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APEC Seminar on Promoting Circular Economy and Sustainable Materials Management to Effectively Address Marine Plastic Litter in the Asia-Pacific Region

APEC Ocean and Fisheries Working Group

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SUMMARY REPORT

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Thi Thu Trang Tran
Project Contractor
Ministry of Foreign Affairs of Viet Nam
2 Le Quang Dao Street, Me Tri Ward, Nam Tu Liem District,
Hanoi, Viet Nam
Tel: (+84) 24 3799 5796
Fax: (+84) 24 3799 5769
Email: apecmofavn@gmail.com

For
Asia-Pacific Economic Cooperation Secretariat
35 Heng Mui Keng Terrace
Singapore 119616
Tel: (65) 68919 600
Fax: (65) 68919 690
Email: info@apec.org
Website: www.apec.org

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INTRODUCTION

On 26– 27April 2022, the ***APEC Seminar on Promoting Circular Economy and Sustainable Materials Management to effectively address marine plastic litter in the Asia-Pacificwas held virtually***, co-sponsored by *Australia; Chile; Hong Kong, China; Japan; Peru; the Philippines; Russia; Chinese Taipei; Thailand; the United States*. The Seminar was held under the APECOcean and Fisheries Working Group with a view to contributing to the implementation of the APEC Viet Nam 2017 Joint Ministerial Meeting commitments and theAPEC Roadmap on Marine Debris, which encourage all member economies and stakeholders, particularly the private sector, to engage in ocean-related cooperation, including investment in sustainable materials management and waste management infrastructure, to reduce land-based sources of marine debris in Asia – Pacific region.

The Seminar gathered about 120 participants, including representatives of related ministries, agencies, experts, scholars, enterprises from APEC member economies, representatives of APEC Ocean and Fisheries Working Group (OFWG) and Policy Partnership on Science, Technology and Innovation (PPSTI),and representatives of international organizations such as International Union for Conservation of Nature (IUCN)(, Ocean Conservancy, World Bank, United Nations Development Programme (UNDP), World Wildlife Fund (WWF), United Nations Conference on Trade and Development (UNCTAD), United Nations Industrial Development Organization (UNIDO), United Nations Economic and Social commission for Asia and The Pacific (UNESCAP). The Seminar was opened by the Remark from Dr. Nguyen My Hang, Deputy Director General of the Department of Science, Technology and International Cooperation, Viet Nam Administration of Seas and Islands, Ministry of Natural Resources and Environment of Viet Nam and Mr Stephan Sicars, Managing Director, Directorate for Environment and Energy, UNIDO.

The main objective of the Seminar was to contribute to APEC efforts in protecting our oceans from land-based debris through promoting circular economy practices and sustainable material management in the region. For that, the project was designed to: (i) address the capacity of economies in promoting circular economy to address marine plastic effectively; (ii) share best practices and innovations of new sustainable materials; packaging and products that use single number of polymers; (iii) identify policy measures to incentivize circular economy practices in design and support innovations and start-ups, particularly those related to new, bio-degradable and compostable plastics; and (iv) develop recommendations encouraging cooperation in potential areas to tackle marine plastic litters, particularly in design phase. Recommendations will be reported to related sub-foras to contribute to the implementation of the 2021 Aotearoa Plan of Action.

KEY ISSUES DISCUSSED

The Seminar was opened by the Remark from Dr. Nguyen My Hang, Deputy Director General of the Department of Science, Technology and International Cooperation, Viet Nam Administration of Seas and Islands, Ministry of Natural Resources and Environment of Viet Nam and Mr Stephan Sicars, Managing Director, Directorate for Environment and Energy, UNIDO.

The two-day Seminar was then divided into 4 sessions.

SESSION 1

The First Session on "Marine plastic pollution – A major global environmental problem" was chaired by MsMorgane Rivoal, Circular Economy and Climate Change Officer, UNDPViet Nam

Ms Bui Thi Thu Hien, Marine and Coastal Program Coordinator, IUCN Viet Nam Office,presented the plastic pollution hot spotting and shaping action and some of Viet Nam results.

According to Ms Bui Thi Thu Hien, Currently, Viet Nam imports most of the plastic it consumes. The average per capita plastic consumption is 81 kg/person/year, of which 58 kg/capita/year go to waste and 23 kg/person/year go to increase the stock (due to high industry growth in recent years). 93% of the waste recycled through formal processes is imported, while the remaining 7% comes from waste generated within the economy (but is recycled in craft villages where proper environmental practices are not applied). More than half of the plastic waste generated in Viet Nam remains uncollected (3.6 Mt/year). This is due to low collection rates outside city centres, high littering rates and open burning of waste prior to collection. In Viet Nam, 453 kt of plastic waste leaked into the ocean in 2018. This is equivalent to a plastic leakage of 4,7 kg/capita/year.

