan would be more suitable than collaterals since the uncertainty in the demand for circular products as consumers fail to anticipate the value of the product in further cycles; more favour in leasing service with more predictability.
- Multilateral Development Bank (MDBs): Cheaper finance from MDBs is very much needed to provide support system to the developing nations help them build up resilience to worsening climate impacts.

Private

Social Impact Bonds (SIB) remains a choice to explore, as well as a stable momentum on generating Impact Investors who could play a significant role in circular economy finance (CEF).

Emerging Avenues of Financing

Crowdsourcing: It could be immensely useful for circular economy by offering lower transaction costs, enhance convenience for end users and increase access to credit and investments for underserved segments of the populations and businesses, but not yet much regulated in this area.

Venture Capital (VC): Intend to provide long-term finance to start-ups and small businesses that are believed to have long-term growth potential or high-potential high-risk projects.

Peer-to-Peer (P2P): Act as an intermediary in matching lenders with borrowers; could be low cost transaction, low interest rate, and overall cheaper borrowing than other methods depending on negotiating process.

Initial Coin Offering (ICO): a blockchain based offering crypto currency to raise fund with greater transparency, immutability, consensus-building and traceability; but still unstable regulations in each country.

Innovative Approaches

Green Finance: Any financial instrument and investment issued and done in exchange for verifiably positive environmental impact

- Green Equity – done through circular businesses attract investors interested in greener portfolio by disclosing how the fund will be used
- Green Bonds – issued for finance and refinance green projects. It has some additional costs for tracking and monitoring, however giving benefit as follows.
  - Highlighting green assets
  - Creating positive market
  - Expanding lending market
  - Benefiting lender-borrower relationship

Microfinance: Although interest rate in microfinance is higher than normal loans and cost of finance tends to be higher, the benefits of essential access to liquidity and collaterals-free could outweigh that.

Public-Private-Partnership (PPP): This is a joint between government and private sectors in ensuring the best in building up strategic public assets and infrastructure, especially projects that need huge capital investment and high credibility.

Module D: Policies

Friday 7th December 2018

"A good circular economy is usually a good integration of technologies, business, and policies. Policy-makers can be more active in this integration and synthesis approach"

Assoc. Prof. Dr. Tao Wang
Tongji University, China

Key Messages

This module provides a synthesis of circular economy policies mainly in Asia-Pacific. The learners will get to know cycle of policy; current status of circular economy policies; and explore policies in different levels from international, national including its drivers and evolution. Case studies are also presented from the leading countries showing how they construct and promote circular economy plans and practices.

How policies are created?

A typical policy cycle involves the following processes:

1. Problem Identification
2. Policy framing
3. Policy Implementation
4. Monitoring & Evaluation

Considering types of policies, for circular economy, relevant policies that should be considered are as follows:

- Circular Economy in Five-Year Plans
- Laws and regulations
- Standards
- Tax
- Full cost pricing
- Incentives
- Extended producer responsibility (EPR)
- Green Procurement

International and regional policies

Since an initiation of SDGs by UN, a number of related international laws based on treaties applicable to countries and over 350 Multilateral Environmental Agreements (MEAs) relevant to Sustainable Consumption and Production, and Circular Economy have been highlighted to guide and shape the way policies could be designed to promote more actions on sustainable lifestyles. For Europe, 'EU Action Plan for the Circular Economy' was enacted since 2015, following with many related bodies. While Asia-Pacific, several collaborative platforms and dialogues have been created and localized to each area.

National policies in Asia-Pacific

Sound Material-Cycle Society (SMCS) in Japan: This was defined by the Basic Act on Establishing SMCS in 2000. SMCS covers, namely:

- International Resource Circulation - A system aims to create resource efficient society by contributing their know-how with many different countries on high-quality environmental infrastructures.
- Act on Green Procurement – An act enacted in 2000 for public authorities to follow including basic guidelines and a list of designated procurement for works, goods and services.
- Eco-towns - 26 eco-towns were approved in 1997-2005 with the objectives of creating integrated waste management sites and reviving local industries through innovative recycling development.

Circular Economy in China: Since 2005: circular economy division was established in National Development and Reform Commission (NDRC). Then in 2009, Circular Economy Promotion Law was enacted including the term 'Circular Economy' following with other related plans, namely:

- Circular Transformation of Industrial Parks - on spatial planning, industrial chains, efficient resource utilization, centralized pollutant disposal, green infrastructure, and advanced management.
- Resource Recycling Base - identify specific industrial parks/zones to handle urban waste and recover recyclable resources.
- WEEE Fund - According to this instrument, formal dismantling and recycling of WEEE had increased to nearly 50% by 2015. However, there are still some challenges since 90% of the fund is from governmental budget and it takes over than a year to receive the fund.

Module E: Business Models

Friday 7th December 2018

"The Business Case for Circular Economy is real and can create mutual benefits for business and society. It requires top management commitment, focus on emerging opportunities, and partnerships among stakeholders for a systemic change."

Asst. Prof. Dr. Ritika Mahajan
TERI School of Advanced Studies, New Delhi, India

Key Messages

This module provides insights into the principles, strategies and applications of circular economy through innovative business models. It describes the fundamental 5R principles, , five different innovative models and associated challenges for the business case for CE. It also demonstrates the changing paradigm of corporate social responsibility (CSR) and the associated opportunity of leveraging CSR for circular economy. The contents in this module are summarized below.

The business case for CE

Three important areas where the potential of CE is very promising and makes a lot of business sense are

- resource optimization through 'recycle, re-use, reduce, redesign and rethink' strategies in business processes and supply chains,
- building and sustaining brand value through stakeholder engagement and support including fulfilling regulatory requirements, and
- selling to a market of consumers ready to buy CE products and services.

5R principles

The circular economy is mostly defined as a combination of reduce, reuse and recycle activities, and often it is not highlighted that "CE necessitates a systemic shift".

- Reduce: It is the process of converting waste material into new products/materials for various uses.
- Reuse: The principle of reduction is based on a careful analysis of current policies and practices for running the business, as well as adopting innovative methods for optimally utilizing resources.
- Recycle: The Reuse principle is based on imagination and inspiration for re-using products. Reuse initiatives help save cost and increase span of investment by increasing the life of products.
- Redesign: This principle entails an endeavour for CE that's restorative and regenerative through redesigning products, polices and business models.
- Rethink: The principle of 'Rethink' for circular economy strives for creative thinking in organizations and implementing the creative thinking through innovations that change the 'business as usual' scenario.

Innovative business models

There are companies that have already started working on the principles of CE. These companies form a group of innovative business models for CE. These models can be divided into five categories as follows:

- Resource Recovery
- Sharing Platform
- Product Life extension
- Product as service
- Circular supplies

The changing paradigm of CSR for CE

The literal meaning of CSR is that business should be responsible for contributing to the society. The foundation of CSR for CE is to be supported by three pillars. First is the commitment to ethical and legal compliance. Second is the implementation of business ideas which align interests of business and society. Third is a set of basic requirements for achieving the first two.

Module F: Behavioural Change and Communication

Saturday 8th December 2018

"Creating the circular economy starts with one person. Knowing your audience inside and out is critical in communicating your purpose with impact."

Mr. Jacob Holder
The Mobius Agency

"We need training for governments and businesses on sustainable consumption because they usually know best how to translate these things into action in their own sphere."

Ms. Janet Salem
Sustainable Consumption and Production
UN Environment Programme

Key Messages

Apart from having solid knowledge and technical skills in circular economy, soft skills are also crucial to efficiently disseminate messages to all targeted audience and propel changes. This is when behavioural change and communication has come to show its significant role for circular economy. This module presents a number of alternative actions that can be implemented by individuals, businesses and government. Examples of what have been done shows interrelated similarities occurred in each country in the region which could be adapted and localised to one another.

Conceptual framework

Globally, *A framework for shaping sustainable lifestyles* – determinants and strategies (UN Environment, 2016) and *Sustainable consumption guide for policy makers: Debunking myths and outlining solutions* (Asia Edition) (UN Environment, 2015) are key framework related to circular economy. For Asia-Pacific region, *Regional roadmap on SCP* (-numbers of policy actions for) on Sustainable Lifestyle and Education chapter is a regional guideline leading member countries. Numbers of policy actions for Sustainable Lifestyles were introduced namely:

- Product related policies i.e. banning of worst products, provision of product information at point of purchase, etc.
- Business related policies i.e. supporting businesses in shifting from selling physical products to selling services, etc.
- Policy approaches i.e. integrate sustainable consumption into high level policies, providing training for government officials and businesses related to the topic, etc.
- Using economic measures to shape consumption i.e. taxes on natural resources and pollution, full-cost pricing (including environmental cost) and use charges, etc.
- Distribution and Retail i.e. supporting businesses practicing 'choice editing', 'localising' and 'consumer co-ops', etc.

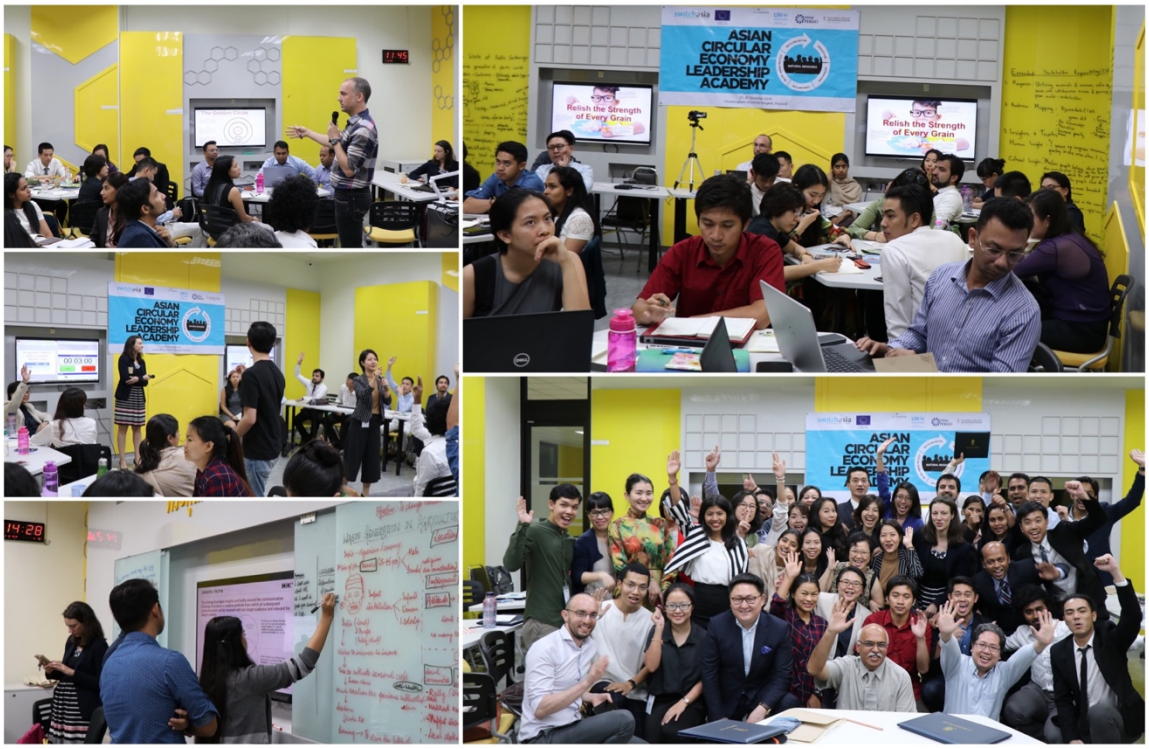
- Advertising i.e. restricting the amount and some types of advertising including using tax control on advertising
- Shifting the social context around consumer behaviour i.e. make more sustainable choice the default option, etc.

