Parallel Event (9th Regional 3R Forum in Asia & the Pacific, 4-6th March 2019, Bangkok, Thailand

Government Consultation on “Draft State of Plastic Waste in Asia and the Pacific – Issues, Challenges and Circular Economy Opportunities”

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Draft Report
"State of Plastics Waste in Asia and the-Pacific - Issues, Challenges and Circular Economic Opportunities"

Contents

Chapter 1: Introduction

Major Drivers(Asia Pacific)

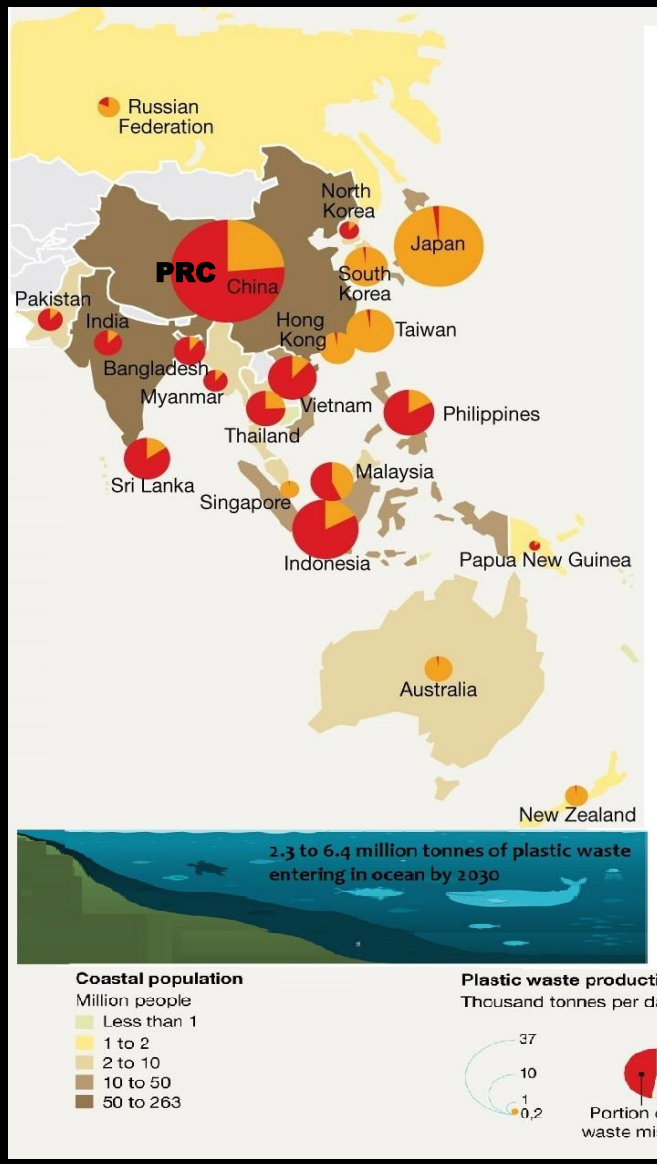
1. Population about 4 billion (2017) to 5.08 billion by 2050 (60% of the world's total population)
2. Urbanization (Urban population from 48% of the region's population in 2017 to 63% of the total by 2050)
3. Economic growth GDP of the major countries in the region was above 25 trillion ranging from US$ 583 to US$ 73,187 per capita.
   - About two thirds of the regional economies, accounting for 80% of the region's GDP, achieved faster economic growth in 2017
   - Developing Asia-Pacific economies grew by an estimated 5.8% in 2017 (projected to grow by 5.5% by 2019)
   - Growing purchasing power and the domestic private consumption are the major economic growth drivers

Key Take Away

Population about (4 billion (2017) to 5.08 billion by 2050 (60% of the world's total population), Urbanization (Urban population from 48% of the region's population in 2017 to 63% of the total by 2050), Economic growth & Growing purchasing power and the domestic private consumption are the major drivers for Plastic Consumption in Asia & the Pacific

