

# Workshop Summary Report

## APEC Capacity Building Workshop to Promote MSMEs' Implementation of Circular Economy in Manufacturing Industries

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APEC Small and Medium Enterprises Working Group

December 2024



**Asia-Pacific  
Economic Cooperation**





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# **APEC Capacity Building Workshop to Promote MSMEs' Implementation of Circular Economy in Manufacturing Industries**

**APEC Small and Medium Enterprises Working Group**

**December 2024**

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**APEC CAPACITY BUILDING WORKSHOP TO PROMOTE MSMEs’  
IMPLEMENTATION OF CIRCULAR ECONOMY IN  
MANUFACTURING INDUSTRIES**

*Ha Noi, Viet Nam*

*20 – 21 June 2024*

**Workshop Summary Report**

**I. Introduction**

On June 2024, the “*APEC Capacity Building Workshop to promote MSMEs’ Implementation of Circular Economy in Manufacturing Industries*” was held in Hanoi, Viet Nam. The project was led by Viet Nam and co-sponsored Brunei Darussalam; Chile; Thailand. Speakers and participants came from the private sector, business associations, international organizations, research institutions, and APEC economies' relevant Ministries and government agencies.

The objective of the “APEC Capacity Building Workshop to promote MSMEs’ Implementation of Circular Economy in Manufacturing Industries” is to improve capacity of APEC economies in promoting SMEs’ implementation of circular economy through identifying and addressing challenges in implementing circular economy in manufacturing. Improving capacity and promoting circular economy would be based on sharing information, experiences in enabling a favourable environment to promote the implementation. It is in line with the Putrajaya Vision 2040, Action Plan of Aotearoa (APA) and the Bangkok Goals on Bio-Circular-Green (BCG), which aim to promote sustainable growth and development in general, circular economy in particular.

## II. Background

According to the World Economic Forum (WEF), we are using approximately 60% more of the earth's resources than it can generate every year and it is estimated that with an increased global population, that "overshoot" could result in the utilization of the equivalent resources of three earths by 2050.<sup>1</sup> According to a UN Report, extractive industries are responsible for half of the world's carbon emissions and more than 80% of biodiversity loss.<sup>2</sup> The world needs a sustainable approach to "minimize the use of the world's resources, cut waste and reduce carbon emissions". The approach of a circular economy would play a significant role in reducing the use of precious raw materials and cutting CO2 emissions (WEF).<sup>3</sup> In that sense, the implementation of a circular economy in manufacturing would be very meaningful to sustainability given the fact that total material extraction has more than tripled since 1970 and almost doubled since 2000, putting it at 100 billion tons per year.<sup>4</sup> In manufacturing, circular economy can be considered in four cornerstones, namely 4 Rs: Reduce, Refurbish/Reuse, Recycle, and Recover.<sup>5</sup> In practice, the amount of secondary materials being cycled back into the global economy has shrunk from 9.1% of total material inputs in 2018 to 7.2% in 2023, which is downward in the trend as well as a potential to promote the implementation of circular economy.<sup>6</sup>

The implementation of circular economy in manufacturing requires holistic changes in core production, supply chain processes, logistics process, involvement of customer interaction, data collection on volume forecast for the return of used products, etc., which will require further sharing of information and experiences in enabling environment for policy promotion, implementation to promote SMEs' implementation.

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<sup>1</sup> <https://www.weforum.org/agenda/2021/10/7-surprising-facts-to-know-about-the-circular-economy-for-cop26/>

<sup>2</sup> <https://www.theguardian.com/environment/2019/mar/12/resource-extraction-carbon-emissions-biodiversity-loss>

<sup>3</sup> <https://www.weforum.org/agenda/2022/06/what-is-the-circular-economy/>

<sup>4</sup> <https://www.weforum.org/agenda/2022/06/what-is-the-circular-economy/>

<sup>5</sup> <https://www.strategyand.pwc.com/de/en/industries/industrials/importance-of-the-circular-economy-for-manufacturing.html>

<sup>6</sup> <https://www.weforum.org/agenda/2022/06/what-is-the-circular-economy/>

The project would focus on identifying and addressing the challenges through promoting sharing information and experiences in SMEs implementing circular economy in manufacturing. The project would benefit APEC member economies given the fact that APEC is pursuing to sustainable and inclusive growth and development through the Bangkok (BKK) Goals on Bio-Circular-Green Economy (BCG).