Micro-leakage contributes for 2% of the overall economy leakage. This small contribution of micro-plastics is common for economies where the solid waste is still largely mismanaged. Recycling has not been considered as a source of leakage although informal practices may generate leakage of microplastics. No data was found on this aspect.

Open burning of mismanaged plastic waste in Viet Nam poses significant risks for human health (due to the release of noxious chemical substances such as dioxin and particulate matters) and directly contributes to climate change. Investigate open burning practices and conduct field studies to estimate the amount of mismanaged plastic waste that is burned.

PET is the top contributor in absolute leakage (112 kt), with a leakage rate of 11%. More than one in ten of PET put on the market leaks to the ocean. Plastic bags are by far the highest contributors in absolute leakage (244 kt) and rank 2nd in leakage rate (12%). They are highly harmful to marine life. Lids and caps are 2nd in absolute leakage (18 kt) with a 12% leakage rate. Boxes and crates are the 3rd highest contributor in absolute leakage (17 kt) and are harmful to marine life.

There are several priority interventions such as: Reduce import and export of plastic waste; Promote design of material or process that substitute plastic by other material based on life cycle assessment; Increase plastic segregation at household level; Ensure plastic waste has a enough value to cover collection costs; etc.

Ms Vien Tran, Viet Nam Senior Manager at Ocean Conservancy presented the current management of seafloor marine litter.

Ms Vien Tran has introduced briefly about Ocean Conservancy and the firm's network and activities. She has highlighted supporting practices in combating marine debris in Viet Nam in terms of four groups: Accelerating Efforts to reduce ocean plastic in Viet Nam; Urban Ocean; Strategic Plastic Litter Abatement in Song Hong;

Advancing Solutions to Plastic Pollution through Inclusive Recycling.

She has shared a lesson learn from a trash capture device which has worked affordably and effectively with 100% locally designed, sourced and constructed. She also shared the model as the circularity assessment Protocol (CAP). CAP is a hub and spoke model that provides a snapshot of a city's circularity that can provide data for policy decision-making to reduce leakage of waste (e.g., single-use plastic) into the environment and increase circular materials management.

In term of communication Outreach, there are several platforms such as communication board, blogs, articles, events, coastal cleanup or videos on increasing public awareness on marine plastic debris and support behavior change.

Ms Anjali Acharya, Senior Environmental Specialist, World Bank presented the regional solutions on addressing marine plastic impacts

There is growing regional and global momentum. United Nation Environment Assembly have endorsed the resolution on plastic waste. Among APEC regional network, several efforts to promote innovative models in reducing and managing land-based debris into oceans have been conducts throughout the last 5 years. At domestic level, World Bank have implemented a number of analytics on metrics, diagnostics, technical and market studies and policy supports on domestic plastics action plans, circular economy roadmap and EPR in Malaysia, Myanmar, Pacific Island economies, The Philippines, Thailand and Viet Nam. In some economies as Cambodia, China, Indonesia, Lao PDR, World Bank have invested in projects related to sustainable waste management, tourism, flood risk management, etc.

Ms Anjali Acharya also summarizedAssociation of Southeast Asia Nations (ASEAN)' regional action plan to combat marine plastic debris with four components: Policy support and planning; Research Innovation and Capacity Building; Public Awareness, education and outreach; Private sector engagement. In the view of waste value chain, several actions have been categorized including: Reducing inputs into the system; Enhancing collection and minimizing leakage; Creating value for waste reuse.

In term of regional studies, regional plastic leakage methodologies for ASEAN, Analysis of Riverine Technologies to capture plastic waste across ASEAN member states, Regional Waste Trade across ASEAN are those researched conducting in recent years. In the next five year (2022 - 2026), The Southeast Asia Regional Program on Combating Marine Plastics (SEA-MaP) will be implemented with the amount of budget around $20 million, strengthening the plastics policies and regulatory frameworks and promoting innovative solutions to help reduce plastic pollution in Southeast Asia.

Dr Olga Pantos, Senior Scientist, New Zealand's Institute of Environmental Science and Research presented the current management of seafloor marine litter.