Chapter 2: Material Cycle of Plastic

Journey of Plastics: Where ? How Much ? Broad Estimates

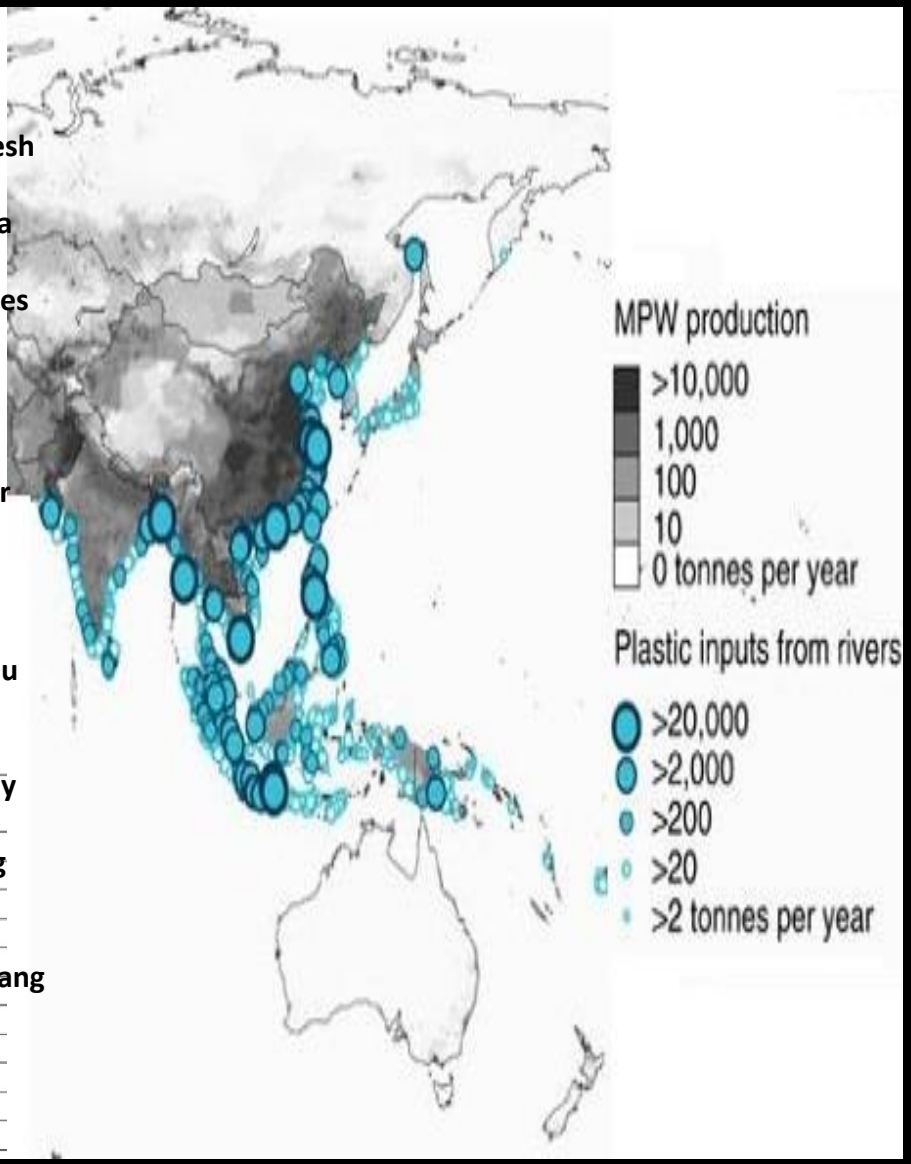


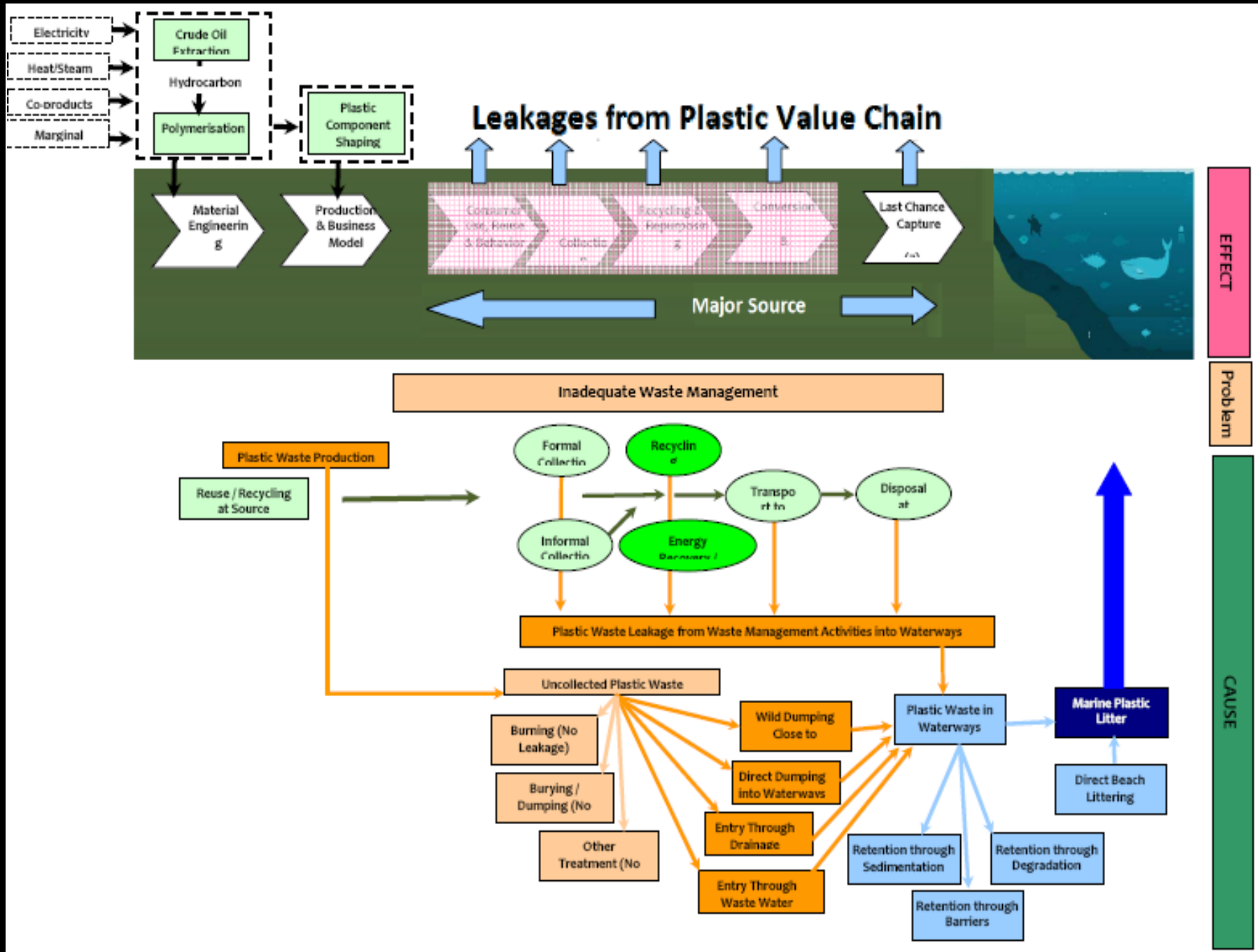
Countries

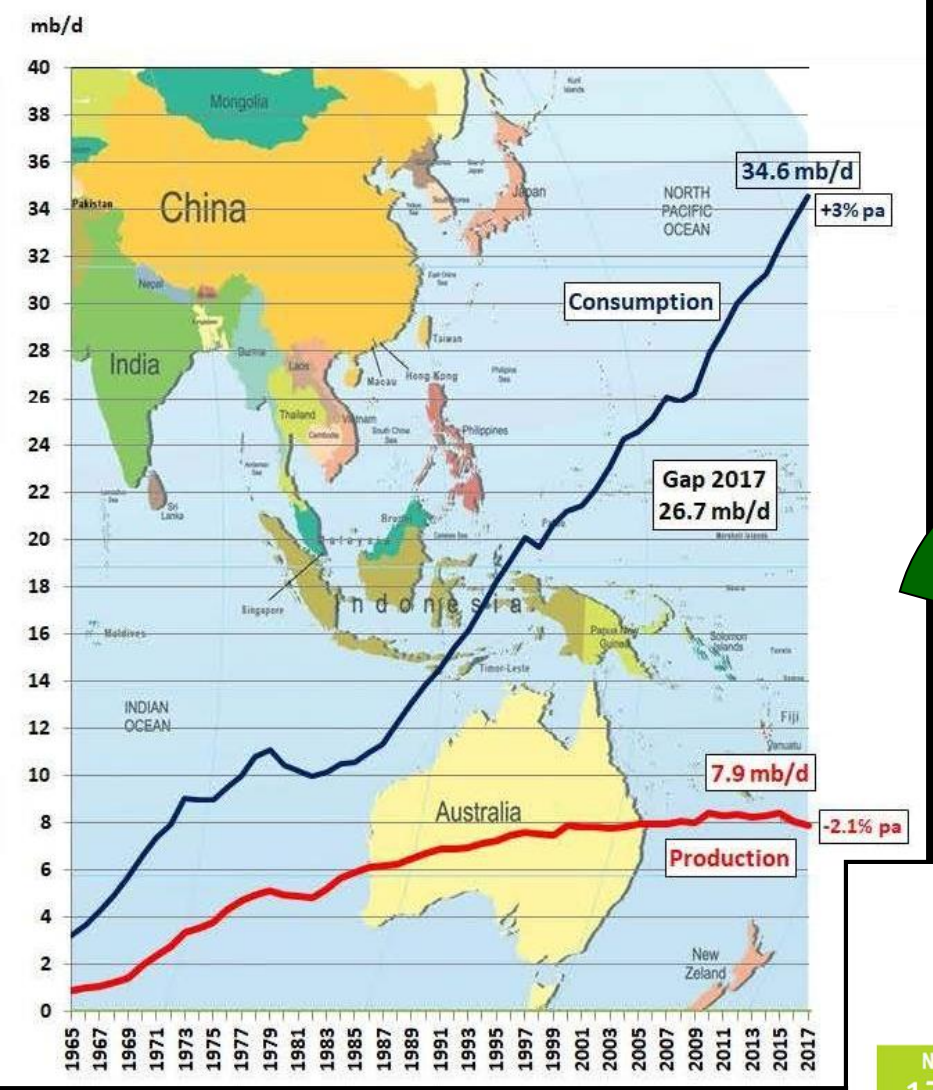
1. PRC
2. India
3. Bangladesh
4. Pakistan
5. Indonesia
6. The Philippines
7. Vietnam
8. Thailand
9. Sri Lanka
10. Malaysia
11. Myanmar

Rivers

1. Yangtze
2. Ganges
3. Huangpu
4. Brantas
5. Pasig
6. Irrawady
7. Solo
8. Mekong
9. Dong
10. Serayu
11. ZuZhujiang
12. Hajiang
13. Progo