The project is in line with the Putrajaya Vision 2040 and the Aotearoa Plan of Action (APA) that commits to supporting global efforts to comprehensively address all environmental challenges, for a sustainable planet through promoting sustainable growth across sectors of cost effective, low and zero emission technologies. The circular economy in manufacturing significantly contributes to the zero emission targets and sustainability.

The project is also in line with the BKK Goals on BCG, which aim to advance resource efficiency and sustainable waste management towards zero waste through increasing cooperation to advance circular economy approaches, including through promoting circular business models as well as exchange policies and best practices, and sustainable production and consumption patterns. The project would promote circular economy through promoting sharing of information and experiences.

While SMEWG strategic plan aims to realize the Putrajaya Vision 20240 and the Aotearoa Plan of Action (APA) that includes promotion of economic policies, cooperation and growth, “which will support global efforts to comprehensively address all environmental challenges”, for a sustainable planet, circular economy would contribute as a sustainable approach to promote APEC’s innovation and sustainable growth and development.

The project contributes to pursuing APEC goals for capacity building in promoting circular economy in manufacturing for SMEs in APEC member economies, especially for developing ones, which aims to attain sustainable



growth and equitable development in the Asia-Pacific region. It would also contribute to the objectives to promote APEC member economies' capacity in implementing the BKK Goals on BCG.

### **III. Key Issues**

#### **1. Overview of MSMEs' implementation of circular economy including those in manufacturing industries**

*Ms Hoang Thi Dieu Linh, Waste and Circular Economy Program Officer, Climate Change and Environment Unit (CCEU), United Nations Development Program (UNDP) Viet Nam:*

In Viet Nam, efforts to promote circular economy transition has been in place with the ambitions and commitments by the Vietnamese Prime Minister at the Partnering for Green Growth and the Global Goals 2030 (P4G) Summit, the UN Climate Change Conference in Glasgow (COP 26), facilitating the implementation of circular economy transition. The 2020 Law on Environmental Protection (LEP 2020) set the institutional basis for the development of circular economy models, and the Decree 08/2022 specifies the implementation of LEP 2020 including criteria guiding the adoption of the circular economy principles, financial incentives, and a roadmap for implementation of circular economy. Viet Nam also issued the Master Plan on Circular Economy in June 2022, calling for raising awareness of business and enhancing policies and business models to facilitate circular economy development in prioritized sectors. The Action Plan on Circular Economy, led by the Ministry of Natural Resources and Environment (MONRE), set out tasks and roadmap covering specific fields and industries, investment projects, and prioritized solutions.

On the other side, business still face barriers in adopting circular economy models due to a lack of guidelines to support businesses understand steps to adopt circular economy practices; limited access to innovative and modern technologies combined with SMEs low capacity; a lack of successful and inspiring pilot projects

demonstrating costs and benefits of circular economy over the linear business as well as a lack of localized waste management systems.

UNDP Viet Nam has been actively involved in promoting business transition to circular economy models. They have provided technical policy advisory in developing definition of circular economy in LEP and Social Economic Development Strategy (SEDS); the Decree 08/2022 and the development of Viet Nam Action Plan for Circular Economy. Viet Nam has developed Circular Economy Hub to enhance dialogue, generate know-how, and mobilize collective action towards the circular economy transition, including launching circular cities to facilitate gradual transition such as developing the concept, roadmap, responsible sourcing framework, material recovery framework; designing just energy transition such as promoting green e-transportation and adoption of energy efficiency in buildings; promoting circular economy design; promoting circular design including developing training programs for SMEs, stewardship group, etc.