The original modelling suggested that by 2050 there would be more plastics than fish in the ocean. This has recently been assessed and it is now estimated that these original numbers were an underestimation of about 50%. It is now thought that 19-23 megatons of plastic entered the ocean in 2016, which equates to approximately 11% of the plastic produced that year.It must be noted that these estimates concentrate on larger plastics. It is not clear what the levels of smaller macro and microplastics are and even less is known of the levels of nano-plastics.

Over time the levels of the small stuff will increase relative to the large stuff as it breaks down.

One of the properties that makes plastic so popular and used for so many things is its durability, it cannot be digested by organisms and used as a food source by them. This means that plastic never degrades, instead it fragments into ever smaller pieces until it cannot be seen with the naked eye. Only 0.5% of the plastic in the ocean actually floats on the surface of the water.

Food includes fresh and processed types. Fresh foods are not only limited to seafood as has long been considered the case. Plants are now also being found to take up small plastic particles. Inhaled plastic particles may remain in the lungs, and particles smaller than 30 µm can be internalised by immune cells in the lungs. Particles in the lungs may also be translocated to the stomach via mucus lining of respiratory tract.

There is also evidence of translocation of particles across gut membranes and around the body, with deposition in other organs. This is inline with the recent results showing that plastic particles are moving around our bodies via our blood. Early evidence points to effects ranging from inflammation of gut the lining, damage of lung cells as well as other things.

The impactsof plastic are dependent on their associated chemicals, the base polymer, their size, the microbes that become associated with them, the age and the organism that plastic interacting with.

SESSION 2

The Second Session on "Rethinking plastic – The circular economy solution to marine litter" was chaired by MrFelipe Victoria, Senior Manager for International Plastics Policy at Ocean Conservancy.

Mr Hoang Thanh Vinh, Program Analyst, Climate Change and Environment Unit, United Nations Development Program Viet Nam presented chances to reduce marine litter by innovations and partnerships for circular economy.

Innovation is a key to reduce plastic pollution. Innovations to tackle plastic pollution and reduce marine plastic litter could be new technologies to develop alternative products to single use plastic; new public campaign for reducing the use of plastic in daily life; new management scheme to collect discarded plastic and packaging (EPR, deposit-return, MRF), new technologies to recycle plastic waste, new technologies to reduce plastic waste, new methods to collect/remediate plastic pollution (interceptor, plastic offsetting).

He also shared socialized model of waste management as small scale models of domestic waste management**.** Farmer union and women union are two firm joining in this model. This community-based also established sub-union of women waste workers, made them more formal in the waste management system.

Mr Hoang Thanh Vinh also shared information about National Plastic Action Partnership (NPAP), locally lead multistakeholder platform that enable collaboration between economies's governments and other vital partners to turn plastic waste and pollution commitments into action. Three strategic pillars lay out the main actions include: convene communities and curate conversations; generate new insights and

action roadmaps and catalyze strategic financing.

Lastly, he concluded the presentation with the remark of Viet Nam's strong community power. He highlighted to mobilize this strength of community, solidarity that leading to behavior changes in reducing plastic pollution.

Ms Kwan Pei Ying, Researcher at the Plastic Industry Development Center (PIDC) presented how to implement a circular economy model for the entire plastic supply chain.

Firstly, Ms Kwan talked about crisis and opportunities of the plastic industry related to policy (regulatory restrictions, trade barrier, etc.), public opinion (industry image, traceability mechanism, green consumption, etc.), costs (process, marketing, certification, etc.) and competitions (peer and other industries).

She consented that tackling the problem of marine litter through a circular economy approach presents clear benefits for the marine environment, but also helps address resource scarcity and climate change. It also has the potential to create jobs and to foster innovation and market creation[1].

Secondly, Ms Kwan shared two case studies on a recycle ocean waste – fishing nets and recycle ocean waste – Styrofoam floats. From these recycle ocean waste, Chinese Taipei enterprise can make sport goggles, drawstring backpack, keyboard and mouse. On the other hand, she also shared several cases as enterprise actions that have been wildly conducted in Chinese Taipei such as detergent container made with 100% recycle materials, the company with close circulation of 100% recycle plastic container and wares, and renting recycled plastic display shelf, recycling the food container for remaking flower pots, etc.

Finally, she highlighted the inclusive approach as sustainable material library which engages multi-stakeholders to join in think and action tank, including: NGOs, Cluster, Business, Academic, Media and global solutions.