Consumption trends in Asia

Overall the urbanizing trend of 4.2 billion people during 2000-2015 and still expected to be increasing will lead to 50% of worldwide spending by 2030. The richer people, the more likely to be in debt from loans. Mostly expenses are spent on cars and consumption goods. This questions how sustainability can be integrated into the market, since 2015 data, Asia accounted for 46 and 81 billion tonnes of consumption and global material use respectively, or growing 7% per year. More livestock consumption, more household per person, more vehicles are expected to happen according to the database. Despite the trends, fundamental needs of human and myths about the misperception on sustainable consumption of people are what propelling market at the moment. However, there are many innovative ideas generated with intention on attempting to reverse the trends by initiating projects applicable to circular economy in different sectors expressly Household Energy, Mobility, Fashion, Repair Business, Waste Prevention and Recycling Support, Plastic bag bans and Finance.

Five steps of communication success

1. Purpose - A clear reason for Why
2. Audience Mapping - Who is the first person you want to reach with the message
3. Insights + Truths - What makes you unique and different
4. Creative Platform - A creative platform that can communicate to targeted audience
5. Execution & Content - How you would create products that can communicate efficiently



Platform of Knowledge Sharing

Throughout the academy, participants had gained the knowledge through a variety of methods from lectures, interactive workshops, individual and group presentations, activities and access to online learning platform (See more in **Activity 3: Online and offline course development**).

Participants Profile

About 200 applications submitted this year, only 34 representatives from Asia-Pacific region are selected to participate in this 'Asian Circular Economy Leadership Academy'. These people are working in the area where they can create high impact to their community on the topic of sustainable consumption and production, or circular economy.

Profile by Category

Academia
4 people

Government
14 people

NGO
7 people

Business

Country Representatives

The selected participants from 20 countries joined this programme are Afghanistan, Bangladesh, Bhutan, Cambodia, China, India, Indonesia, Japan, Lao PDR, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Thailand and Vietnam.

A Serie of Circular Economy Case Studies in Asia-Pacific Region

Prior to the workshop, participants were asked to come up with a project concept that can represent problems and solutions of a transition from linear economy to the circular economy. This activity aims to ignite their ideas on the topic of circular economy related to their working projects or areas they are interested in.

Throughout one week of the learning process, the knowledge they gained from each module had helped them to form the best solutions to fulfil their projects. The final output of the workshop is a serie of circular economy case studies in Asia-Pacific which can become a great sample for developing circular economy ideas/practices in Asia-Pacific region in the future.

The focus of project concepts produced by each participant are presented below:

Abdul Saboor Rahmany
Afghanistan
N/A

Mehedi Md Yusuf,
Bangladesh
An integration between the logic of nature and economic rationale for industrial symbiosis

Kezang Choden
Bhutan
Lack of knowledge, human capacities and financial support for CE

Pagna Chea
Cambodia
Awareness enhancement on sustainable green financing to all stakeholders

Huaxing fan
China
Circular fashion industry

LIU Ting
China
Enhancement of potential technologies for CE

Deepa Chaudhary
India
Communication of CE to relevant potential stakeholders

Muchtazar
Indonesia
Holistic waste collection in Indonesia

A K M Humayan Kabir Dewan
Bangladesh
Limitation in development of solar system

S M Faridul Haque
Bangladesh
Tackling single-use plastics at educational institutions, events, and offices

Tshering Yangzom
Bhutan
Reduction of waste from homes, offices, and commercial establishments

Chih Heng Lin
China
Unsustainable price of organic fresh produce in Thailand

Jiang Hong
China
N/A

Mengxue LU
China
Limitation of circular construction materials in Hong Kong

Himanshu Aggarwal
India
Integration of material and information flow chain

Rika Mitsuhashi
Japan
Resource efficient Agriculture and poverty reduction

Nakhalin Vorasarn
Lao PDR
How to create efficient public bus services

Ismail Ajmal
Maldives
Reduction of transportation at Male city, Maldives

Oyunchimeg Dondog
Mongolia
Implantation of sustainable lifestyle into people mindset both in urban and rural area

Min Mon Myat
Myanmar
Recycling Center in 6 townships of Yangon, Myanmar

Tooba Masood
Pakistan
Improvement of waste management in Pakistan

Juliet Ler
Singapore
Development of a productive digitalized waste collection system

Senarath Janani
Sri Lanka
Sustainable transportation in Sri Lanka

Sataphat Silsawang
Thailand
How CE can be applied in agriculture and poverty alleviation

Lay Mei Sim
Malaysia
Waste management for food business

Enkhbold Bukhchuluun
Mongolia
How to efficiently implement CE plans from the policy perspective

Tsedevsuren Bat-cohir
Mongolia
Promotion of Sustainable housing in Ger district, Mongolia

Devi Poudel
Nepal
Tackling Plastic water bottles issues

Alberto Jr. Leyes Longos
Philippines
Transformation of geo-polymers from industrial waste to water treatment materials

Nisansala Ranundeniya
Sri Lanka
How to stop using polythene for wrapping food in supermarket

Jitsai Santaputra
Thailand
Solar panels recycling

Thanapat Trakulpulchai
Thailand
Circular supply for zero waste concept

Bui Phuong Lan
Vietnam
Promotion of environmental protection through public and stakeholder's engagement

Le Thi Thu Van
Vietnam
Reduction of environmental impact from biomass fuel

Event Evaluation

Post event evaluation were also done by participants. The result is given in *Appendix.*

ACTIVITY 5: CALCULATE AND OFFSET CARBON FOOTPRINT OF EVENT

What is carbon footprint?

Carbon Footprint is a measure of the human activities impact on climate change and consequently to the environment. Carbon footprint is conveniently expressed in units of-grams, Kg. or Tons of Carbon Dioxide equivalent [CO_2e]. It relates to the sum of the greenhouse emissions which are directly or indirectly produced and emitted to the atmosphere due to

- the activities of a person, an organization or a company
- the production process of a product
- a service provision or an event

Carbon Neutral

Carbon Neutral is a term used to describe the state of an entity (such as a company, service, product or event), where the carbon emissions caused by them have been balanced out by funding an equivalent amount of carbon savings elsewhere in the world. An individual may become carbon neutral by carbon offsetting his carbon emissions. This can also be applied in the case of an organization, an event, the production of a product or the provision of a service.

Carbon Offsets (or carbon credits)

A “carbon offset” is an emission reduction credit from another organization’s project (usually in another location) that results in less carbon emissions in the atmosphere than would otherwise occur. These projects usually are renewable energy generation projects, energy efficiency ones or project type (solar, windfarm, hydro power, methane capture, waste diversion, energy efficiency or reforestation/forest protection) or country location.

Carbon Offsetting

Carbon offsetting is a way to compensate for the carbon emissions produced here by funding an equivalent carbon dioxide saving somewhere else. One can purchase carbon credits that are created through projects or events that mitigate climate change, or projects that preserve and protect the environment in some other part of the planet.

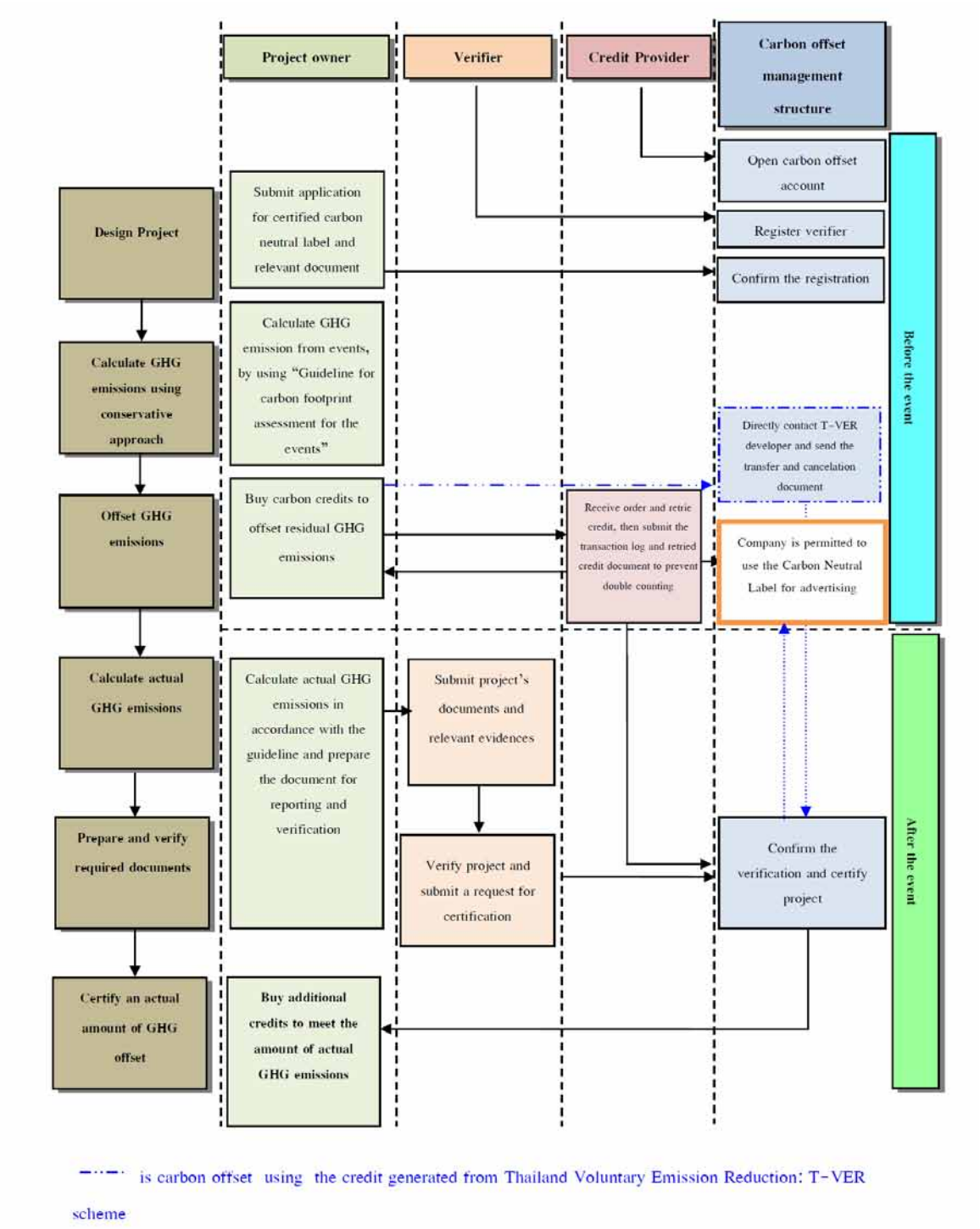


Figure 5.1 Procedure of carbon offset activity for events operation[1]

[1] Source: Thailand Greenhouse Gas Management Organization

Methodology for calculation carbon footprint of event

Emissions inventory scope

Scope 1: Direct Greenhouse Gas Emission

Direct GHG Emissions from services, tools or equipment owned by a conference organizer who is responsible for the operation costs.