***Mr Lai Van Manh, Division Head, Institute of Strategy and Policy on Natural Resources and Environment (ISPONRE), Ministry of Natural Resources and Environment (MONRE), Viet Nam:***

The speaker focused on legal framework of promoting circular economy transition. Before 2016, the term “circular economy” had not been stated officially in Viet Nam’s legal frameworks. Since 2016, circular economy has been embedded in the Party and Government’s policies, including incorporated in the Economic – Social Development Strategy 2021 – 2030; and the Economic – Social Development Plan 2021 – 2025. Circular Economy is regarded as a key pillar in Viet Nam’s development orientation for sustainable energy; and in Viet Nam Action Plan in Manufacturing and Consumption for the period 2021 – 2030. In June 2022, Viet Nam launched the Master Plan on Developing Circular Economy in Viet Nam, which aims to reduce greenhouse gas emissions; increase awareness and interest of domestic and foreign enterprises and investors’ investment into the circular

economy model; promote the application of the circular economy model to foster greening of economic sectors; support the development of a green lifestyle, and encourage waste classification and promote sustainable consumption; as well as improve the quality of life and resilience of people to climate change, ensuring equality in conditions and opportunities to develop capacity, improving labor productivity and income of workers from the circular economy.

MONRE plays an important in launching the roadmap to promote circular economy. They develop the Viet Nam Action Plan, which identifies general and specific missions for industries and sectors; identifies modes of investment projects, designs and criteria to comply with circular economy models; develops solutions for adoption of circular economy models; as well as assigns, allocate resources, supervises and reports the implementation. The Action Plan includes developing a platform to connect information and share data on applying the circular economy models; as well as issuing a framework to guide the adoption of circular economy. Under the roadmap, ministries and provincial people committees are in charge of developing their own action plans to implement circular economy, embedding specific criteria of circular economy into their economic plans, implementing pilot models of circular economy, disseminating information and law related to implementing circular economy, and manage and update information and data on circular economy implementation and integrate with the data information system of MONRE.

Enterprises should take a more active roles in implementing the Action Plans including those of the whole economy, relevant ministries and Provincial People's Committees; designing the overall optimal layout to improve efficiency and reduce consumption of land, water and energy resources; applying environmental friendly transportation solutions, reducing greenhouse gas emissions; taking advantage of roof space to develop rooftop solar energy; collecting and storing rainwater for reuse; recover and reuse treated wastewater; implementing solutions on domestic solid waste management in accordance with the provisions of the Law

on Environmental Protection; and encouraging the application of circular economy models even earlier than the roadmap specified in the State's action plan. Sectors are specifically encouraged to pursue circular economy models such as agriculture, forestry, wood processing and fisheries; energy; mineral exploitation and mineral processing; processing and manufacturing industry; chemicals; construction and transportation; waste management; and other intermediary services and fields (tourism, trade, etc.,).

## **2. Identifying challenges and approaches to promote MSMEs in manufacturing to implement the circular economy**

***Mr Harith Ridzuan, Chief Executive Officer, One-Tech (M) Sdn Bhd, Malaysia:***

Established in 2012, The Green Factory (TGF) is Malaysia's pioneering manufacturer of sustainable wood products through developing expertise in interior design, furniture, homeware, and gift products. Located in Ampang, Selangor, TGF adopts a circular approach to the sustainable production of timber products, covering aspects in green manufacturing such as sourcing of eco materials, green design, green building, system efficiency, waste management and education.

Since 2017, they have started to welcome visitors (students, school children, tourists, shoppers, corporations, industry leaders and associations, etc.,) to experience their concept factory, where they demonstrate the various steps taken in operating a 'green' factory. Facing with challenges when pioneering in circular approach since very early, they increasingly understand the importance of education to raise awareness and hence promote the adoption of circular economy models. In that sense, The Green Factory focuses on advocating for sustainable production and consumption through learning programs and public outreach, which aims to make Malaysians become a more conscious society.

*Assoc. Prof. Dr Nguyen Hong Quan, Member of the Council Board, Director, Institute for Circular Economy Development (ICED), Viet Nam National University – HCMC (VNU-HCM), Viet Nam:*

Despite many challenges, circular economy has huge potential for further development in Viet Nam. In pursuit of the Government's carbon-neutral goal by 2050, Viet Nam has accelerated their efforts to promote the adoption of circular economy in various areas. For example, they focus on promoting renewable energy (biomass, wind, water, hydrogen, wastewater, solid waste, etc.); integrating infrastructure development, transport, agriculture based on renewable energy; as well as promoting green finance and carbon market.

Circular agro ecology is launched to gradually transform agriculture into a more sustainable and green manner, which has positive impacts on agro ecological farming system, product chains and green market through affecting resource use, and hence, contributing to improving livelihood, and socio-economic growth.