Mr Eirik Lindebjerg, Global Plastic Policy Lead, World Wide Fund (WWF) talked about a global treaty to end plastic pollution as a global chance for circular economy transformation.

Mr Eirik summarized briefly about current policy responses. 60% of the economies which have some form of plastic - related legislation, regulations only address single-use plastic bags. Only one of the top 20 plastic leakage economies has put in place plastic legislation covering more than 50% marine plastic waste items. Current legislation does not sufficiently tackle other plastic products and waste types, nor effectively facilitate the implementation of circular economy approaches and measures. The current legislative landscape is also unpredictable, making it complex and challenging for business to plan effective responses. It is the fact that regulations in one domestic jurisdiction or fragmented and heterogenous regulations between economies would not aid effectively the circular economy transition. That must be harmonized rules, standards and definitions on a global scale.

In 2 March 2022, The Resolution titled "End plastic pollution: Towards an

[1]Srinivas, Hari, "Moving towards a Circular Economy: More than Just 3Rs!". GDRC Research Output - Concept Note Series E-097. Kobe, Japan: Global Development Research Center. Retrieved from https://www.gdrc.org/uem/waste/more-3r.html on Tuesday, 3May 2022

international legally binding instrument" was adopted at the resumed fifth session of the United Nations Environment Assembly. A new treaty on plastic pollution provides different agreements including: a harmonized set of definitions and standards; common policy framework; global reporting metrics and methodologies and an international capacity building mechanism. On the other hand, the new treaty composed the potential priority measures from reduce ("close the tap")then innovate, redesign, reuse and recycle ("close the loop") and lastly manage plastic waste leaked into the environment ("No plastic in nature"). A UN treaty could be not only help businesses overcome the current barriers by provided agreements but also benefit businesses throughout reduced operational complexity and compliance risk across market, stabilized policy framework to plan investments and cut compliance scanning, simplified reporting value chain and enhanced management capacity and scale to meet corporate commitments.

Mr Henrique Pacini, Economic Affairs Officer, UNCTAD presented how the value embodied in plastics is regained.

Trade in plastics account for over $ 1 trillion per year and 344 MM tons. Trade accounts for a major share of all plastic produced as an important policy level. Currently, 70% of all plastic produced ends up as waste. This constitutes a recognized problem by UNEA 5.2 resolution.

Single use plastics is the most value waste. Single use plastics material substitutes that rely on domestic feedstocks can generate exports, economic activity, jobs and foreign exchange benefits for developing economies. Imported feedstock can also be an input for manufacturing end-use products. Such material shift can improve oceans and ecosystems health.

He finally concluded with recommendations for: accelerating the adoption of the treaty on ending plastic pollution; Accelerating collaboration, sharing of information, knowledge and best practices to eliminate plastic pollution; Promoting further research, development, and adoption of material substitutes to single-use plastics to address plastic pollution in the ocean; Promoting further development of the Harmonized System (HS), in special classifications relevant to material substitutes; Promoting incentives to eliminate plastics, including by addressing the tariff rates applied to plastic and substitute materials to facilitate trade of substitute materials which are less polluting to the ocean.

SESSION 3

The Third Session on "Circular economy practices for addressing the marine plastic litter challenge" was chaired by Ms Le Thi Thanh Thao, United Nations Industrial Development Organization (UNIDO) Representative in Viet Nam.

Dr Nguyen Phuong Nam, Founder of KLINOVA Climate Innovation Consulting & Services JSC shared the regulations on circular economy from legal to practices for plastic cycle in Viet Nam.

Firstly, Dr Nguyen Phuong Nam shared an regional action plan on combating ocean plastic waste in the period of 2021 – 2025 in the ASEAN community. This plan was reaffirmed in May 2021.

Secondly, he presented the development of existing Viet Nam policies. Thenewest legislation is the Viet Nam Environment Protection Law 2020. Related to circular economy, article 142 oriented toward the application of redesign, recycling and resource circulation. Article 75 forces waste segregation at source and is implemented no later than 31 December 2024.In the same time, service charges for collection, transportation and treatment of domestic solid waste based on the sorted amount of waste, instead of the current fixed charge per household or per capita according to article 79. The Law also mentioned Extended Producer Responsibility including recycling responsibility and waste treatment responsibility, green bonds and green credits.