1.1 Energy Consumption: GHG Emission from energy consumption (with proper combustion) that is a responsibility of an organizer such as in LPG consumption when cooking.

1.2 Food and Beverage: Preparation of food and beverage for a conference or an event.

Scope 2: Indirect Greenhouse Gas Emission

Indirect GHG emissions form consuming purchased electricity, steam, heating and cooling during an event and venue preparation throughout the conference period.

Scope 3: Other Indirect Greenhouse Gas Emission

Other indirect GHG emissions beyond the scope of the 2nd category

Transportation

CO_2 emission from domestic and international transportation of participants, which includes travelling by car, by bus, by train, by plane, etc.

Accommodation

CO_2 emission from staying in the city where the conference takes place.

Conference Materials

Conference materials: CO_2 emission in acquiring raw material, producing and shipping of any conference materials should all be taken into account when calculating the emission.

Waste

CO_2 emission from waste, generated by conference, management: storage, shipping and waste disposal system should be accounted for too.

Data Collection

Data collection sheets will be provided to all venue operators and participants to collect data relevant to the events operations. These will include energy use, transportations, fuel consumption, food and beverage, waste disposal and materials utilized. For the transport data, surveys will be taken with a suitable sample of attendees to determine the use of transport methods to and from the event. To ensure compliance, data collection will be embedded with training of venue staff to ensure accuracy of data collection.

Asian Circular Economy Leadership 2018 emissions inventory

Carbon emissions profile

Asian Circular Economy Leadership 2018 is predicted to have a total emission of 26.25 tonnes CO_2-e inclusive of out of scope events. The breakdown of emissions outlined in the rest of the report is based on only in-scope events. These emissions were calculated from activities of event on 25-26 September and 3-9 December 2018. The breakdown of emissions from sources are shown in Table 1 and Figure 1 below. Most of the emissions for the event are from transport (86%) and accommodation (6%).

Verification statement for carbon footprint of the event is provided in *Appendix*.

Total Carbon footprint calculator for event

Table 5.1 Carbon footprint calculator for each day of event and activities

Scope	September			December							Total Carbon Emission (tCO_2e)
	Before 25th	25th	26th	3rd	4th	5th	6th	7th	8th	9th	
Scope 1	0.00	0.07	0.04	0.09	0.08	0.09	0.10	0.08	0.08	0.00	0.63
Scope 2	0.00	0.16	0.05	0.01	0.23	0.12	0.23	0.23	0.23	0.00	1.26
Scope 3	2.24	0.59	1.43	8.49	0.32	0.62	1.17	0.94	0.59	7.97	24.36
Total	2.24	0.82	1.53	8.59	0.62	0.84	1.49	1.25	0.90	7.97	26.25

Table 5.2 The amount of carbon emission for each activity

Carbon footprint from activities	*Total Carbon Emission (tCO_2e)*
From food and beverage	0.63
From transportation	22.62
From shuttle bus in event	0.00
From Accommodations	1.53
From Electricity	1.26
From Printings	0.09
From Waste	0.13
Total Carbon Emission (tCO_2e)	26.25

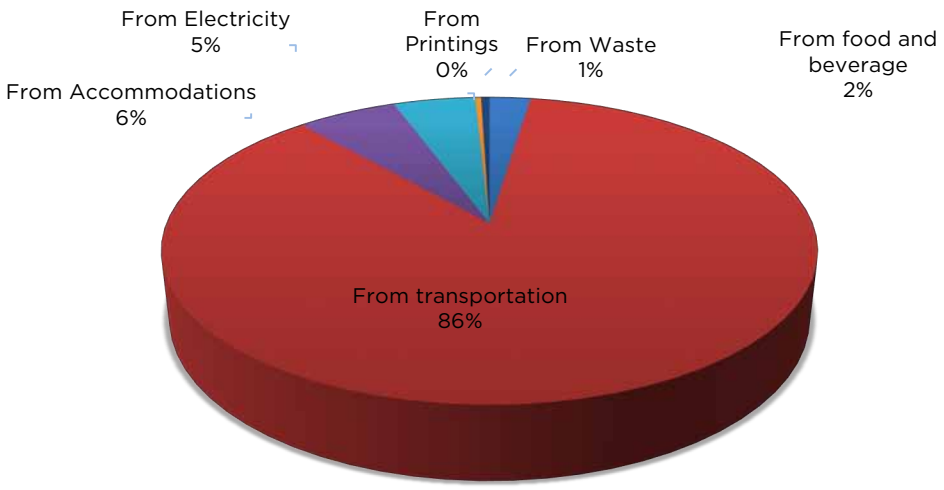


Figure 5.2 Percentage of carbon emission of the event

Appendix

MEETING MINUTES

Meeting/Project Name:	Timeline and Procedure for the SCP Academy		
Date of Meeting:	Wednesday, August 15th 2018	**Time:**	3.30 p.m. – 5.30 p.m.
Minutes Prepared By:	Mr.Weerapong Unawong Ms.Bunsita Kaewsing	**Location:**	Meeting room at HSM, 8th floor - Chulalongkorn University Research Building, Bangkok.

1. Meeting Agenda

1.1 Advisory meeting date and invitations and agenda

1.2 Operational considerations for SCP Academy

1.3 Call for applications timeline

1.4 Online platform alternatives

2. Attendance at Meeting

Name	Affiliation	E-mail
1. Ms. Janet Salem	UNEP	janet.salem@un.org
2. Mr. Peerayot Sidonrusmee	UNEP	sidonrusmee@un.org
3. Mr. Mushtaq Memon	UNEP	memon@un.org
4. Ms. Pasicha Chaikaew	Chulalongkorn University	pasicha.c@chula.ac.th
5. Ms. Wilailuk Niyommaneerat	Chulalongkorn University	kae.wilailuk@gmail.com
6. Ms. Bunsita Kaewsing	Chulalongkorn University	aom_bunsita@hotmail.com
7. Mr. Weerapong Unawong	Chulalongkorn University	weerapong.uw@gmail.com

3. Notes, Decisions and Issues

Topic

Advisory committees meeting

- Meeting date has been postponed from 24 September to 25-26 September 2018
- It will be much easier to extend the meeting period to be at least a day and a half in order to have more time to discuss the outline and select responsible persons to develop content.
- This first meeting we will design the scope of what will the modules look like.

SCP materials and content

- 3 years academy accumulates tertiary curricular and after 4 years we will have full Master program of SCP available
- Possible 32 credits for a full tertiary curriculum
- Regarding tertiary program, it can probably be 4 modules with 8 credits each (32 in total), then we take 1 module for each year for SCP academy and take this opportunity to mature it to be a full textbook/materials with 4 chapters (for instance).
- At least one month to finish the content material including comment and revising
- SCP academy actually is a problem-based learning, not a lecture. It should contain activities like quiz, assignment, exam and debate series. The target of that is to draw interesting people around the region that we think they could have impact for SCP role.

Online platform

- Online platform can be only just one or selected modules NOT all the courses.
- The online module is for specific focus, for example, sustainable life-style and procurement.
- We can do either full massive online course with limited time or on self-paced learning to provide basic understanding of the topic with some comprehensive test or quiz. We should also have some intensive content with case studies rather than only introductory substances.
- Online courses are for the students with some SCP background.
- Online platform can be places in any website, however, we have to head university and UNEP logos. We can put online course into self-paced platform first then our website (or whatever). 5000 is the expected number of people that we want them to reach our course, not everyone has to finish the course but at least he/she can learn something important with respect to SCP.

Implementation for SCP academy

- Ideally, material for SCP academy should be finished 2 weeks before the implementation of SCP academy to let the participants learn about the content before participating.
- With regards to call for application timeline and selection criteria, UNEP team has to discuss this with his boss first because they want to reduce our work in term of checking, collecting, reviewing and everything to make this process easier. (Maybe use Google form)
- Janet suggests to put carbon food-footprint to be one of the training exercise to give awareness on what the participants eat in a day and consequences after that.

Other

- Monthly advisory committee meeting can be only a key person, not everyone has to join this remote conference.
- Carbon footprint framework - need more emission factor column to comprehend the framework.