Another example is the promotion of circular economy among industrial parks, which contributes to preventing environmental pollution through sharing energy, transportation, logistics, and labor, etc. With the promotion of green and smart infrastructure (transportation, seaport, IoT, etc.), it can contribute to promoting wide adoption of circular economy since it contributes to promoting other aspects of circular economy such as from inputs (raw recyclable materials/production) to green outputs.

Tourism is also one among sectors to promote circular economy. For instance, in Viet Nam, they develop Con Dao island into a world-class sustainable tourist destination with circular economy approach based on the State agenda on green growth and circular economy, strong political willingness and commitments from the local authorities, as well as close sectoral collaboration among the local authorities, private and academia. Similarly, green economy cities are promoted in a holistic approach from developing green infrastructure (transportation),

integrating urban - rural – industrial, urban agriculture (food, social security, psychological health, etc.). Among those efforts are concrete activities to promote circular economy such as living labs, open community, innovation, starts-up for circular economy, and so on.

To sum up, while challenges are prominent, Viet Nam embraces opportunities to promote wide application of circular economy due to strong political willingness and commitments from the central government to local authorities, and concrete action to promote circular economy.

### **3. Promoting innovation to promote the circular economy in manufacturing MSMEs**

*Ms Nantaphorn Aungatichart, Director, Organizational Development Strategy and Research Division, Thailand Productivity Institute (FTPI), Thailand:*

The Thailand Productivity Institute (FTPI) is a network institute under the Ministry of Industry. It functions to help increase the competitiveness of the Thai industry and services sectors, FTPI provides a wide range of services such as consultation, training, research, and cooperation and academic exchange with international networks as well as schemes to promote productivity in every aspect of Thai society with the fundamental belief that “systematic productivity enhancement will lead to Thailand’s sustainable development.”

FTPI provides services of consulting, coaching, training and organizational assessment with a wide range of expertise, such as in production management, organization management, and business management for sustainability.

They focus on promoting productivity research to enhance the competitiveness at the corporate, industrial and whole-economy level, which consist of research studies for strategic planning, potential development and upgrading of the organization, evaluation of organization/project/plan performance, as well as developing a database and providing knowledge and indicators.

To support and facilitate enterprises, PTPI provides self-interactive assessment that can be done online and receive immediate results. It is a preliminary gap analysis, which can help organizations know their current situation trends and assist in planning and developing the organization.

PTPI has been appointed by the government to be the Thailand Quality Award (TQA) Secretariat Office. The award serves as an important mechanism to increase the potential of Thai organizations by encouraging public and private organizations in all sectors to adopt the award criteria to develop the organization in order to meet international standards. TQA is a world-class award based on the same technical and judging process as the Malcolm Baldrige National Quality Award (MBNQA). Award criteria have been used as the foundation and model for the development of many other award criteria, such as Education Criteria for Performance Excellence EdPEX, SME National Awards, etc.

In APEC, Thailand has pioneered the Bangkok Goals on Bio-Circular-Green Economy (BCG), launching it as a new sustainable growth engine for sustainable and inclusive growth and development through promoting reuse, refurbish, sharing, recycle, upcycle, zero waste. In pursuit of circular economy approach, MSMEs might encounter a number of challenges such as incurring high upfront costs because of circularity practices; shortage of workers with circularity skills in the market; risk of changing to innovative circular business models.

However, they increasingly understand the importance of promoting circular economy approach since MSMEs form the backbone of many economies, driving employment, innovation, and economic dynamism. Harnessing their potential to transition towards circularity holds immense promise not only for ecological preservation but also for enhancing competitiveness and resilience.

Deesawat is an example among MSMEs making concrete efforts to promote circular economy model through making their designing focus on sustainability that is environmentally friendly and better for the world; promoting green factory

throughout the production process, taking into account environmental considerations whether it be materials, paint or wood glue; recycling back to use remaining wood scraps and other materials if applicable; and creating a network to forward customers together as a network.