To implement the Law, Decree 08/2022 have been developed to promote circular economy with priority on plastic. National Action Plan for circular economy before 2025, which specifies the criteria and targets for sectors. Ministries, ministerial-level agencies and provincial People's Committees are responsible for integrating specific criteria and targets for the implementation of CE into provincial strategies, programs and plans. Producers are obliged to comply with EPR and environmental standards. Circular economy models can be eligible for incentives, green credits and green bonds. Besides, research and technology transfer between business for circular economy is promoted as a key point. Promoting markets for secondary materials and green public procedure are also mentioned in the Decree.

Thirdly, he reviewed other policies related to plastics since 2018 in Viet Nam such as Amended National Strategy on Integrated Management of Solid Waste to 2025 and vision to 2050 (2018), National Action Plan for Management of Marine Plastic Litter by 2030 (2019), Directive 33/CT-TTg to strengthen the management, reuse, recycling, treatment and minimisation of plastic waste (2020), Decision No. 1316/QĐ-TTg on the approval of the scheme for strengthening management of plastic wastes in Viet Nam (2021) and Circular No. 02/TT-BTNMT detailing the implementation of a number of articles of the Environment Protection Law 2020 (Early 2022)

Lastly, he proposed some recommendations for Government, NGOs and development partners and private sectors.

Mr Hery Gunawan DAULAY, Deputi Director of Coastal Restoration, Directorate of Coastal and Small Islands Utilization, Ministry of Marine Affairs and Fisheries, Indonesia talked about his economy‘s case study on the marine plastic circular economy development, especially in coastal and marine.

Mr Hery shared several marine debris programs in Indonesia during 2017-2021.

He lastly concluded the presentation with some significant points: Recycling is one strategy for end-of-life waste management of plastic products. Recycling captures value from used items, and can also result in savings for producers. Recycling also offers the potential to create jobs. Direct investments in small/localized waste collection infrastructure can help reduce litter in coastal areas thus reducing the risk of items reaching the ocean.

Ms Vararin VONGPANIC, Fishery Biologist, Department of Marine and Coastal Resources, Phuket Marine Biological Center presented Circular Economy practices for addressing the Marine Plastic Litter Challenges in Thailand.

Based on the well-known study of researchers from Univ. of Gorgia, USA, Thailand was ranged the 6th in the world on marine plastic litters leakage into the ocean. To solve urgent and critical issues and create pollution and waste management model in pilot areas, Thailand have established recent legal and institution framework including National strategy on Natural Resource and Environment in the period 2017 – 2036; Plastic Waste Management Roadmap in the period 2018 -2030 and lastly Plastic waste management Action Plan, phase I in 2020-2022.

Firstly, she went into details in the Thailand waste management Roadmap which have vision of moving towards sustainable plastic management by circular economy. Since 2019, Thailand adopted “Abankok 3R Declaration towards Prevention of Plastic Waste Pollution through 3R and Circular economy” and “Bangkok 3R Declaration on Combating Marine Debris in ASEAN Region”. By actions, Thailand have been banning usage of cap seal, Oxo and Microbead since 2019. Staring phase II in 2022, Thailand is implementing banning for usage of plastic bag (smaller than 36 micro), foam food container, plastic cup (smaller than 100 micron) and plastic straw. On the other hand, the government focuses on developing recycling plastic waste system through circular economy. From 2023, other single – use plastics also will be limited and stopped usage. Phase III will be started from 2027, with 100% of target plastic wastes will be recycled by applying circular economy principle. Since 2018, cleanup campaign for removing the abandoned marine litter form coastal ecosystem have been conducted in the coastal provinces. Several plastic waste reduction measures have been implemented in all 549 coastal municipalities with selected target groups. Researched on situation and impacts of plastic debris in marine environment evidence to support proper management intervention are undertaken.

Secondly, Ms Vararin shared significant challenges In effective waste management in Thailand such as: inconsistent waste database and report from various agencies, ineffectively engaging informal waste pickers into public waste collection systems, overlapping and conflicting policies among multiple government sectors, less knowledge on separation of recyclable plastic products, insufficient on financial resources to implement waste management for local Governments.

Finally, she highlighted some importance of interventions as recommendation: Ban or Limitation on single use plastics/plastic bags; Educate and raising awareness for household sorting; Introduce legitimate on waste sorting for citizen responsible; strengthen collaboration among government, business and people on reducing marine litters, particularly plastic litters.

Dr Nguyen Le Tuan, Director of the Viet Nam Institute of Seas andIslands shared Viet Nam’s circular economy practices for addressing the marine plastic litter challenge.