Meeting Minutes

Meeting/Project Name:	The first Advisory Committee Meeting on Strengthening online and offline SCP training capacity in tertiary institutions in Asia and the Pacific		
Date of Meeting:	September, 25th, 2018 September, 26th, 2018	**Time:**	9.00 a.m. – 4.00 p.m. 9.00 a.m. – 12.00 p.m.
Minutes Prepared By:	Mr. Weerapong Unawong Ms. Bunsita Kaewsing	**Location:**	Chamchuri 10th Building, Room 702 /Sasa International House, Dipak C. Jain Hall, Chulalongkorn University, Bangkok, Thailand

1. Meeting Agenda

1.1 Discuss key components on SCP that should be included in the tertiary curriculum and online couse

1.2 Develop procedural workplan to coordinate tertiary curricular package and training outline

1.3 Develop technical content of curriculum outlines

2. Attendees

Name	Affiliation	E-mail
1. Professor Wanida Jinsart, Ph.D.	Faculty of Science, Chulalongkorn University, Bangkok, Thailand	wanida.j@chula.ac.th
2. Professor Chettiyappan Visvanathan, Ph.D.	SERD, Asian Institute of Technology, Bangkok, Thailand	visuvaru@gmail.com
3. Ms. Wisuttinee Sangpradab	Knowledge Network Institute of Thailand, Bangkok, Thailand	wisuttinee@knit.or.th
4. Ms. Archana Datta	Federation of Indian Chambers of Commerce and Industry (FICCI), India	archana.datta@ficci.com
5. Mr. Maik Fuellmann	TRIS Corporation Limited, Bangkok, Thailand	maik.fuellmann@hotmail.com
6. Professor (Anthony) Shun Fung Chiu, Ph.D.	University Fellow and Professor, De La Salle University, Philippines	anthony.chiu@dlsu.edu.ph
7. Professor Muhammad Irfan Khan, Ph.D.	Environmental Science/International Islamic University, Islamabad-Pakistan	drirfan@iiu.edu.pk
8. Associate Professor Orathai Chavalparit, Ph.D.	Faculty of Engineering, Chulalongkorn University, Bangkok, Thailand	orathai.c@chula.ac.th

9. Ms. Ha Nguyen	Environment and Development Research Cluster, Stockholm Environment Institute-Asia Centre, Bangkok, Thailand	ha.nguyen@sei.org
10. Pongsun Bunditsakulchai, Ph.D.	Transportation Institute, Chulalongkorn University, Bangkok, Thailand	b.pongsun@gmail.com
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12. Assistant Professor Niyada Kiatying-Angsulee, Ph.D.	Faculty of Pharmaceutical Sciences, Chulalongkorn University, Bangkok, Thailand	niyada.k.ang@gmail.com
13. Asst. Prof. Dr. Somporn Kamolsiripichaiporn	Office of Research Affairs, Chulalongkorn University, Thailand	kamolsomporn@gmail.com
14. Asst. Prof. Dr. Pasicha Chaikaew	Department of Environmental Science, Faculty of Science, Chulalongkorn University, Bangkok, Thailand	pasicha.c@chula.ac.th
15. Dr. Wilailuk Niyommaneerat	Research Unit of Environmental Management and Sustainable Industry, Faculty of Engineering, Chulalongkorn University, Bangkok, Thailand	kae.wilailuk@gmail.com
16. Asst. Prof. Dr. Carl Middleton	International Development Studies (MAIDS) Program and the Center for Social Development Studies (CSDS), the Faculty of Political Science, Chulalongkorn University, Bangkok, Thailand.	carl.chulalongkorn@gmail.com
17. Prof. Dr. Mushtaq Memon	United Nations Environment Programme, Regional Office for Asia Pacific, Bangkok, Thailand.	memon@un.org
18. Ms. Janet Salem	United Nations Environment Programme, Regional Office for Asia Pacific, Bangkok,Thailand.	janet.salem@un.org

19. Mr. Peerayot Sidonrusmee	United Nations Environment Programme, Regional Office for Asia Pacific Bangkok, Thailand.	sidonrusmee@un.org
20. Mr. Weerapong Unawong	-	weerapong.uw@gmail.com
21. Ms. Bunsita Kaewsing	-	aom_bunsita@hotmail.com
22. Ms. Vijittar Jan-Uthai	-	-
23. Ms. Natcha Rugkarn	-	-
Observers		
24. Ms. Grissanee Suwanpahu	Center of Excellence on Hazardous Substance Management (HSM) Chulalongkorn University, Bangkok, Thailand	-
25. Mr. Titiwut Pongpanich	Center of Excellence on Hazardous Substance Management (HSM) Chulalongkorn University, Bangkok, Thailand	-
26. Ms. Nuayoi ThangChotika	Center of Excellence on Hazardous Substance Management (HSM) Chulalongkorn University, Bangkok, Thailand	-
27. Mrs. Siriluk Phokate	Center of Excellence on Hazardous Substance Management (HSM) Chulalongkorn University, Bangkok, Thailand	-
28. Mr. Phonpavit Thongphaijit	Center of Excellence on Hazardous Substance Management (HSM) Chulalongkorn University, Bangkok, Thailand	-
29. Mr. Suparuk Chaipurimas	Center of Excellence on Hazardous Substance Management (HSM) Chulalongkorn University, Bangkok, Thailand	-
30. Mr. Kittichok Sriprarote	Center of Excellence on Hazardous Substance Management (HSM) Chulalongkorn University, Bangkok, Thailand	-

31. Ms. Kannika Kwansawas	Center of Excellence on Hazardous Substance Management (HSM) Chulalongkorn University, Bangkok, Thailand	-
32. Mr. Dirk Wangkem	United Nations Environment Programme, Regional Office for Asia Pacific, Bangkok, Thailand.	-
33. Ms. Lixia Zhang	United Nations Environment Programme, Regional Office for Asia Pacific, Bangkok, Thailand.	-

3. Notes from discussion

Tuesday, September 25th, 2018

Meeting summary

This project is a part of long-term programme that aims towards 4-year time developing materials for full Master's Degree on SCP. However, for these two days meeting, it is more focusing on online course and implementation (SCP Academy training in person) in the first year. Once the structure, content and feedback from those activities are completed, next step is to enhance those materials to be more academic, specific and suitable for Master's Degree level in the year afterwards. After the first day of the meeting, the committees agrees to start off with the Circular Economy (CE) course in the first year. The key components related to CE were discussed and led to distinct modules and draft online of content.

Working group discussion on curricular development

Group 1: Indicators, Behaviour change, Communication

Participants: Prof. Dr. Muhammad Irfan Khan, Prof. Dr. Chettiyappan Visvanathan, Asst. Prof. Dr. Carl Middleton

Discussion Modules

Indicators for Circular Economy

Contents

- Resource use patterns
- Indicators for the various CE business models (eg. EoL Recycling rate, usage rate of assets – passenger km/car/day?)

Objectives

- Imparting skills, qualitative & quantitative link to indicators
- Provide knowledge to students to identify indicators & measures to CE

Parameters

- Different types of indicators ← measurement
- Social & behaviour ← measurement
- Policy analysis interrelationship with CE
- Able to measure the select the right measurement

Behaviour change

Contents • Engagement of faith based organizations • Meditation, mindset, value change • Behavioral insights (nudging, societal norms) • Innovation for inclusive development – Behaviour change of consumers, policy makers, business decision makers. How does it occur? • IGES KAN reference on sustainable consumption Objectives • Learn how it means about behavior changes? • How much can you do to change behavior • Behavior change vs value change case studies • Cultural context relating to behavior change • Different types of behavior changes i.e. industry change, organization change, public policy change, give examples for each category, how these changes can affect the CE Outcomes • Able to articulate strategies that could catalyze individual, organization and public policy change for transition to a circular economy.
Communication
Contents • Stakeholder engagement, understanding your market • Sustainability reporting, public disclosure Objectives • Provide the diff forms of communication among stakeholders, use as a tool for CE (forms & branches) • Link communication to change the mindset, engage stakeholder to deliver transparent message about CE

Comment:

1. Connect outputs to link with the SDGs targets
2. What can participants achieve after the course?

Group 2: Innovation, Business, Technologies

Participants: Ms. Archana Datta, Prof. Dr. Shun Fung Chiu (Anthony), Asst. Prof. Dr. Ritika Mahajan

Discussion Modules

Innovation
Contents • Innovation management, what is conventional vs innovation? • Sustainability mindset in innovation (desired future vs conventional) • Technology – how to leverage innovative tech for CE • Design
Business
Contents • 3R – Reduce, Reuse, Recycle (Redesign, Rethink…) • FICCI – CE business models – Challenges and opportunities of: - Resource Recovery - Sharing Platform

- Product Life extension - Product as service (PSS) – use based pricing (Zoom car) - Circular supplies • Business case for CE? Jobs? Profitability? Cost-Benefit Analysis – at what time horizons to target investment? Branding/Marketing • Strategic CSR and Creating Shared Value
Technologies
Contents • Case studies in Sectors: **energy, lighting** (International Resource Panel report, ASEAN SHINE project); **plastics** as a case study, **urban**, **food and ag supply chain**, **tourism**.

Notes:

- How to make it more clear & precise

"innovative business for CE" new & unique, significance of big data, sustainability mindset, design thinking ← innovative business model

- Learning topics
  - Background of business model, financing
  - Roadmap for CE, subtopics ? RE, sharing platform, circular supply, +2 more?
- Objective
  - Understand & assess about innovative business of CE
  - Learn about case studies..innovative business model e.g food, energy etc.
- How can we customize online/offline course?
  - Need repository, accessible for all members (students, instructors, and admins)
  - Share learning source i.e. E-learning, (might be reluctance), perhaps combine e-learning + m-learning, Include AI, contains knowledge test, evaluate efficiency of training
  - Most challenging part ← make sustainability SEXY..find the way to use social media as learning source
  - The exciting learning approach

Comments:

1. Thinking about generation ← focus on young gen
2. Create incentive to learn online
3. Collaborate with local authority/company
4. Matching people on the particular knowledge
5. Competition for sustainable achievement
6. Use social media ← FB as a platform

Group 3: Introduction, Finance, Policies

Participants: Ms. Janet Salem, Ms. Ha Nguyen, Asst. Prof. Dr. Pasicha Chaikaew, Ms. Lixia Zhang

Discussion Modules

Introduction
Contents • Status of consumption and production in Asia and the Pacific • Basic concepts of CE and SCP • Evolution of CP, CDM, EE, SMM, EID, RESP • Add other issues such as gender, ethics, moral etc. • Policy approach in response to SDGs

• Challenges and opportunities in Asia and the Pacific (Inequality, awareness, Stakeholder engagement, economics cost and jobs) • Possible solution for unsustainable consumption and production (learner's choice)
Finance
Contents • Traditional (shifting from P&C to SCP) - Private (Banks) - Public - Multilateral (IFC) • Emerging - Crowdsource - Venture capital - Peer to peer - Initial coin offering (ICO) - Approaches • Approaches - Green finance - Green bonds - Microfinance - Partnership with private sectors - Divest - Environment and sustainability assessment - Equator principle (Banks) - Sustainable investment - Sustainable stock exchange
Policies
Contents • Example of Policies in CE SCP - International - Regional - National - Local (Sub national) • Type - Mainstream in 5YP - Implementation • Enforcement - Inter-ministerial cooperation - Policy cycle - problem definition, policy goal, implementation, N&C - Consequences of inaction - Stakeholder engagement

Wednesday, September 26th, 2018
Meeting summary

The results from group discussion are summarized and structured following a typical course outline. The committees agrees on this draft outline. A total of seven modules contains learning objective and topics. Details of each module will be developed by responsible groups of committee. A summary of the meeting is as follows:

Circular Economy (CE)

1. Course description

- Link CE with SDG targets
- This course covers....