Electricity
Heat/Steam
Co-products
Marginal
Crude Oil Extraction
Hydrocarbon
Polymerisation
Plastic Component Shaping
Material Engineering
Production & Business Model
Last Chance Capture
Major Source
Leakages from Plastic Value Chain
EFFECT
Problem
CAUSE
Inadequate Waste Management
Plastic Waste Production
Reuse / Recycling at Source
Formal Collectio
Recyclin g
Transpo rt to
Disposal at
Informal Collectio
Energy
Plastic Waste Leakage from Waste Management Activities into Waterways
Uncollected Plastic Waste
Burning (No Leakage)
Burying / Dumping (No
Other Treatment (No
Wild Dumping Close to
Direct Dumping into Waterways
Entry Through Drainage
Entry Through Waste Water
Plastic Waste in Waterways
Marine Plastic Litter
Direct Beach Littering
Retention through Sedimentation
Retention through Degradation
Retention through Barriers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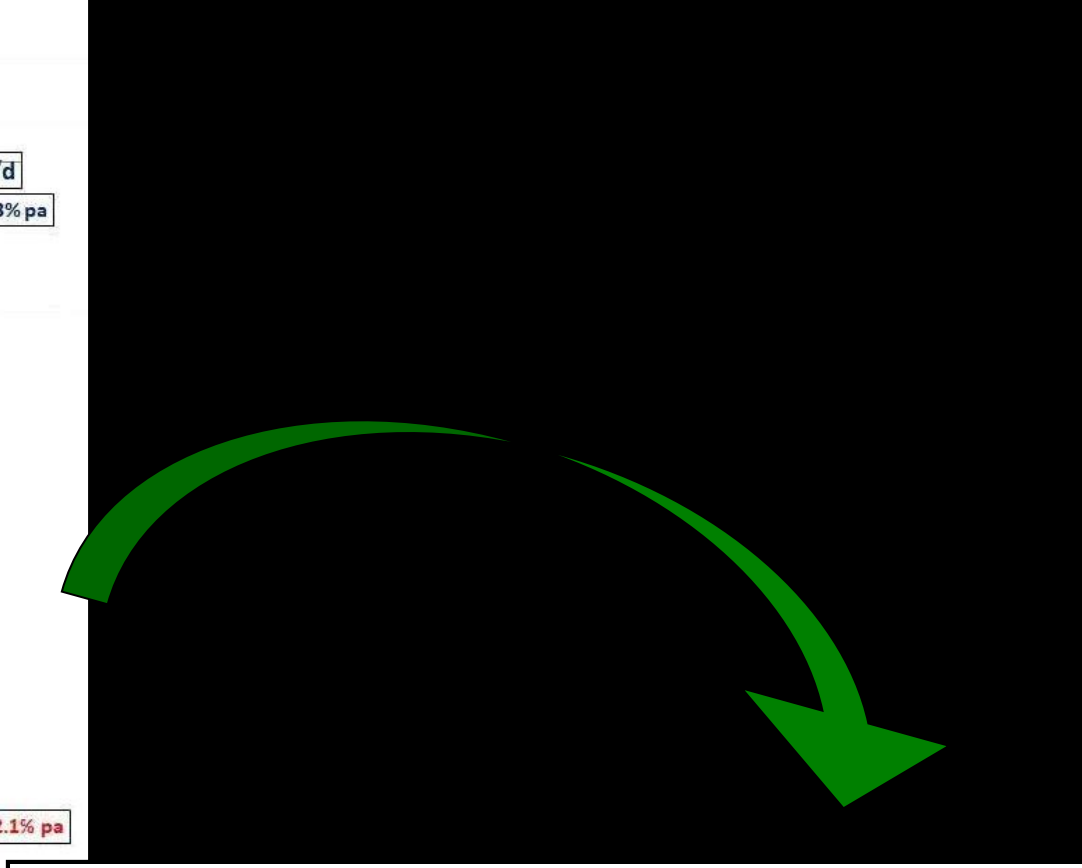
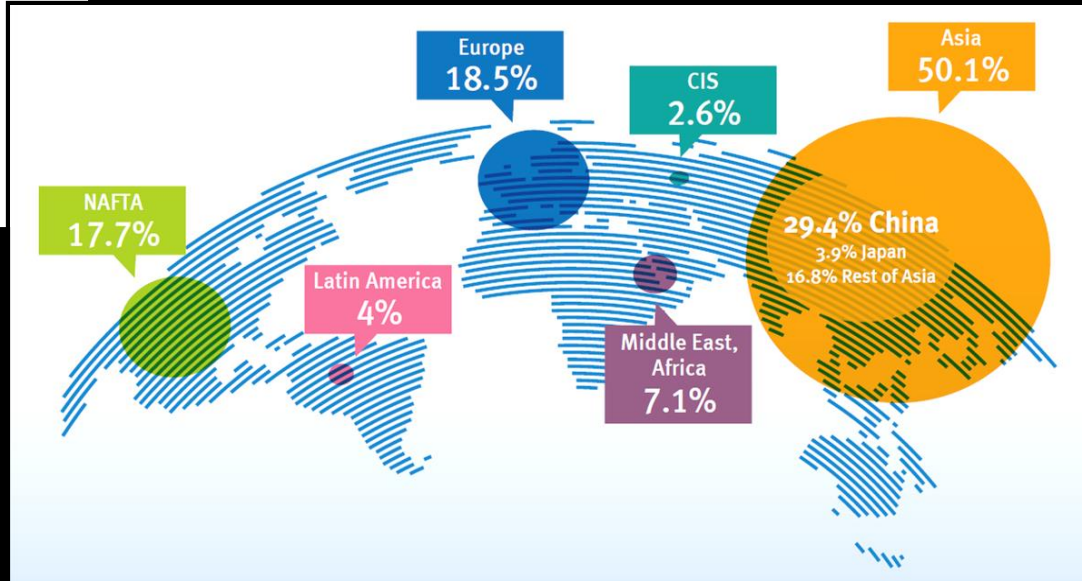
China
India
Mongolia
Pakistan
Nepal
Japan
NORTH PACIFIC OCEAN
Taiwan
Burma
Laos
Thailand
Cambodia
Vietnam
Macau
Hong Kong
Philippines
Sri Lanka
Singapore
Indonesia
Maldives
Timor-Leste
Papua New Guinea
Solomon Islands
Fiji
Vanuatu
INDIAN OCEAN
Australia
New Zeland
34.6 mb/d
+3% pa
Consumption
Gap 2017
26.7 mb/d
7.9 mb/d
-2.1% pa
Production