Mr Nguyen Le Tuan have shared significant points related to challenges for circular economy in Viet Nam. Circular economy is associated with technological innovation and model design while Viet Nam is a developing economy with outdated technology and small-scale production.

Viet Nam has not had a legal corridor for developing circular economy. This issue needs to be resolved; otherwise the implementation of circular economy is spontaneous and subject to market dynamics. Viet Nam has not developed a set of

criteria to identify, evaluate, summarize and give an accurate classification of Circular economy development. Circular economy is the culmination of zero-emission approach which requires a truly coordinated sharing of economic benefits. Hence, the challenge to use economic incentives and market mechanisms to engage stakeholders in implementing Circular economy is an enormous.Implementation of CE requires good experts who are capable of handling stages from designing to the final stage of reuse and recycling of waste. Currently, there is no trained experts in this field and no training majors for these experts.

The Circular economy requires classification and cleaning of waste before being reused and recycled, which is a great challenge to the practice of Viet Nam's economy and the awareness of household sorting of waste at source.It is a significant challenge to foster full awareness of the Circular economy from design to implementation in all sectors and fields among businesses, citizens and managerial levels, and leaders to reach a common consensus.

He finally proposed significant recommendations for promoting circular economy in Viet Nam such as: Building up a draft “National Action Plan on Circular Economy”; focusing on Redesign and Reuse “plastic products”, Reduce “single-use plastics”. Developing Circular economy criteria and guidelines for specific sectors and evaluate Circular economy performance at different levels (domestic and local levels, industrial zones, concentrated residential areas, business levels); Continue to formulate and carry out programs to popularize the impacts of single-use plastics and non-biodegradable plastic bags; Encourage organizations and individuals to vigorously reuse plastic litters and promote CE and green growth; Continue to implement Action Plan “Viet Nam National Plastic Action Partnership” and “National Action Plan on Marine Plastic Debris Management by 2030”.

SESSION 4

The fourth Session on “Aotearoa plan of action implementing the Putrajaya vision 2040: New partnership towards a zero plastic emission Asia - Pacific” was chaired by Dr. Nguyen Le Tuan, Director of the Viet Nam Institute of Seas and Islands.

Ms Nilgün Tas, Deputy Director, Department of Environment, United Nations Industrial Development Organization (UNIDO) shared about potential policy trajectories to achieve the long-term vision targets.

Ms Nilgün Tas started by highlighting some critical views related to global development now and in the future. Increasing interest in circularity as a high potential solution to address interlinked global challenges on climate change, biodiversity loss and air pollution. The need to incorporate circularity along product value chains and throughout product life-cycles, product policies will increasingly include. For example: reusability, repairability, re-manufacturability, recyclability through “product design”, etc. This is expected to drive innovations, new technologies, new jobs, voluntary actions and partnerships.Integration of digital tools in supply chain management for greater transperancy and other business proceses such as reverse logistic, product passports, electronic tags, product – as – service, etc.

She also proposed policy proposals towards a zeroplastic emission in Asia-Pacific. Eliminating problematic and unnecessary plastic packaging and products will be increasing, to aim for 100% recycle, compostable or reusable products and packaging by design. Green design must fit existing technologies, for example: labels on bottles, change on color to ease sorting prior to recycling. Optimizing materials and characteristic of plastic products minimizes negative environmental impacts. For example: minimize weight and size of products could limit the time of decomposition time. Whenever possible, incorporate digital tags to ease high quality sorting, set up deposit-return and EPR schemes, encourage households to sort. Phase out fossil fuel subsidies (an APEC goal) progressively incentivize replacing fossil fuels with renewable energy along product value chains.

Ms Chihiro Baba, Section Chief, Office of Policies against Marine Plastics Pollution, Ministry of the Environment, JAPAN presented about monitoring and data sharing hub of marine plastic litter.

She firstly shared the view of the importance of monitoring for marine plastic litter with various benefits such as: understanding the current status of the form of pollution, estimating its negative impacts on biota, identifying its sources and hotspots,etc. Harmonization of the monitoring methods is important for producing and sharing comparable data for their scientific evaluations. Each economy and organization should share the outcomes of the initiative for harmonization of monitoring methods. More science communities and policy-makers are expected to build a network, beyond regional boundaries. Each economy and organization ís expected to cooperate with each other for the promotion of data sharing. International organizations are expected to take initiatives for the data sharing. Ministry of the Environment, Japan has been working on harmonization of monitoring methods and data sharing for ocean surface microplastics since 2016 in line with the discussions at the G7 Schloss Elmau Summit in 2015, the G20 Osaka Summit in 2019, and related international workshops.