2. Module 1: Introduction

Content contributors: Everyone

2.1 Learning objective

Obtain the current situation of CE that can be practical for self-learning

2.2 Topics

2.2.1 The importance of CE for individual level

Linkage of problem based-survey and CE

2.2.2 How CE plays role on different occupation sectors

2.2.3 Status of consumption and production in Asia and the Pacific

2.2.4 Basic concepts of CE and SCP

2.2.4.1 Evolution of CP, CDM, EE, SMM, EID, RESP

2.2.4.2 Add other issues such as gender, ethics, moral etc.

2.2.5 Policy approach in response to SDGs

2.2.6 Challenges and opportunities in Asia and the Pacific (Inequality, awareness, stakeholder engagement, economics cost and jobs)

2.2.7 Possible solution for unsustainable consumption and production (learner's choice)

*Note: the topics should be connected with learner's basic information

3. Module 2: Innovation and technology

Content contributors: Prof. Dr. Shun Fung Chiu (Anthony)
Prof. Dr. Orathai Chavalparit

3.1 Learning objective

Understand and assess about innovative business for CE

3.2 Topics

3.2.1 Conventional vs innovation (Significance of innovation)

3.2.2 Data utilization

3.2.3 Design thinking

3.2.4 Sustainability mindset

3.2.5 Case studies in sectors: energy, lighting, plastics, urban, food and ag supply chain, tourism, industry

3.3 Cross-cutting implementation

3.3.1 Sharing repository that can be accessible for all members

3.3.2 Combining E-learning with M-learning

3.3.3 Attractive learning source on application or social media

4. Module 3: Policies

Content contributors: **Prof. Dr. Shun Fung Chiu (Anthony)**
Asst. Prof. Niyada Kiatying-Angsulee

4.1 Learning objective

Understand and assess a wide range of CE policies from different scales

4.2 Topics

4.2.1 Different scales of policy on CE and SCP (case studies in Asia and the Pacific)
- 4.2.1.1 International
- 4.2.1.2 Regional
- 4.2.1.3 National
- 4.2.1.4 Local (Sub national)

4.2.2 Types
- 4.2.2.1 Mainstreaming in 5 YP
- 4.2.2.2 Implementation

4.2.3 Policy implementation measures
- 4.2.3.1 Enforcement
- 4.2.3.2 Inter-ministerial cooperation
- 4.2.3.3 Policy cycle - problem definition, policy goal, implementation, N&C
- 4.2.3.4 Consequences of inaction

5. Module 4: Business models

Content contributors: **Prof. Dr. Shun Fung Chiu (Anthony)**
Ms. Archana Datta
Asst. Prof. Dr. Ritika Mahajan
Ms. Wisuttinee Sangpradab

5.1 Learning objectives

5.1.1 Enable students to understand innovative business models for CE
5.1.2 Demonstrate innovative business models for CE to students

5.2 Topics

5.2.1 5R-Reduce, Reuse, Recycle, Redesign, Rethink
5.2.2 Challenges and opportunities of:
- 5.2.2.1 Resource Recovery
- 5.2.2.2 Sharing Platform
- 5.2.2.3 Product Life extension
- 5.2.2.4 Product as service (PSS)
- 5.2.2.5 Circular supplies

5.2.3 Business case studies for CE i.e. job, profitability, cost-benefit analysis, eco-branding/marketing
5.2.4 Strategic CSR and creating shared value

6. Module 5: Finance for CE

Content contributors: **Prof. Dr. Shun Fung Chiu (Anthony)**
Asst. Prof. Dr. Ritika Mahajan
Ms. Wisuttinee Sangpradab

6.1 Learning objective

- ?

6.2 Topics

6.2.1 Traditional (shifting from P&C to SCP)

6.2.2.1 Private (Banks)

6.2.2.2 Public

6.2.2.3 Multilateral (IFC)

6.2.2 Emerging

6.2.2.1 Crowdsource

6.2.2.2 Venture capital

6.2.2.3 Peer to peer

6.2.2.4 Initial coin offering (ICO)

6.2.3 Approaches

6.2.3.1 Green finance

6.2.3.2 Green bonds

6.2.3.3 Microfinance

6.2.3.4 Partnership with private sectors

6.2.3.5 Divest

6.2.3.6 Environment and sustainability assessment

6.2.3.7 Equator principle (Banks)

6.2.3.8 Sustainable investment

6.2.3.9 Sustainable stock exchange

7. Module 6: Indicators

Content contributors: Prof. Dr. Shun Fung Chiu (Anthony)
Ms. Archana Datta
Prof. Dr. Muhammad Irfan Khan
Mr. Maik Fuellmann
Dr. Pongsun Bunditsakulchai

7.1 Learning objectives

7.1.1 Develop/impart skills to develop CE indicators with qualitative and quantitative parameters and link to SDG indicators

7.1.2 Provide the knowledge to the students to identify indicators and measure their progress of CE

7.2 Topics

7.2.1 Definition

7.2.1.1 Type of indicator

- Measurable: quantitative indicators i.e. technical and environmental indicators
- Unmeasurable: qualitative indicators i.e. social and behavioral

7.2.2 Typical sustainable development indicators i.e. SDI

7.2.3 Indicators of CE: How to develop these indicators, how to collect data and interpret them. Presentation of info-graphics to understand and monitor these indicators

7.2.4 Indicators and CE policy initiatives with case studies

8. Module 7: Behavioural Change and Communication

Content contributors: Ms. Janet Salem

8.1 Learning objectives

Provide multi-dimensional knowledge on theories of behavioural change and how it relates to achieving a CE

8.2 Topics

8.2.1 Value change VS behavioural change
8.2.2 Individual change
8.2.3 Organizational change
8.2.4 Public policy change
8.2.5 Cultural context
8.2.6 Communication
8.2.6.1 Stakeholder engagement
8.2.6.2 Sustainability reporting
8.2.6.3 Advertising/Marketing

9. CE course evaluation criteria

9.1 Pass 70% of each module
9.2 Accomplish at least 80% of self-paced learning track
9.3 Provide extra-case study on selected module

Clarification issues

1. How deep is the Course?

- The course should not be too difficult, it should be for beginner or intermediate level.
- For the online course (the first phase), the whole theme content should be for everyone and take only a short amount of time with different levels of content.
- For the implementation, Maik's team can provide a short demo on how it should look like for a week of SCP academy and short preparation for participants after receiving corrected content from decision maker.
- Regarding the content, we should basically create options for learners so that they can choose what they want to learn in order to fit their profits.

2. How many hours for each module?

- The period of time for teaching each module should be equivalent, probably 3-6 hours or less.
- For mobile learning or e-learning, it should not be longer than 45 minutes. Besides, learning materials that we provide should not be the same uniform structure, it should be variety to make it more fun and interesting to obtain the knowledge.

3. Who are responsible to Develop the contents? (consultant fee included)

- A group of content team will revise those content from developers (committees) and allocate them into different level of difficulty to make it more suitable for learners' choice and interest.
- **TRELLO** will be used for contributing all the materials and tracking the progress on module development.

4. Timeline

- Contribution due to the end of October, 2018

5. Any incentives for accessing the CE course?

- To be discussed in the future

Content Contributors

Module	Content Contributor
Course description	Everyone
Module 1: Introduction	Everyone
Module 2: Innovation and technology	Prof. Dr. Shun Fung Chiu (Anthony) Prof. Dr. Orathai Chavalparit
Module 3: Policies	Prof. Dr. Shun Fung Chiu (Anthony) Asst. Prof. Niyada Kiatying-Angsulee
Module 4: Business models	Prof. Dr. Shun Fung Chiu (Anthony) Ms. Archana Datta Asst. Prof. Dr. Ritika Mahajan Ms. Wisuttinee Sangpradab
Module 5: Finance for CE	Prof. Dr. Shun Fung Chiu (Anthony) Asst. Prof. Dr. Ritika Mahajan Ms. Wisuttinee Sangpradab
Module 6: Indicators	Prof. Dr. Shun Fung Chiu (Anthony) Ms. Archana Datta Prof. Dr. Muhammad Irfan Khan Mr. Maik Fuellmann Dr. Pongsun Bunditsakulchai
Module 7: Behavioural Change and Communication	Suggested by Ms. Janet Salem

4. Next meeting

Next meeting be conducted though Skype on October, 16th, 2018 at 4.00 pm. (+GMT7)

Meeting Minutes

Meeting/Project Name:	Monthly Advisory Committee Meeting on Strengthening online and offline SCP training capacity in tertiary institutions in Asia and the Pacific		
Date of Meeting:	16th October 2018	**Time:**	4.00 pm – 5.00 pm (GMT+7)
Minutes Prepared By:	Mr. Kittikun Saksung Mr. Weerapong Unawong	**Location:**	Online meeting through Skype

1. Meeting Agenda

1.1 Work procedure clarification

1.2 Invitation to serve as a key person for each module

1.3 Discussion on improving the effectiveness of content production

2. Attendees

Name	Affiliation	E-mail
1. Ms. Archana Datta	Federation of Indian Chambers of Commerce and Industry (FICCI), India	archana.datta@ficci.com
2. Mr. Maik Fuellmann	TRIS Corporation Limited, Bangkok, Thailand	maik.fuellmann@hotmail.com
3. Prof. Dr. (Anthony) Shun Fung Chiu	University Fellow and Professor, De La Salle University, Philippines	anthony.chiu@dlsu.edu.ph
4. Prof. Dr. Muhammad Irfan Khan	Environmental Science/International Islamic University, Islamabad-Pakistan	drirfan@iiu.edu.pk
5. Dr. Pongsun Bunditsakulchai	Transportation Institute, Chulalongkorn University, Bangkok, Thailand	b.pongsun@gmail.com
6. Asst. Prof. Dr. Ritika Mahajan	TERI School of Advanced Studies, New Delhi, Delhi, India	ritika.mahajan@terisas.ac.in
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9. Ms. Madeleine Recknagel	Senior Lecturer, Bangkok University, Thailand	madeleine.r@bu.ac.th
7. Asst. Prof. Dr. Pasicha Chaikaew	Department of Environmental Science, Faculty of Science, Chulalongkorn University, Bangkok, Thailand	pasicha.c@chula.ac.th

8. Ms. Janet Salem	United Nations Environment Programme, Regional Office for Asia Pacific, Bangkok,Thailand.	janet.salem@un.org
10. Mr. Weerapong Unawong	-	weerapong.uw@gmail.com
11. Mr. Kittikun Saksung	-	kittikun.saksung@gmail.com
12. Ms. Natwadee Pluemchingchai	Environmental Engineering, Chulalongkorn University, Thailand	natwadee_plu@hotmail.com
13. Ms. Nantamol Limphitakphong	Research unit of environmental management and sustainable industry, Chulalongkorn University, Thailand	nantamoll@gmail.com
14. Ms. Grissanee Suwanpahu	Research unit of environmental management and sustainable industry, Chulalongkorn University, Thailand	grissanee.s@gmail.com

3. Meeting summary

3.1 Brief introduction to the project

This project aims to:

- **Develop the SCP tertiary curriculum** — this project is a part of long-term programme that aims towards 4-year time developing materials for full Master's Degree on SCP. In the first year we will focus on the topic of Circular Economy. The final output of this part will benefit as a main source of material used for training in leadership academy and online platform which will be explained in the following sections.
- **Conduct the leadership program for young professionals around the Asia-Pacific region** — this implementation aims to improve the knowledge of young professionals from public sector, private sector and civil society organizations who can contribute to the design and implementation of innovative solutions for policies, business models, technologies, financing mechanisms and practices that promote Circular Economy in the Asia-Pacific region. This programme will be designed as an interactive environment where around 35 participants from Asia-Pacific region can learn through creative design thinking methods in the first week of December 2018.
- **Establish the online course** — the online course is developed with the aim of being a prototype for a centralized repository online material about SCP that is accessible for newcomers to this topic or as a refresher for involved stakeholders in any sectors as well as professionals working on SCP on their own.