***Mr Lai Van Manh, Division Head, Institute of Strategy and Policy on Natural Resources and Environment (ISPONRE), Ministry of Natural Resources, and Environment (MONRE), Viet Nam:***

The speaker focused on roles of digital transformation into circular economy in general, waste management in particular. Circular economy can be harnessed based on the efficient application of Information and Communication Technology (ICT), Internet of Things (IoT), simulation, data analytics, robots, augmented reality, AI, cloud computing, modular design technology, advanced recycling technology, monitoring and surveillance systems, 3D printing technology, and so on, which contribute to promoting greener design and cleaner manufacturing. On the other hand, shift in consumption patterns also results in development of environmental-friendly industrial parks and clusters as well as other outburst of services such as hiring, designing or repair, etc.

With changes in consumption and rising awareness, waste management can be developed in line with circular economy approach with the development of recycling systems, and waste-handling factories. In that line, markets for waste and secondary raw materials have potential for development, especially in symbiotic urban areas.

***Mr Vu Van Phu, Deputy Chairman, Viet Nam Aluminium Association (VCA), Viet Nam:***

The speaker shared the experiences in promoting and adopting digitalization in Viet Nam aluminium industry and recognizes how digitalization makes great contribution to the development and survival of the industry in the context of increasingly harsh competition in both domestic and external markets. In Viet



Nam, aluminium has a large inventory, therefore, management and control of inventory might be time consuming and require a certain source of human resources. The uptake of technological advances in the industry is rather limited, undermining Viet Nam's aluminium enterprises' competitiveness. The outburst of the Covid 19 pandemic triggered both challenges and opportunities. In face of disruption and increasing competition, aluminium enterprises recognize that digital transformation and circular economy approach will help to reduce costs and increase management efficiency at the same time. They are aware of and focus efforts on using recycled materials, shifting energy system into renewable energy to reduce manufacturing cost. They harness digitalization to improve data management, waste management and delivery efficiency, which contribute to improving enterprises' disciplines, workers' behaviour patterns, and hence, to improve enterprises' performance and competitiveness. It is emphasized that although human resources might be cut but it is the human resource that make digital transformation successfully, otherwise, it is just the installation of software but no actual efficiency.

***Ma. Camille M. De Leon, Trade-Industry Development Analyst, Department of Trade and Industry (DTI) – Bureau of SME Development, the Philippines:***

Despite challenges of limited infrastructure, low public awareness and limited investment in green technologies, the Philippines support the adoption of circular economy through issuing the Ecological Solid Waste Management Act (RA 9003), the Circular Economy Promotion Act (HB 8791), Renewable Energy Act of 2008 (RA 9513), Sustainable Forest Management Act (HB 7408), Extended Producer Responsibility (EPR) Act of 2002.

Under the Bureau of Small and Medium Enterprise Development (BSMED), DTI is particularly responsible for promoting circular economy approach. They aim to support and develop MSMEs through developing strategic programs, namely Green Economic Development (GED) Program, and Global Initiative Reporting

(GRI). Through collaborating with local governments, private sector and organizations, they provide capacity building (training, workshops, etc.) and financial support (grants and loans for green technologies) to help eco-friendly MSMEs gain market access.

DTI have launched specific projects to promote circular economy approach such as the community plastic station project in Baliwag and tend to scale up by expanding successful projects. In parallel with increasing public awareness and participation, they aim to promote innovation and research as well as provide policy support to strengthen the adoption of circular economy.

#### **4. Exploring mechanism to promote MSMEs' adoption of circular economy with a focus on manufacturing industries**

*Mr Nguyen Minh Ke, Chairman, Viet Nam Aluminium Association, Viet Nam:*

It is increasingly recognized that recycling aluminium reduces the need for bauxite mining, contributing to a sustainable circular economy. Aluminium production from aluminium scrap consumes only 5% of the energy compared to production from ore; and greenhouse gas emissions are only 8 - 10%. Recycling aluminium helps make more use of raw materials, reducing the cost of raw materials for the life cycle of new products, and reducing CO2 tax. Aluminium scraps are collected by people and sold to scrap collectors to be transferred to gathering points and finally to recycling facilities. The collection system is spontaneous but effective due to its high economic value (e.g. over USD2/kg).

In 2022, Viet Nam imported 220,000 tons of scrap aluminium, which is classified according to its criteria such as purity, alloy composition, and size. There are currently about 20 factories engaged in industrial-scale recycling and more than 300 small-scale manual recycling households, mainly located in Bac Ninh province in the north of Viet Nam.