Marine plastic litter monitoring data sharing project started from 2020 supports to open the information to the public such as: researchers, policy-makers, general public. The database will be launched in JFY 2023 and can be used in any economy. The projetc aims to develop a global network hub to share and compile monitoring data of ocean surface microplastic in collaboration with existing and future additional initiatives.

CONCLUSION

Elimination of land-based marine litter require a comprehensive and aspirational action plan that enhances circular economy practices from shifting of mindset to altering behaviors of consumers, producers, policy makers. Technical and economic feasibility of reducing leakage of plastic materials into the environment, especially oceans along life span of plastic products are already emerging in the G20 economies and others. A range of policy measures that encourage circular economy practices by both public and private actors are also illustrated[2].

[2]UNIDO (2019) A working paper - Addressing the challenge of marine plastic litter using circular economy methods

Emerging strategies are on the way to a circular economy addressing global marine plastic litter challenges including: designing out waste to retain plastic within the economy; regaining the value embodied in plastics leaking out of the economy as waste.

It is the crucial point highly agreed in the workshop that emphasized the increasingly important role of circular economy and sustainable material management practices. Therefore, economy-wide strategies need to different stakeholders who directly research and implement circular economy practices to minimize the leakage of land-based debris into the ocean.

PROMOTING CIRCULAR ECONOMY AND SUSTAINABLE MATERIALS MANAGEMENT TO EFFECTIVELY ADDRESS MARINE PLASTIC LITTER IN THE ASIA – PACIFIC REGION

COMPENDIUM OF RECOMMENDATIONS

I. Providing an evidence-based progress actions towards the circular economy transition.

1. Supporting economies in their measurement of the circular economy by developing circularity assessment model which provide meaningful data for decision makers to increase circular material management and reduce leakage of waste into the environment.
2. Developing a global network hub to share and compiling monitoring data of ocean surface microplastic in collaboration with existing and future additional initiatives.
3. Building waste management performance indicators and methodology to track progress against economy-wide and municipal waste targets, maintaining an economy-wide waste database: identification of hotpots, waste profile studies to identify trends and target items, number of certified collectors, sorters, recyclers, etc.[3]
4. Increasing funding and improving outcomes by financing all phases of integrated waste management systems, enabling innovative, transparent funding approaches such as investing green taxes and clean tax cuts, extended consumer responsibility schemes as appropriate[4].
5. Developing domestic guidelines on circular economy criteria and indicators for official monitoring of circular economy progress.

II. Enhancing innovations in effective material management and supply chain transformation models

1. Creating incentives for more engagement of the private sector in campaigns on circular economy, product life-cycle management projects, sustainable consumption and production and “3R” approaches.
2. Promoting private sector's investment in redesigning products/packaging and alternative materials.
3. Promoting further research, development, and adoption of material substitutes to single-use plastics to address plastic pollution in the ocean.
4. Enhancing new technologies to develop alternative products to single use plastic; new management scheme to collect discarded plastic and packaging (EPR, deposit-return, MRF), new technologies to recycle plastic waste, new

[3]Report update of 2009 APEC report on economic costs of marine debris to APEC economies, p.79 (APEC Secretariat - Project OFWG 01 2018A, 2020)
[4]Report update of 2009 APEC report on economic costs of marine debris to APEC economies, p.80 (APEC Secretariat - Project OFWG 01 2018A, 2020)

technologies to reduce plastic waste, new methods to collect/remediate plastic pollution (interceptor, plastic offsetting).

5. Promoting circular supply models replace traditional material inputs derived from virgin resources with bio-based, renewable and recovered materials, which reduces demand for virgin resource extraction in the long run[5].
6. Enhancing resource recovery models recycle and reprocess waste into secondary raw materials, diverting waste from final disposal while also displacing the extraction and processing of virgin natural resources[5].
7. Promoting life extension models, through reuse, repair or remanufacturing extend the use period of existing products, slow the flow of constituent materials through the economy, and reduce the rate of resource extraction and waste generation[5].
8. Enhancing product service system models, where service rather than products are marketed, improve incentives for green product design and more efficient product use, promoting a more sparing use of natural resource[6].
9. Integration of digital tools in supply chain management for greater transperancy and other business proceses such as reverse logistic, product passports, electronic tags, product – as – service, etc.