3.2 Key person and contributors for each module

Key person (taking the lead) and contributors agreed on preparing all the materials and contents in any kind of media (text/video/infographic/website) and attaching those in the responsible topic in Trello platform.

Key person and Content Contributors

Module	Key person	Content Contributor
Course description	Chula team	Everyone
Module 1: Introduction	Chula team	Everyone
Module 2: Innovation and technology	Prof. Dr. Shun Fung Chiu (Anthony)	Prof. Dr. Orathai Chavalparit
Module 3: Policies	Assoc. Prof. Dr. Wang Tao	Prof. Dr. Shun Fung Chiu (Anthony) Asst. Prof. Niyada Kiatying-Angsulee
Module 4: Business models	Asst. Prof. Dr. Ritika Mahajan	Prof. Dr. Shun Fung Chiu (Anthony) Ms. Archana Datta Ms. Wisuttinee Sangpradab
Module 5: Finance for CE	Suggested by Ms. Janet Salem	Prof. Dr. Shun Fung Chiu (Anthony) Asst. Prof. Dr. Ritika Mahajan Ms. Wisuttinee Sangpradab
Module 6: Indicators	Prof. Dr. Muhammad Irfan Khan	Prof. Dr. Shun Fung Chiu (Anthony) Ms. Archana Datta Dr. Pongsun Bunditsakulchai
Module 7: Behavioural Change and Communication	Suggested by Ms. Janet Salem	

3.3 Suggestions for the effectiveness of content production

- Prof. Irfan's suggestion: having the common structure for every module such as begin with introduction mentioned all aspects involving in the module, begin with questions to ignite learners' curiosity or trigger learners' motivation on pursuing further into details of the content. Samples questions are:

- What can you do if (may be with case studies)?
- What is your impact to the society on particular issues?
- What will you do when you go back?/How would you apply this to your case?

These kinds of questions could form them a good mindset and go back to do something successful with their own communities/organisations.

- Ms. Archana's suggestion: we need some additional information on the structure as well as guidelines to develop these modules i.e. in terms of how many case studies, examples, best practices etc. should go in a module.

- Mr. Maik's suggestion:

- We need materials that can be directly applied to the online platform i.e. PowerPoints, case studies, written materials that are very concise and very precise. Possibly, also some short MOOCs and videos that utilized before, illustrations for the content of the course that are as appealing as possible. Any kind of materials: papers, media you would like to share, his team can deal with them.
- For concerns about the copyrights, his team have experience on working with sustainability content involving copyrights. So, any contents provided will also be screened by the team before putting up on the platform.
- It is also possible to send your materials to the group asking for opinion from people who have experience in producing SCP curriculum within advisory committee team.

3.4 Content contribution due date

Content contribution is due on the 15th November 2018.

4. Next meeting

Next meeting be conducted through Skype on 13th November 2018 at 4.00 pm. (GMT+7)

Meeting Minutes

Meeting/Project Name:	Monthly Advisory Committee Meeting on Strengthening online and offline SCP training capacity in tertiary institutions in Asia and the Pacific		
Date of Meeting:	14th November 2018	**Time:**	4.00 pm – 5.00 pm (GMT+7)
Minutes Prepared By:	Mr. Kittikun Saksung Mr. Weerapong Unawong	**Location:**	Online meeting through Skype

1. Meeting Agenda

1.1 Progress updating

1.2 Asian circular economy leadership academy and Online application showing case

2. Attendees

Name	Affiliation	E-mail
1. Ms. Archana Datta	Federation of Indian Chambers of Commerce and Industry (FICCI), India	archana.datta@ficci.com
2. Mr. Maik Fuellmann	TRIS Corporation Limited, Bangkok, Thailand	maik.fuellmann@hotmail.com
3. Prof. Dr. (Anthony) Shun Fung Chiu	University Fellow and Professor, De La Salle University, Philippines	anthony.chiu@dlsu.edu.ph
4. Prof. Dr. Muhammad Irfan Khan	Environmental Science/International Islamic University, Islamabad-Pakistan	drirfan@iiu.edu.pk
5. Asst. Prof. Dr. Ritika Mahajan	TERI School of Advanced Studies, New Delhi, Delhi, India	ritika.mahajan@terisas.ac.in
6. Assoc. Prof. Dr. Wang Tao	Circular Economy Research Institute, Tongji University, China	a.t.wang@foxmail.com
7. Asst. Prof. Dr. Pasicha Chaikaew	Department of Environmental Science, Faculty of Science, Chulalongkorn University, Bangkok, Thailand	pasicha.c@chula.ac.th
8. Ms. Janet Salem	United Nations Environment Programme, Regional Office for Asia Pacific, Bangkok,Thailand.	janet.salem@un.org
9. Mr. Edouard Legeay	TRIS Corporation Limited, Bangkok, Thailand	edouard@uniquizz.com
10. Ms. Lixia Zheng	SWITCH-Asia – the European Union funded programme UN Environment China Office	lixia.zheng@un.org
11. Mr. Kittikun Saksung	-	kittikun.saksung@gmail.com
12. Mr. Weerapong Unawong	-	weerapong.uw@gmail.com

3. Meeting summary

3.1 Progress updating

This section in the meeting is about letting each key person and module contributors update their progress to the others and discussing if there are any points we should develop together for the effectiveness of content production.

- *Prof. Dr. (Anthony) Shun Fung Chiu*: He and his team have uploaded almost everything on Trello, considered more than 90% of his side is finished. He has also accepted to be a facilitator on Module B: Innovation and technology and also volunteered to contribute Module A: introduction to Circular Economy, however, he will be available only in the morning on 5th December 2018 regarding to his schedule.
- *Prof. Dr. Muhammad Irfan Khan*: He has confirmed that 80% from his side is completed but have not uploaded anything on Trello yet, probably on this Friday (16th November 2018).
- *Assoc. Prof. Dr. Wang Tao*: Regarding module of policies for Circular Economy, more than 80% is completed. He needs few more days to finish the sections of reading materials and reviews questions.
- *Module 1: Introduction to Circular Economy*: Chula team will be responsible on this module and more than 50% of work is completed.
- *Module 4: Business models*: Asst. Prof. Dr. Ritika Mahajan and her team still working this module and it will be finished no longer than the deadline.
- *Module 5: Finance*: After having a meeting with UN environment team, Mushtaq will be a person who talking care this module if Chula team cannot find any experts to do so.
- *Module 7 Behavioural change and communication*: Still in the process of making decision with team from Janet's suggestion from Singapore, The Behavioural Insights Team. If this team agree to contribute in module, they will also contribute on the last day on SCP academy.
- Due to time constraint, we only have 2 weeks for preparing everything before the event. It would be great if all the key persons can complete the content and provide to Chula team before 16th November 2018.

3.2 Asian circular economy leadership academy and Online application showing case

Brief explanation on what Chula team are going to do on December 2018 was demonstrated to all contributors, in order to let them see the importance of their contribution on the implementation. This section, contributors also selected and nominated who would be a facilitator on each module. A list of facilitators is showed below.

Facilitators on Asian circular economy leadership academy

Module	Facilitator
Module A: Introduction to Circular Economy	UN environment
Module B: Innovation and technology	Prof. Dr. (Anthony) Shun Fung Chiu
Module C: Finance	Pending
Module D: Policies	Assoc. Prof. Dr. Wang Tao
Module E: Business modules	Asst. Prof. Dr. Ritika Mahajan
Module F: Behavioural Change and Communication	Pending with The Behavioural Insights Team from Singapore

3.2.1 Online application demonstration

The Asian circular economy leadership academy will use a mobile application, Uniquizz, as a tool for providing all the contents and reading materials of each module to the participants. Besides, participants can review what they learned by answering quizzes of each module, do the survey for this event, ask questions of what they are curious related to Circular Economy and more.