Collecting and recycling aluminium is believed to be one of important ways, contributing to reducing pollution, as well as the amount of waste released into the

environment. Aluminium recycling processes go combining with effective waste water treatment systems, to avoid pollution of water sources.

Currently, recycled raw aluminium is “green aluminium”, which comes with carbon credits that the manufacturer earns from recycling, helping businesses to achieve the Net-zero target. “Green aluminium”, or low-carbon aluminium remains an inevitable trend of major markets that Vietnamese manufacturers are pursuing for a sustainable growth and development in the long term.

***Mr Nguyen Anh Duong, Director, Department for General Economic Issues and Integration Studies, Central Institute for Economic Management (CIEM), Viet Nam:***

In the context of prominent free trade agreements (FTAs), economies are inevitably joining in the regional economic integration (REI). In that trend, trade and sustainable development are of increasing concern. Green development has been high on agenda with the COP26 and commitments to reducing emissions as well as pursuing green growth and energy transition. Under this course, green transition focuses on economic recovery process rather than recovery using old economic models; and circular economy and climate-resilient economic models are increasingly prominent, forcing all stakeholders to join in deeply. In that line, MSMEs needs to be incentivized, rather than just compelled to comply with new standards and regulations to compete efficiently in the markets.

It is widely recognized that policy mindset towards “economic aspects” of circular economy is important and that adoption of circular economy helps foster economic diversification and access to higher-value market segment. In this process, international cooperation is essential to promote sharing experiences, best practices and/or lessons to promote circular economy.

## **5. Identifying resources to strengthen capacity building and skills development**

*Ms Song Xiaoming, Director, Center for International Economic and Technological Cooperation, Ministry of Industry and Information Industry (MIIT), China:*

MIIT launches a Public Service Platform for MSMEs to support MSMEs in a variety of areas such as promotion of international economy and trade, digital economy, emerging industries, green and low-carbon sectors, and other areas such as support for the performance of chemical weapons convention, research on cooperation of industry and finance, monitoring and analysis of industrial relocation, research on international cooperation in silk industry, etc. To promote high-quality development of MSMEs, they make efforts to strengthen policy support, service provision, and core competitiveness of MSMEs with the aid in green procurement, green upgrading for MSMEs through training, technical assistance, finance support, etc.

The Center for International Economic and Technological Cooperation (CIETC) specifically focuses on green and low-carbon sectors such as support for the evaluation of green supply chain management enterprises, compilation of green supply chain management standards, MIIT's carbon peak and neutrality platform for the raw material industry, research on international cooperation in energy electronics. Since SMEs plays an important pillar, they focus on building public service demonstration platforms for SMEs, promoting research on international cooperation among small and medium specialized and sophisticated enterprises that produce new and unique products, research on international cooperation among SMEs clusters, promoting "Digital Empowerment" advanced training program for leading talents in SME management, "Digital Open Cooperation Service of Manufacturing Clusters in the Neighbourhood", etc.

With the launch of the "13th Five-Year Plan" and "14th Five-Year Plan", China has outlined the implementation of green manufacturing as an inevitable choice for the green and sustainable development of manufacturing with revising more than 500 standards related to green manufacturing, and developing and releasing promotion catalogs for green manufacturing-related technologies.

In pursuit of green manufacturing, at the economy level, China has developed 371 green industrial parks, 605 green supply chain management enterprises, and nearly 35,000 green products. At local levels, they have developed 6,000 provincial and municipal green factories, nearly 300 green industrial parks, and nearly 200 green supply chain management enterprises.

***Dr Chika Aoki-Suzuk, Senior Researcher, Institute for Global Environmental Strategies (IGES), Japan Partnership for Circular Economy (J4CE) Secretariat:***

Japan has launched the Circular Economy Vision aiming to envisage a comprehensive future vision for upstream industry. Under this effort, a robust policy framework named Sound Material Cycle Society (SMCS) has been launched for further implementation. Based on that, they have developed the 4<sup>th</sup> Japan's plan for circular economy to implement the SMCS, which focuses on: (i) plastic resource circulation strategy; (ii) biomass (food loss and waste); (iii) metal; (iv) construction (long life construction); and (v) emerging topics (solar power generation, etc.). Among that, plastic is one of Japan's priorities and they developed the Plastic Resource Circulation Strategy in 2023.