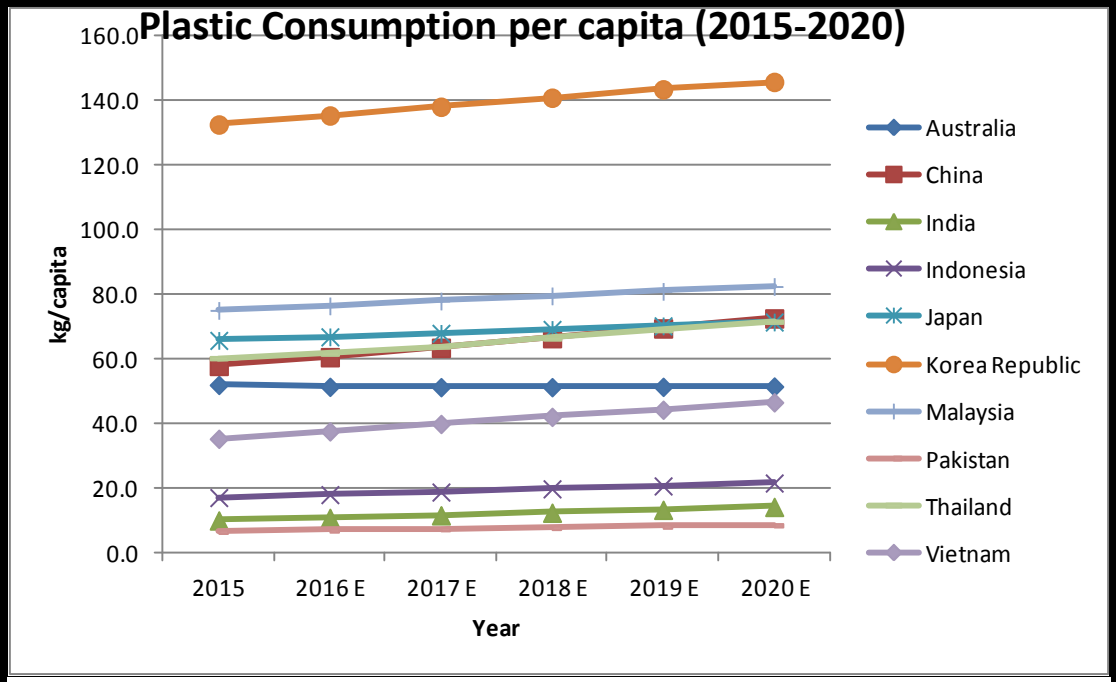

Europe
18.5%
CIS
2.6%
Asia
50.1%
NAFTA
17.7%
Latin America
4%
Middle East,
Africa
7.1%
29.4% China
3.9% Japan
16.8% Rest of Asia

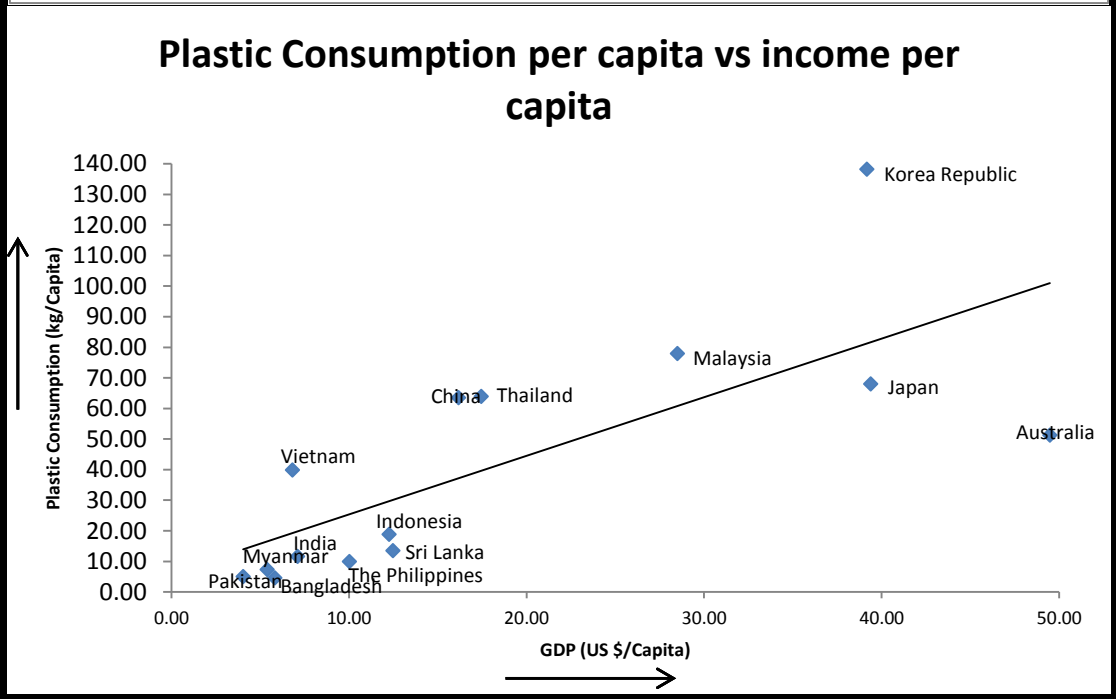
Resource Intensity (Asia Pacific) contd.

1. Material consumption has increased sharply over the past four decades, accounting for more than 50% of world consumption while material productivity has not improved
2. Materials use (biomass, fossil fuels, metal ores and non-metallic minerals) increased from 26.3 billion tonnes in 2005 to 46.4 billion tonnes in 2015, an annual growth rate of 6.1%, which is higher than the economic and population growth rates
3. Domestic material consumption per person increased from 2.9 tonnes in 1970 to 11.9 tonnes in 2015, with a high growth rate at 5.2% per annum, and has now surpassed the global average of 11.2 tonnes.
4. Energy generation continues to rely on fossil fuels
5. The region accounts for more than 50% of the world's water use where water intensity is more than double of the world average.

Trends in Plastic Consumption

1. Plastic consumption ranges from 0.13% to 0.75% of material consumption
2. Importer of fossil fuel, the feedstock for manufacturing plastics
3. Positive correlation exist between GDP growth rate and plastic consumption in the region
4. Increasing trends of plastic consumption (Packaging 40 – 50 %)





Note: Refer China as PRC

Key Take Away

1. Major drivers like population growth, increasing urbanization, strong economy & growing purchasing power is leading to higher resource intensity & plastic consumption which is putting pressure (changes in land use, Emissions & Climate Change) on existing finite natural resource base (material resources, fuel consumption) with major plastic production (50% of the world) happening in China, Japan & rest of Asia.
2. Further, countries in the region with eleven major countries, the major generators of plastics waste with poor recycling rates (< 15 %), lack of waste treatment & disposal infrastructure (open dumping) are putting pressure on climate (open burning – GHG emissions) & marine ecosystem in the region.
3. 3R efforts & circular economy offers potential to address the plastic value chain and pressures in the region.
4. Examples of Singapore, China, Japan & India

Chapter 3: Status of Plastic Waste

Plastic Waste Management (Asia Pacific)

1. (MSW) for Asia and the Pacific was estimated at around 870 million tonnes in 2014 to 1.4 billion tonnes a year by 2030

2. An average generation rate of 1.4 kilograms per person per day, accounting for 43% of the world total (2014) to 1.6 kilograms per person per day (2030)

3. The proportion of plastic, is around 8–12% across all the countries

4. Average plastic waste generation in the region is expected to reach 140 million tonnes by 2030.

5. Majority of plastic waste, which comes mixed with solid waste ranges from 0.02 to 0.04 tonnes per capita per year

6. Strong correlation, which exists between per capita waste generation and the income level of a country

7. The higher the per capita GNI (gross national income), the higher is the per capita MSW generation

Plastic Waste Management (Asia Pacific) Contd.