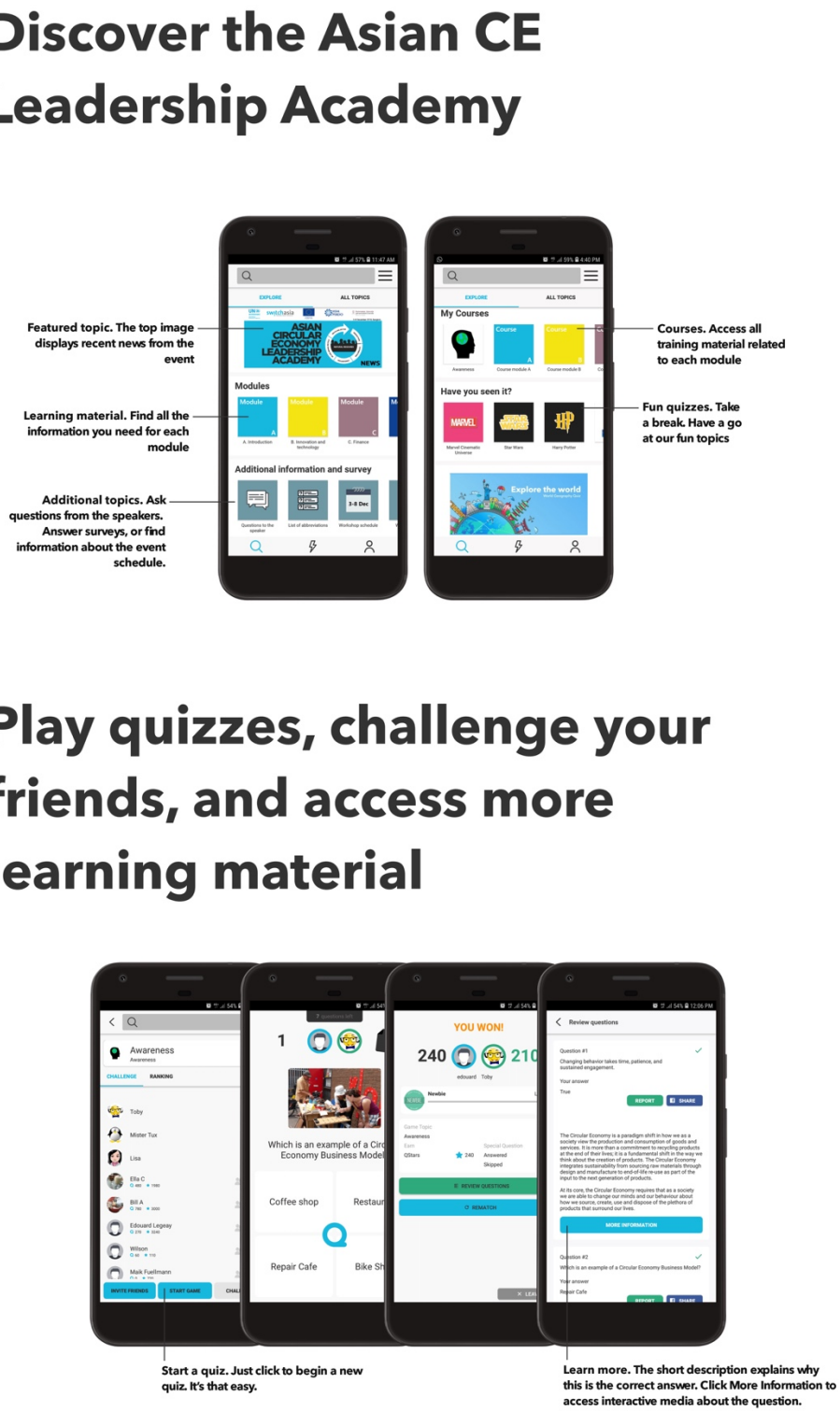

Figure 1: Structure and features of the app

3.2.2 Suggestions for the effectiveness of event organization

- *Ms. Janet's suggestion*: Participants should come with their own problems/issues related to each module of this event and find the solutions after learning with facilitators. Facilitators are also expected to give the participants some suggestions or information to their solutions to make it more reliable and solvable for each problem.

- *Prof. Anthony's suggestion*: To show what the participants are doing now in their hometown, participants should also come with the concept paper based on their backgrounds and present them to facilitators and other participants.

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REGIONAL POLICY ADVOCACY

Funded by the European Union

Self assessment questionnaire on learning - Results

ASIAN CIRCULAR ECONOMY LEADERSHIP ACADEMY

3rd - 8th December 2018
Chulalongkorn University
Bangkok, Thailand

Co-hosted by

UN environment
United Nations Environment Programme

HSM PERDO

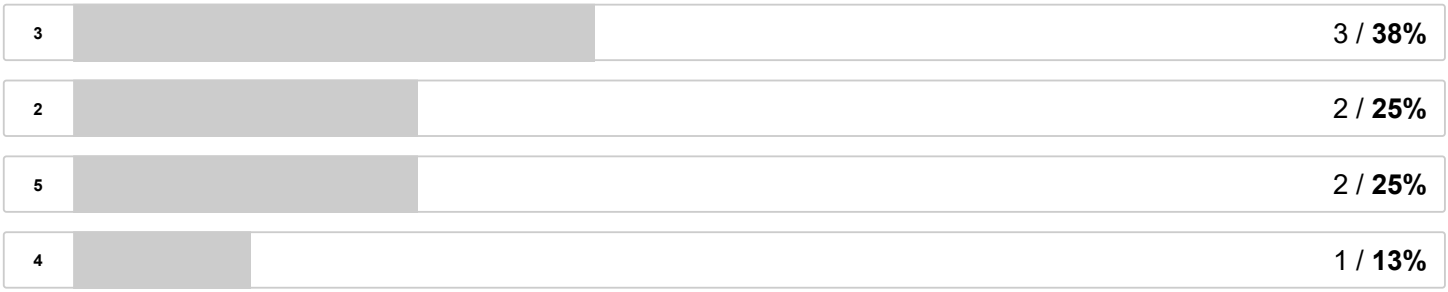
Chulalongkorn University
จุฬาลงกรณ์มหาวิทยาลัย
Pillar of the Kingdom

I clearly understand what circular economy is and how it contributes to sustainable production and consumption. I am encouraged to improve my skill to implement knowledge into practice.

8 out of 18 people answered this question

Average: 3.38

Low High

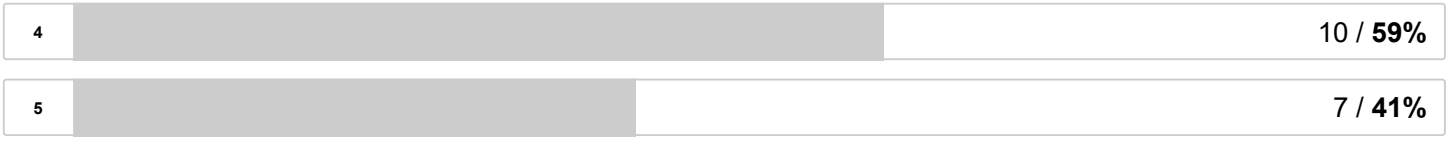


I clearly understand what circular economy is and how it contributes to sustainable production and consumption. I am encouraged to improve my skill to implement knowledge into practice.

17 out of 18 people answered this question

Average: 4.41

Low High



Understand the concept of how innovation and technology can impact in circular economy and sustainable development; and gain knowledge on strategies for innovation in business models which is a requirement in technology adoption.

17 out of 18 people answered this question

Average: 2.82

Low High

3	8 / **47%**
1	3 / **18%**
4	3 / **18%**
2	2 / **12%**
5	1 / **6%**

I understand the concept of how innovation and technology can impact in circular economy and sustainable development; and gain knowledge on strategies for innovation in business models which is a requirement in technology adoption.

16 out of 18 people answered this question

Average: 4.31

Low High

4	11 / **69%**
5	5 / **31%**

I have an understanding of the circular economy finance, core components of circular economy finance, and finance sources for circular business models.

15 out of 18 people answered this question

Average: 2.20

Low High

2	8 / **53%**
3	5 / **33%**
1	2 / **13%**

I have an understanding of the circular economy finance, core components of circular economy finance, and finance sources for circular business models.

17 out of 18 people answered this question

Average: 3.71

Low High

4	9 / **53%**
3	5 / **29%**
5	2 / **12%**
2	1 / **6%**

I understand types of policies and assessment of circular economy policies in a wide range from different scales.

16 out of 18 people answered this question

Average: 2.88

Low High

2	7 / **44%**
4	5 / **31%**
3	4 / **25%**

I understand types of policies and assessment of circular economy policies in a wide range from different scales.

16 out of 18 people answered this question

Average: 3.94

Low High

4	7 / **44%**
3	5 / **31%**
5	4 / **25%**

I acquire a basic understanding of different business models for circular economy, attain the knowledge and skills to evaluate business models for circular economy.

14 out of 18 people answered this question

Average: 2.07

Low High

2	7 / **50%**
3	4 / **29%**
1	3 / **21%**

I acquire a basic understanding of different business models for circular economy, attain the knowledge and skills to evaluate business models for circular economy.

17 out of 18 people answered this question

Average: 3.94

Low High

4	8 / **47%**
3	5 / **29%**
5	4 / **24%**

I understand behavioural drivers behind consumption trends in Asia.

17 out of 18 people answered this question

Average: 3.00

Low High

3	9 / **53%**
2	4 / **24%**
4	4 / **24%**

I understand behavioural drivers behind consumption trends in Asia.

15 out of 18 people answered this question

Average: 4.40

Low High

4	9 / **60%**
5	6 / **40%**

I understand communications actions for behaviour change in Asia.

16 out of 18 people answered this question

Average: 2.94

Low High

3	7 / **44%**
2	5 / **31%**
4	4 / **25%**

I understand communications actions for behaviour change in Asia.

15 out of 18 people answered this question

Average: 4.40

Low High

4	9 / **60%**
5	6 / **40%**

The content of the module A: Introduction to Circular Economy Ms. Janet Salem presented.

17 out of 18 people answered this question

Average: 4.65

Poor Excellent

5	11 / **65%**
4	6 / **35%**

The teaching style of Ms. Janet Salem (Module A: Introduction to Circular Economy).

16 out of 18 people answered this question

Average: 4.75

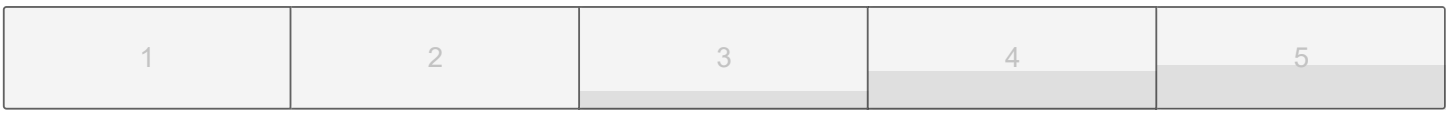
Poor Excellent

5	12 / **75%**
4	4 / **25%**

The content of the module B: Innovation and Technology Dr. Anthony Chiu presented.

16 out of 18 people answered this question

Average: 4.25



Poor Excellent

5	7 / **44%**
4	6 / **38%**
3	3 / **19%**

The teaching style of Dr. Anthony Chiu (Module B: Innovation and Technology).

16 out of 18 people answered this question

Average: 4.38

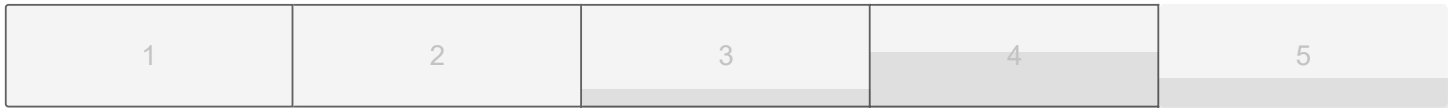
Poor Excellent

5	8 / **50%**
4	6 / **38%**
3	2 / **13%**

The content of the module B: Design Thinking Mr. Maik Fuellmann presented.

17 out of 18 people answered this question

Average: 4.12



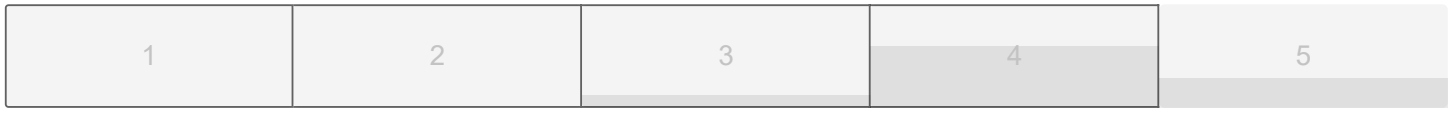
Poor Excellent

4	9 / **53%**
5	5 / **29%**
3	3 / **18%**

The teaching style of Mr. Maik Fuellmann (Module B: Design Thinking).