III. Strengthenning extensive collaboration and cooperate with value chain partners to develop stable demand for waste-derived, recovered or recycled alternative materials at early milestone in the long path towards a circular economy

1. Reducing import and export of plastic waste.
2. Promoting material management and products design based on the vision of the whole lifespan of plastic materials (designed for recyclability/recoverability, without hazardous additives, with minimum material intensity) and production processes (based on principles of RECP), distribution, use, recycling and disposal[7].
3. Increasing plastic segregation at household level.
4. Promoting incentives to eliminate plastics, including by addressing the tariff rates applied to plastic and substitute materials to facilitate trade of substitute materials which are less polluting to the oceans.
5. Promoting circular city model which promotes a city-regional economy of micro logistic and industrial manufacturing for waste materials and centrality of household in producing and consuming waste in the urban environment.

IV. Supporting the formulation of policies, regulations, guidelines that will

[5] OECD (2021) Towards a more resource – efficient and circular economy
[6] OECD (2019) Business model for the Circular economy: Opportunities and Challenges for policy, OECD Publishing, Paris https://doi.org/10.1787/g2g9dd62-en
[7] UNIDO (2019) Working Paper - Addressing the challenge of Marine plastic litter using circular economy methods

create the legal basis for the transition to a Circular Economy

1. Developing domestic strategy, road map and action plan to eliminate problematic and unnecessary plastic packaging and products, incentivize reuse, aim for 100% recyclable, compostable or reusable products and packaging by design.
2. Accelerating the adoption of the UN Resolution on ending plastic pollution: Towards an international legally binding instrument that supports businesses overcome the current barriers and benefit businesses though out reduced operational complexity and compliance risk across market, stabilized policy framework to plan investments and cut compliance scanning, simplified reporting value chain and enhanced management capacity and scale to meet corporate commitments.
3. Setting ambitious waste management targets at the economy-wide and at municipal levels. Setting up target for EPR schemes for particular issues such as packaging, collection target for pre-paid garbage bags, market restrictions on unnecessary and avoidable items at risk of becoming marine litters such as single-use/disposable straws, food containers, cutlery, etc.[8]

V. Building networks and partnerships to enhance learning, exchange and update of data, best practices and the latest solutions and strategies applied in APEC in promoting circular economy and sustainable material management.

1. Circulating a number of reliable analytics on metrics, diagnostics, technical and market studies and policy supports on domestic plastics action plans, circular economy roadmap and EPR among economies in APEC region.
2. Piloting and expanding user-pay waste collection services.

VI. Increasing public awareness of circular economy and promoting behavior change in daily consumption

1. Promoting sustainable lifestyles and diets of urban population through ongoing public education initiatives to reduce the use of plastic in daily life and circularity of daily products.
2. Promoting the use of digital technologies to facilitate efficient use of transport assets and sustainable consumption. Digital technologies are enablers for the sharing economy and smart cities [6].
3. Fostering the availability of reliable information through public education and communication campaigns linked to circular economy practices.

VII. Strengthening financial transperancy and cooperation between international and regional organizations on the development ofcircular economy practices and sustainable material management

[8]Report update of 2009 APEC report on economic costs of marine debris to APEC economies, p.78 (APEC Secretariat - Project OFWG 01 2018A, 2020)

1. Advocating for moremeaningful commitments from governments, local authorities, governors, and mayors to develop holistic and integrated plastic waste management strategies and actions, including ambitious plastic waste reduction, reuse and recycle targets, the installation of effective institutional and financial systems to transit from linear economy to circular economy.
2. Promoting favorable project-finance investment conditions for the private and public sectorsby ensuring that ocean-plastic and wastemanagement agendas are carefully prioritized across multilateral institutions and regional bodies (e.g. ASEAN, APEC, UN), aid organizations and development banks (e.g. ADB, World Bank, GEF), governments, convening institutions, major corporate players in the chemicals, plastics, and consumer-goods industries [9].
3. Closing the gap in coordinating multi-stakeholder partnerships at the regional level by exploring ways to match waste management service providers and financing institutions or individual investors, following by creating opportunities for the return of investments to make plastic management projects bankable [6].
4. Organizing regular policy dialogues on promoting circular economywith a view to develop a regional action plan ontackingmarine debris litterin the Asia – Pacific region.
5. Further discussions for better engaging private sectors on practicing circular economy principles should be promoted to solving barriers in different contexts in Asia – Pacific economies.

[9] Stemming the Tide: Land-based strategies for a plastic- free ocean (Ocean Conservancy, 2015)