8. Waste collection rates are moderate (40–80%) in developing countries, 100% in more developed economies (Japan, Australia, Republic of Korea and Singapore)

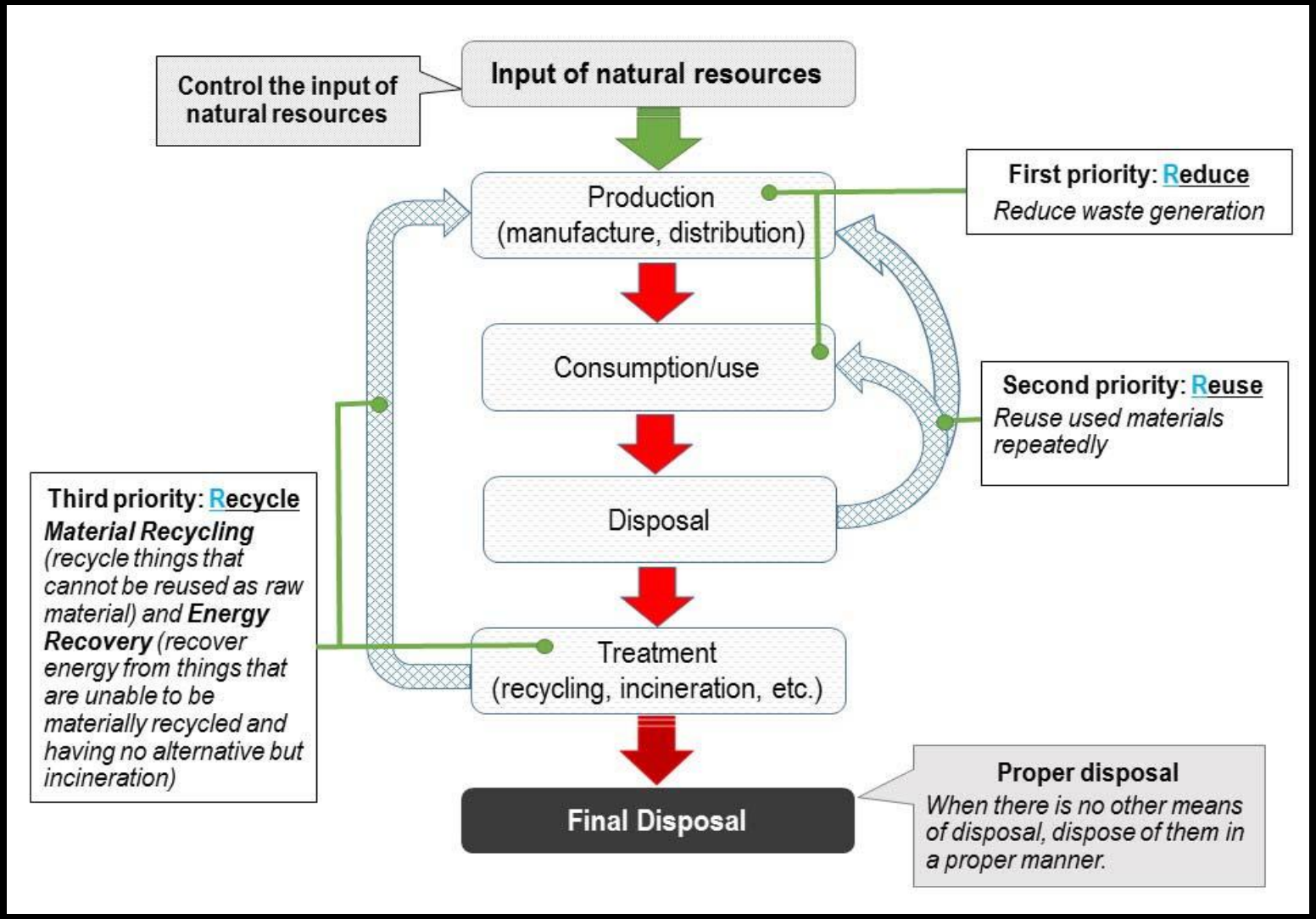
9. Waste separation at source is a common practice in more developed countries while in low- and middle-income countries (informal waste separation)

10. About 55 to 74% of the municipal solid waste is disposed off at disposal sites with zero to 26% being incinerated and 1 to 5% composted

11. Recycling rates in high-income countries have increased progressively over the past 30 years, while in lower-income countries the informal sector often only achieves recycling rates of 20–30% for municipal solid waste

12. Globally, around 14%-18% of waste plastics generation is collected for recycling, 24% is thermally treated (e.g. by incineration, gasification or pyrolysis), remainder is disposed off in controlled, landfill, uncontrolled landfill, or the natural environment. Plastic recycling rate (all types) in the region is low, majority packaging waste (PET, PP, PE)

3 Rs Approach to Achieve Circularity



Ha Noi 3R Declaration which proposed 33 goals and their indicators to monitor the progress of implementation of each goal in Asia and the Pacific region For 2013 - 2023

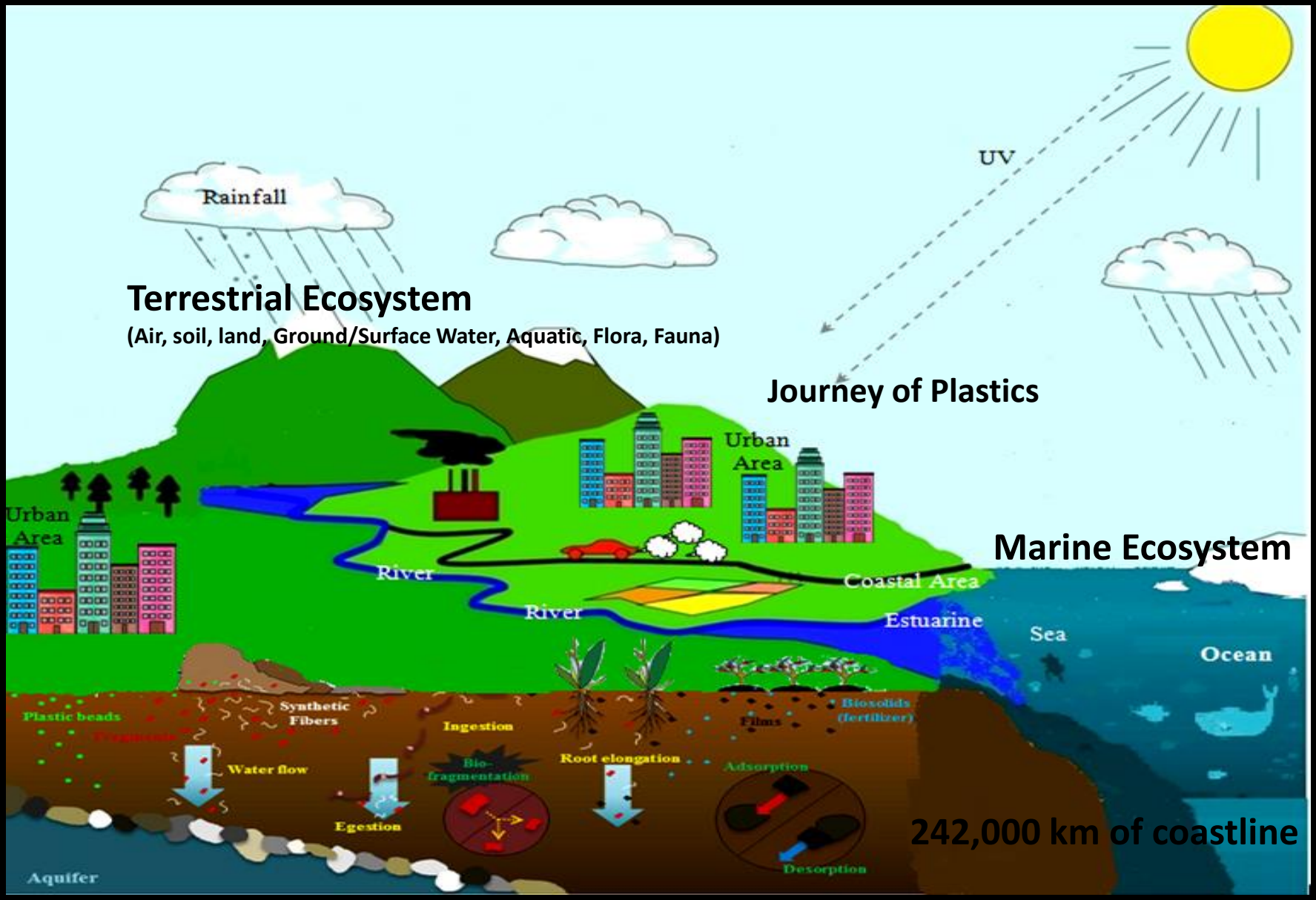
Source: IGES/ MoEJ, Japan

Key Take Away

1. Further, countries in the region with eleven major countries, the major generators of plastics waste with poor recycling rates (< 15 %), lack of waste treatment & disposal infrastructure (open dumping) are putting pressure on climate (open burning – GHG emissions) & marine ecosystem in the region.
2. Progress achieved in implementing 3R efforts (Policy, Regulation, Treatment & Disposal Options) in Asia & the Pacific region is addressing the pollution due to plastic waste in the region.