17 out of 18 people answered this question

Average: 4.18



Poor Excellent

4	10 / **59%**
5	5 / **29%**
3	2 / **12%**

The content of the module C: Finance Prof. Dr. Manipadma Datta presented.

17 out of 18 people answered this question

Average: 3.88

Poor Excellent

4	8 / **47%**
3	4 / **24%**
5	4 / **24%**
2	1 / **6%**

The teaching style of Prof. Dr. Manipadma Datta (Module C: Finance).

16 out of 18 people answered this question

Average: 3.50

Poor Excellent

3	9 / **56%**
4	3 / **19%**
5	3 / **19%**
2	1 / **6%**

The content of the module D: Policies Asst. Prof. Dr. Tao Wang presented.

12 out of 18 people answered this question

Average: 4.08

Poor Excellent

4	8 / **67%**
5	3 / **25%**
2	1 / **8%**

The teaching style of Asst. Prof. Dr. Tao Wang (Module D: Policies).

15 out of 18 people answered this question

Average: 3.87

Poor Excellent

3	6 / **40%**
4	5 / **33%**
5	4 / **27%**

The content of the module E: Business Models Asst. Prof. Dr. Ritika Mahajan presented.

16 out of 18 people answered this question

Average: 3.88

Poor Excellent

4	8 / **50%**
3	5 / **31%**
5	3 / **19%**

The teaching style of Asst. Prof. Dr. Ritika Mahajan (Module E: Business Models).

16 out of 18 people answered this question

Average: 4.13

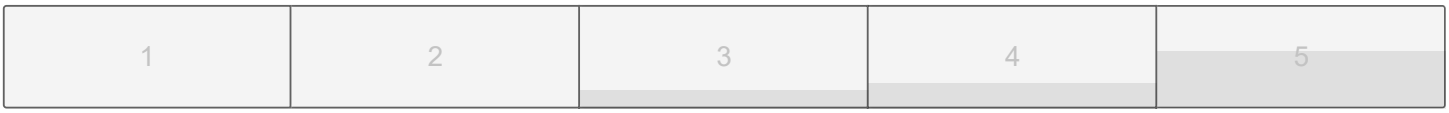
Poor Excellent

4	6 / **38%**
5	6 / **38%**
3	4 / **25%**

The content of the module F: Behavior Change Ms. Janet Salem presented.

16 out of 18 people answered this question

Average: 4.38



Poor Excellent

5	9 / **56%**
4	4 / **25%**
3	3 / **19%**

The teaching style of Ms. Janet Salem (Module F: Behavior Change).

15 out of 18 people answered this question

Average: 4.53

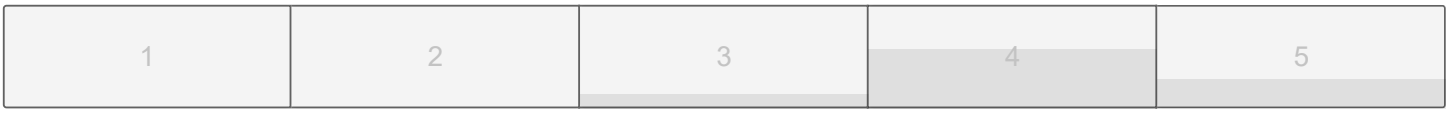
Poor Excellent

5	8 / **53%**
4	7 / **47%**

The content of the module F: Behavior Change Mr. Jacob Holder presented.

14 out of 18 people answered this question

Average: 4.14



Poor Excellent

4	8 / **57%**
5	4 / **29%**
3	2 / **14%**

The teaching style of Mr. Jacob Holder (Module F: Behavior Change).

14 out of 18 people answered this question

Average: 4.43

Poor Excellent

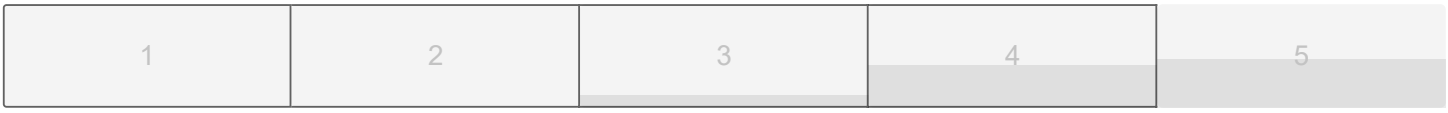
4	8 / **57%**
5	6 / **43%**

Content

Usefulness and applicability of the content for your functions within your organization or your work

17 out of 18 people answered this question

Average: 4.35



Poor Excellent

5	8 / **47%**
4	7 / **41%**
3	2 / **12%**

Agenda and available time for the workshop

17 out of 18 people answered this question

Average: 3.59

Poor Excellent

4	8 / **47%**
3	5 / **29%**
2	2 / **12%**
5	2 / **12%**

The workshop material, power point presentations

16 out of 18 people answered this question

Average: 4.50

Poor Excellent

4	8 / **50%**
5	8 / **50%**

The project concepts

15 out of 18 people answered this question

Average: 4.33

Poor Excellent

4	10 / **67%**
5	5 / **33%**

The debates

17 out of 18 people answered this question

Average: 4.06

Poor Excellent

4	8 / **47%**
5	5 / **29%**
3	4 / **24%**

Extent to which the workshop achieved its objectives

15 out of 18 people answered this question

Average: 4.33

Poor Excellent

4	10 / **67%**
5	5 / **33%**

Level of training (issues covered and explanation of technical issues)

17 out of 18 people answered this question

Average: 4.24

Poor Excellent

4	9 / **53%**
5	6 / **35%**
3	2 / **12%**

Online platform

Usefulness of the content of the mobile training application? (Modules, Quizzes, etc...)

16 out of 18 people answered this question

Average: 4.56

Poor Excellent

5	9 / **56%**
4	7 / **44%**

Are there features you were missing?

8 out of 18 people answered this question

1	No 8 / **100%**

Overall, how satisfied are you with the performance of the mobile application?

16 out of 18 people answered this question

Average: 4.38

Poor Excellent

4	10 / **63%**
5	6 / **38%**

Logistics

Venue and technical facilities

16 out of 18 people answered this question

Average: 4.44

Poor Excellent

4	9 / **56%**
5	7 / **44%**

Pre-workshop arrangements

14 out of 18 people answered this question

Average: 4.50

Poor Excellent

4	7 / **50%**
5	7 / **50%**

On site support

16 out of 18 people answered this question

Average: 4.50

Poor Excellent

4		8 / **50%**
5		8 / **50%**

Overall how satisfied are you with the Asian Circular Economy Leadership Academy?

17 out of 18 people answered this question

2.82 Average rating

1	☆☆☆	14 / **82%**
2	☆☆	3 / **18%**

Would you suggest to UNEP to continue organizing this Asian Circular Economy Leadership Academy

8 out of 18 people answered this question

1	Yes	8 / **100%**

Verification Statement for Carbon Footprint of the Event

Verification body, School of Energy and Environment, University of Phayao by Dr.Surat Sedpho and Dr.Napat Jakrawatana, has verified carbon footprint of the event, Asian Circular Economy Leadership Academy, on September 25th-26th, 2018 and December 3rd-8th, 2018 at Chulalongkorn University, Bangkok organizing by SWITCH-Asia, United Nations Environment Programme and Chulalongkorn university. Level of assurance is limited assurance. Verification has been conducted base on the scheme under "The guideline for carbon offsetting for carbon footprint of the event" by Thailand greenhouse management organization. The verification process has finished on January 28th, 2019

1. Objective of Verification

- To disclose greenhouse gas emission of the event for the evaluation of a greenhouse gas assertion against agreed verification criteria
- To offset greenhouse gas emission from the event for social responsibility

2. Scope of the verification

Scope of the verification includes all greenhouse gas emission sources listed in "The guideline for carbon offsetting for carbon footprint of the event" by Thailand greenhouse management organization. The scope include greenhouse gas under the operational control of organizer of "Asian Circular Economy Leadership Academy event" including GHG emission from food preparation, travel of participant and staff, transportation of participant, accommodation, electricity, brochure and other related document and waste. Carbon footprint report was prepared by Center of Excellence on Hazardous Substance Management (address: Chulalongkorn research building floor 8 Phayathai road Patumwan Bangkok). Verifier has verified GHG assertion and calculation in the carbon footprint report based on activities of the event on September 25th-26th, 2018 and December 3rd-8th, 2018 at Chulalongkorn University, Bangkok. Level of assurance is limited assurance with materiality ± 5%

3. Verification method

Verification method can be classified into 2 steps as follow:

1. Assessing the report and calculation spreadsheet to assess the appropriateness of selected GHG estimation and quantification methodologies. Assess the completeness, relevance, conservativeness and consistency of the GHG estimation.

2. Site visit for collection of evidence and crosschecking GHG information. Then conduct assessment against verification criteria and evaluation of the GHG assertion using both evidence and calculation spreadsheet taking into consideration completeness, relevance, conservativeness, consistency, accuracy and transparency of the GHG information and GHG assertion, including origin of the raw data.

4. Conclusion of verification

Based on the process and procedures conducted, there is no evidence that the GHG assertion is not materially correct and is not a fair representation of GHG data and there is no evidence that the GHG assertion has not been prepared in accordance with the related GHG standard scheme on GHG quantification, monitoring and reporting. The emission estimates were calculated in a consistent and transparent manner and were free from material misstatement.

School of Energy and Environment, University of Phayao, has verified carbon footprint of the event "Asian Circular Economy Leadership Academy" reported by Chulalongkorn University as following:

Carbon footprint from food preparation	0.63	tons of CO_2e
Carbon footprint from travel of participant and staff	22.62	tons of CO_2e
Carbon footprint from transportation of participant	0	tons of CO_2e
Carbon footprint from accommodation	1.53	tons of CO_2e
Carbon footprint from electricity	1.26	tons of CO_2e
Carbon footprint from brochure and other related document	0.09	tons of CO_2e
Carbon footprint from waste	0.13	tons of CO_2e

The total verified carbon footprint of the event "Asian Circular Economy Leadership Academy" to be certified by Thailand greenhouse management organization is **26.25** metrics tons of CO_2e

5. Limitation

-

Issued by

(Dr.Surat Sedpho)
School of Energy and Environment
University of Phayao
Tombon maeka Muang Phayao

Issued date 28 January 2019