With efforts to promote the adoption of circular economy from the stage of design, they develop the Act on the Promotion of Effective Utilization of Resources (2001) based on the cores of 3Rs, labelling for sorted collection, promotion of effective utilization of by-products. With regards to recycling, they have both the Act on the Promotion of Effective Utilization of Resources, focusing on collecting, recovering and recycling of used products (PC, specific small battery, etc.); and

the Act on Advanced Resource Circulation with wider-area separate collection and recycling projects, promoting advanced separation and recovery technologies, introduction of high-efficiency equipment for decarbonisation. With regards to consumption, they also have Green Purchasing Act (public procurement of recycled items).

Japan has developed the Waste Management and Public Cleansing Act since 1971 with aims to reducing waste generation, promoting proper treatment of waste (including recycling), developing regulation for waste treatment facilities, and regulation for waste treatment operators, establishing waste treatment standards, etc.

J4CE makes great efforts to promote capacity building to implement the circular economy, including disseminating and sharing information domestically and internationally; forming network on circular economy to create an enabling environment for business development of J4CE members; as well as promoting circular economy through dialogue (through public-private dialogue) to increase knowledge of the J4CE participants

#### **IV. Discussion, Recommendations and Conclusions**

Through the active sharing of information and experiences at the Workshop, speakers and participants exchanged views on how to MSMEs' implementation of circular economy in manufacturing industries. Recommendations are summarized as below:

##### ***1. Recommendations for manufacturing enterprises***

- Raise awareness for manufacturing MSMEs of the importance and benefits of adopting circular economy.
- Promote access to finance green loans and grants to facilitate their adoption of circular economy models.

- Raise specific requests as well as seek support for technical support and innovation technical assistance, especially customized programs for manufacturing enterprises.
- Promote market access and networking market platforms.

## **2. *Recommendations for APEC member economies/governments***

### *2.1 Policy and Regulation*

- Incentives: Implement tax breaks, subsidies, and other incentives for MSMEs that adopt circular economy practices.
- Regulatory Framework: Develop clear regulations and standards that promote the circular economy, making it easier for MSMEs to comply and benefit.
- Promote remanufacturing and standards harmonization.

### *2.2 Infrastructure and Logistics*

- Recycling facilities: Invest in the development of recycling and waste management infrastructure to support MSMEs in closing the loop on materials.
- Efficient logistics: Improve logistics networks to facilitate the efficient movement of recycled materials and remanufactured products.

### *2.3 Research and Development*

- Funding R&D: Allocate funds for research and development in circular economy technologies and practices that MSMEs can adopt.
- Collaboration with academia: Promote collaboration between academic institutions and MSMEs to foster innovation and practical applications of circular economy principles.

## *2.4 Public Awareness Campaigns*

- Education campaigns: Launch public awareness campaigns to educate consumers about the benefits of the circular economy and encourage the demand for circular products.
- Sustainable procurement: Lead by example through sustainable public procurement practices, prioritizing products and services from MSMEs that follow circular economy principles.

## **3. *Recommendations for APEC as a whole***

### *3.1 Regional Cooperation and Knowledge Sharing*

- APEC Circular Economy Network: Establish a regional network for sharing best practices, success stories, and resources related to the circular economy.
- Collaborative projects: Promote collaborative projects and initiatives across member economies to address common challenges and leverage regional strengths.

### *3.2 Harmonization of Standards*

- Regional Standards: Promote harmonized standards for circular economy practices across APEC economies, making it easier for MSMEs to operate regionally.
- Certification programs: Create certification programs that recognize MSMEs meeting circular economy standards, boosting their credibility and marketability.

### *3.3 Trade Facilitation*

- Reduce trade barriers: Work on reducing trade barriers for circular products and services, enabling MSMEs to access larger markets within the APEC region.



- Support for export: Provide support and resources for MSMEs to export their circular economy products and services, including market research and trade missions.

### *3.4 Capacity Building and Technical Assistance*

- Training programs: Develop regional training programs to build the capacity of MSMEs in adopting circular economy practices.
- Technical assistance: Offer technical assistance and advisory services to help MSMEs implement circular economy initiatives

Hereinabove are some recommendations from the workshop's participants and speakers that require further thoughts and discussions at the upcoming SMEWG meetings to transform into more concrete and practical activities.