(Need updates on baseline data on MSW & plastic waste specifically in reference to point number 2)

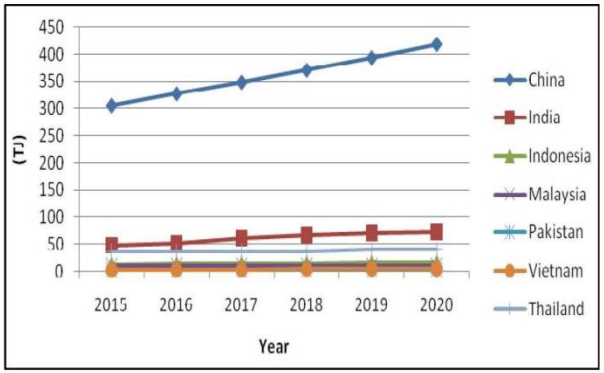
Impacts on Terrestrial Ecosystem



Impacts on Aquatic & Marine Ecosystem

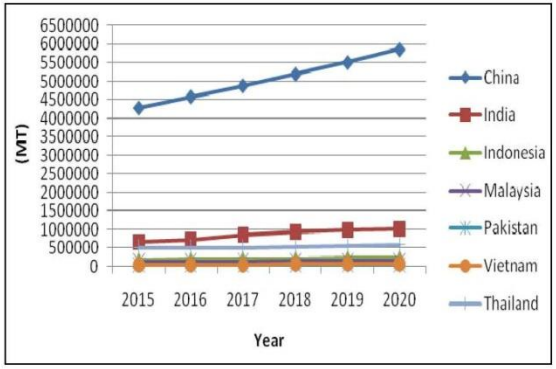
Impacts

1. Impacts on Terrestrial Ecosystem
2. Impacts on Aquatic & Marine Ecosystem
3. Health Impacts
4. Climate Change
5. Socio economic impacts



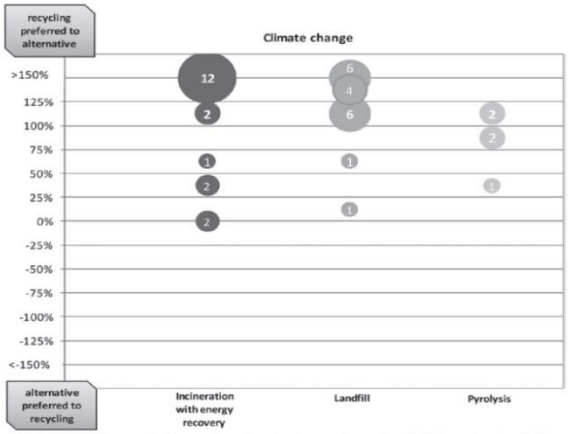
Atmospheric Emission (CO_2) due to Plastic Production in Asia – Pacific (Estimated)

Source: Derived from EUROMAP (2016); Country Cluster Plastics Resin Production and Consumption in 63 Countries Worldwide (2009-2020)



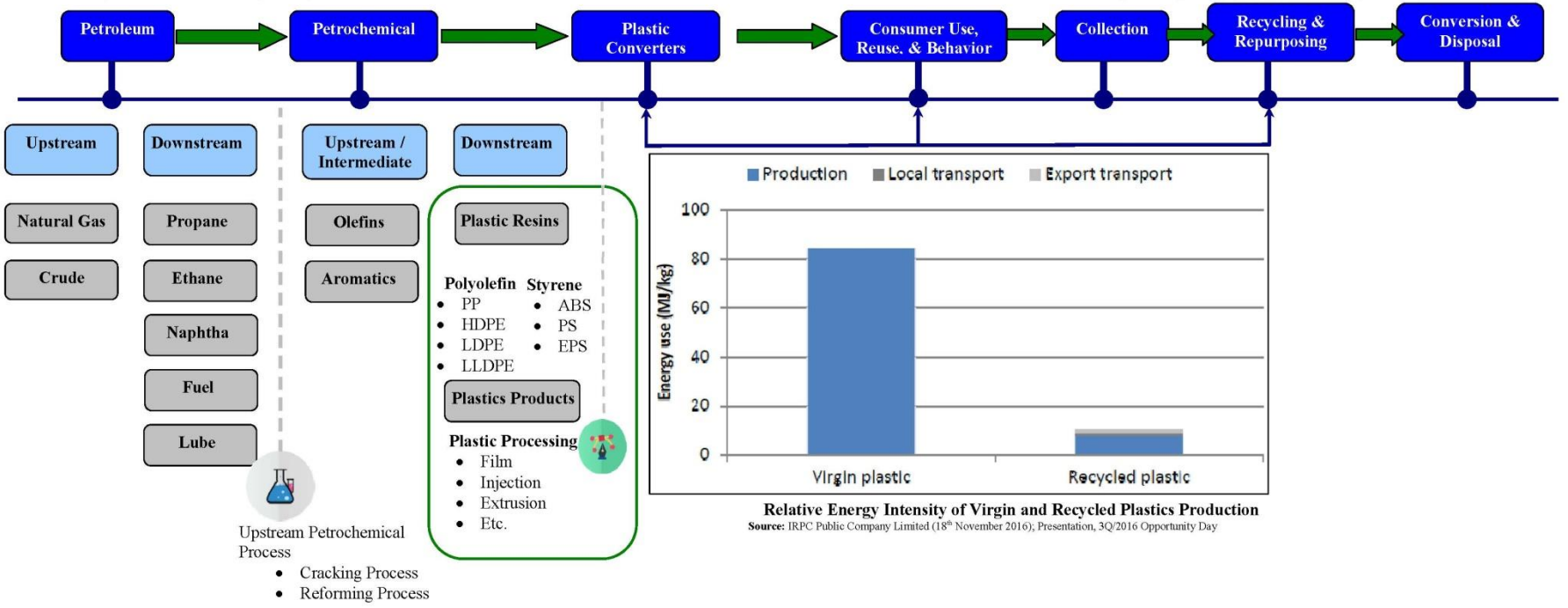
Energy Consumption due to Plastic Production (TJ) in Asia – Pacific (Estimated)

Source: Derived from EUROMAP (2016); Country Cluster Plastics Resin Production and Consumption in 63 Countries Worldwide (2009-2020)



Relative difference between the climate change impacts of different end-of-life options vs. recycling for plastics

Source: Michaud, Farrant and Jan (2010[19]), "Environmental benefits of recycling", *WRAP*, www.wrap.org.uk/sites/files/wrap/Environmental_benefits_of_recycling_2010_update.3b174d59.8816.pdf



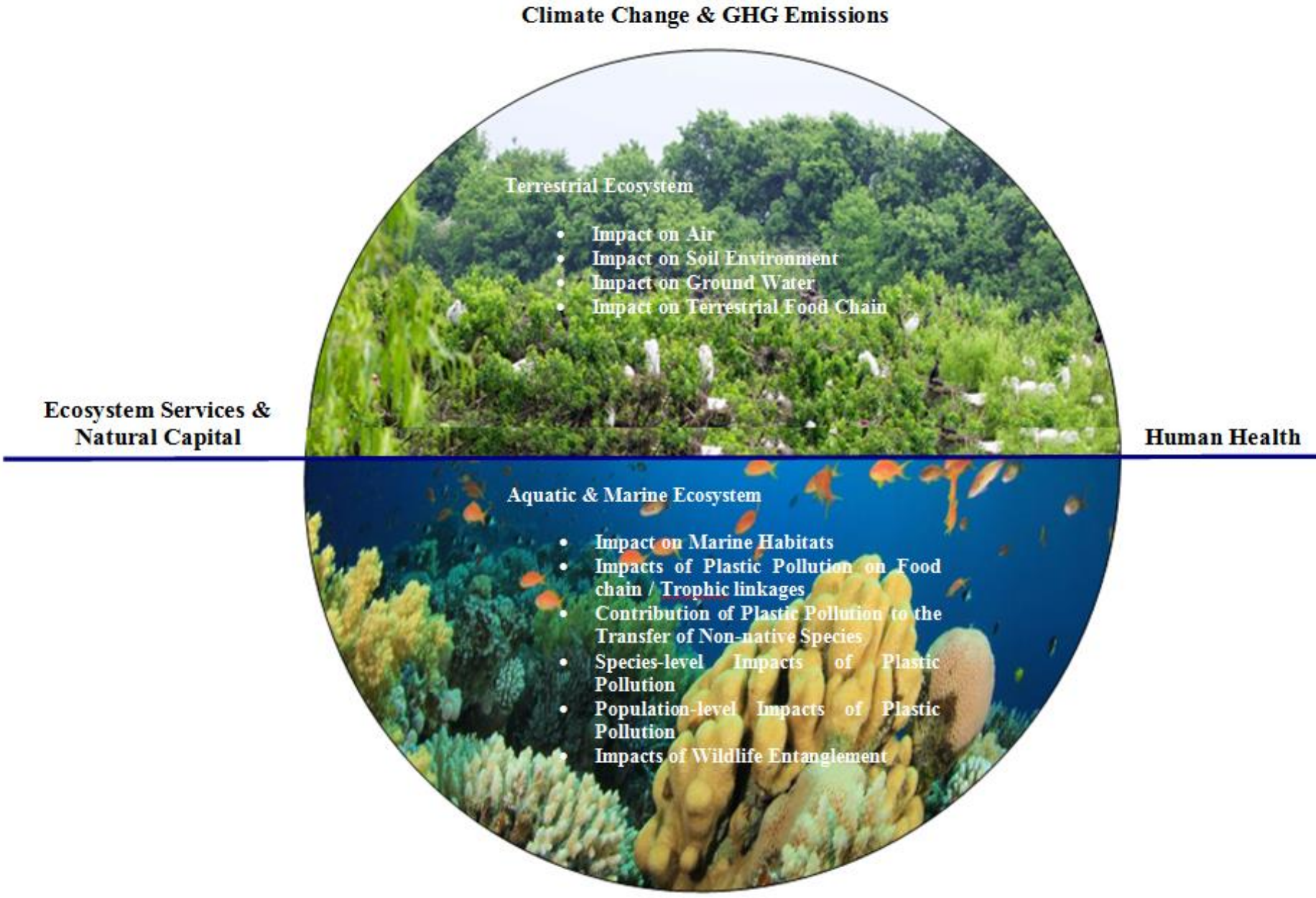
Relative Energy Intensity of Virgin and Recycled Plastics Production

Source: IRPC Public Company Limited (18th November 2016); Presentation, 3Q/2016 Opportunity Day

Estimated GHG Emissions & Energy Consumption during Plastic Production, Relative Energy Intensity of Virgin and Recycled Plastics Production & Climate Change Impacts of Different End-of-Life Options vs Recycling for Plastics

Estimated GHG Emissions & Energy Consumption during Plastic Production, Relative Energy Intensity of Virgin and Recycled Plastics Production & Climate Change Impacts of Different End-of-Life Options vs Recycling for Plastics

Source: EUROMAP (2016); Country Cluster Plastics Resin Production and Consumption in 63 Countries Worldwide (2009-2020) / IRPC Public Company Limited (18th November 2016); Presentation, 3Q/2016 Opportunity Day/ Michaud, Farrant and Jan (2010[19]), "Environmental benefits of recycling", *WRAP*, www.wrap.org.uk/sites/files/wrap/Environmental_benefits_of_recycling_2010_update.3b174d59.8816.pdf



Key Environmental Impacts

Key Take Away

1. Though impact of plastic pollution on air, water, soil, freshwater, health, aquatic & marine ecosystem & climate change is well recognized in the region, its quantification with respect to baseline is required at city, national and regional level to identify interventions related to technologies & mitigation and management strategies.

2. Further, in view of the significant income differences (coastal Vs. mainland) population, socio-economic impacts need to be assessed and addressed in the region. e.g. Coastal tourism a subset of cultural services in the natural capital is also affected as tourists seek to avoid beaches known to have high concentrations of plastics litter. Asia-Pacific Economic Cooperation (APEC) forum estimates that the cost of ocean plastics to the tourism, fishing and shipping industries is US$ 1.3 billion in the region alone.

Chapter 5: Major Policy Initiative & Responses

Summary of Regulations

1. Regulations on SWM in the region
2. Ban & restrictions on plastic bags & single use plastic
3. Market Based Instruments for Regulating Plastic Bags & single use plastic
4. Market based instruments on return, collection, recycling and disposal of plastic bags & single use plastic
5. Ban & restrictions on microbeads
6. Voluntary initiatives on microbeads

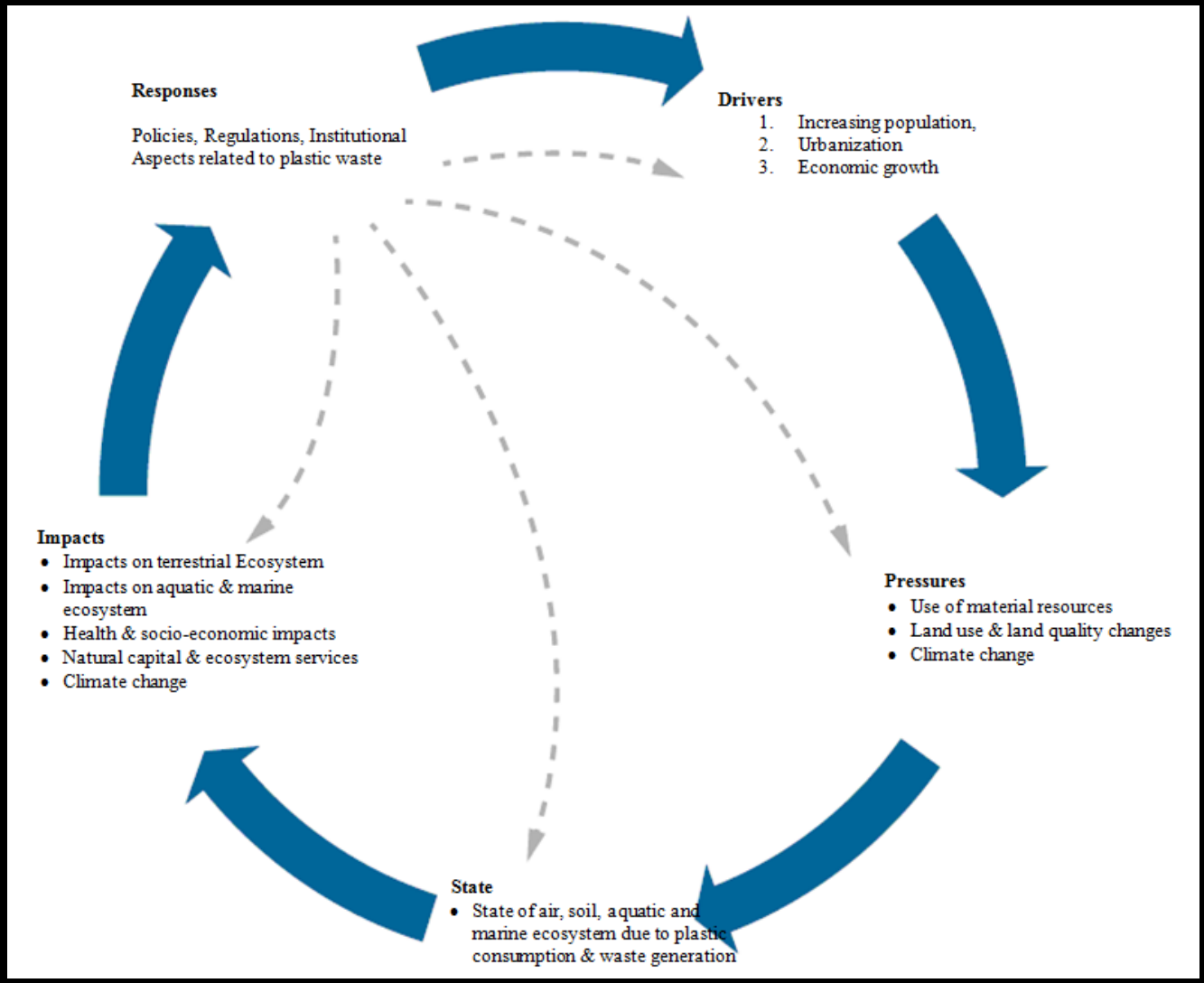
Key Take Away

1. Formulation of regulations to address plastic waste across all the countries in the region is the priority

2. Implementation of regulation with close coordination of institutions and major stakeholders including private sector will address the major issue of plastic waste

Chapter 6: Way Forward

6.0 Introduction
6.1 Summary of Results under DPSIR Framework
6.2 Barriers & Gaps and Potential Interventions
6.3 Plastic Economy Vs. Circular Economy

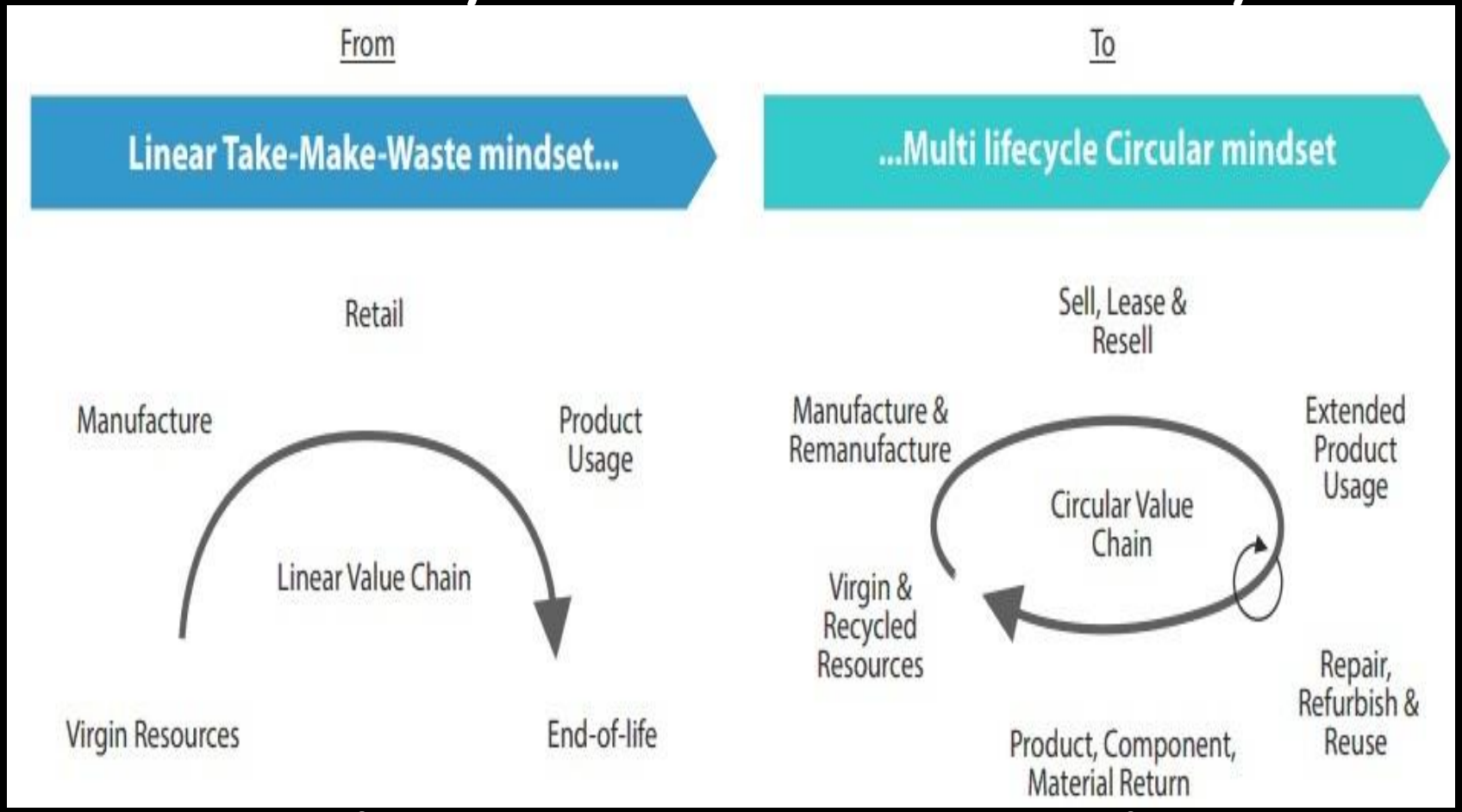


Asia and the Pacific, summary of drivers, pressures, state and trends, and impacts

Major Challenges/ Enablers / Way Forward

1. Policy & Regulatory (Linear Vs. Circularity, 3Rs, Coverage, Type of intervention e.g. ban on items such as single use, ban from landfill, statutory targets for recycling rate, EPR etc.)
2. Economic instrument e.g. resource tax,
3. Technology (Recycling Vs. WtE, Waste plastic sorting, technology for recycling mixed plastics, Thermosets, Alternate materials)
4. Knowledgebase, Data & Information (Baseline data across region; Impacts assessments across terrestrial, aquatic, marine ecosystem, health & socio economics; Human resources/ experts; Indicator monitoring; Capacity building; Sharing of best practices
5. Voluntary measures (Industry led market transforming interventions/ projects, better labeling and declarations on packaging, sustainability reporting SDG 12, 14)

Plastic Economy to Circular Economy & SDGs



From Current Plastic Economy → Circular Economy

Five SDGs (SDG 6, 11, 12, 14 and 15) are relevant to reducing the inputs and impacts of waste plastic on terrestrial & marine ecosystem. Coverage: sustainable management of water and sanitation; sustainable consumption and production; inclusive, safe, resilient and sustainable use of terrestrial & marine ecosystem while ensuring their protection, restoration & conservation.

Plastic Economy to Circular Economy & SDGs (12 & 14) contd..

1. SDG target 12.4 clearly states that “By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment”

2. SDG target 12.5 clearly aims at , “By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.

3. SDG Target14.1 is one of the most important and aims “By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.

THANK YOU

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