

Circular Economic Utilization of Plastics Waste – Challenges and Prospects in Asia-Pacific Region

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Plastics the Incredible and Ubiquitous Material! Where did it come from?



Plastics are derived from materials found in nature, such as natural gas, oil, coal, minerals and plants.

The chemistry of plastics can be complex and encompasses of many polymers.

Global primary plastic production:
270 million tonnes per year

Global plastic waste:
275 million tonnes per year

It can exceed primary production in a given year since it can incorporate production from previous years.

Coastal plastic waste:
99.5 million tonnes per

This is the total of plastic waste generated by all populations within 50 kilometres of a coastline (therefore at risk of entering the ocean).

Mismanaged coastal plastic waste:
31.9 million tonnes per year

This is the annual sum of inadequately managed and littered plastic waste from coastal populations. Inadequately managed waste is that which is stored in open or insecure landfills (and therefore at risk of leakage or loss).

Plastic inputs to the oceans:
8 million tonnes per year

Plastic in surface waters:
10,000s to 100,000s tonnes

There is a wide range of estimates of the quantity of plastics in surface waters. It remains unclear where the majority of plastic inputs end up — a large quantity might accumulate at greater depths or on the seafloor.

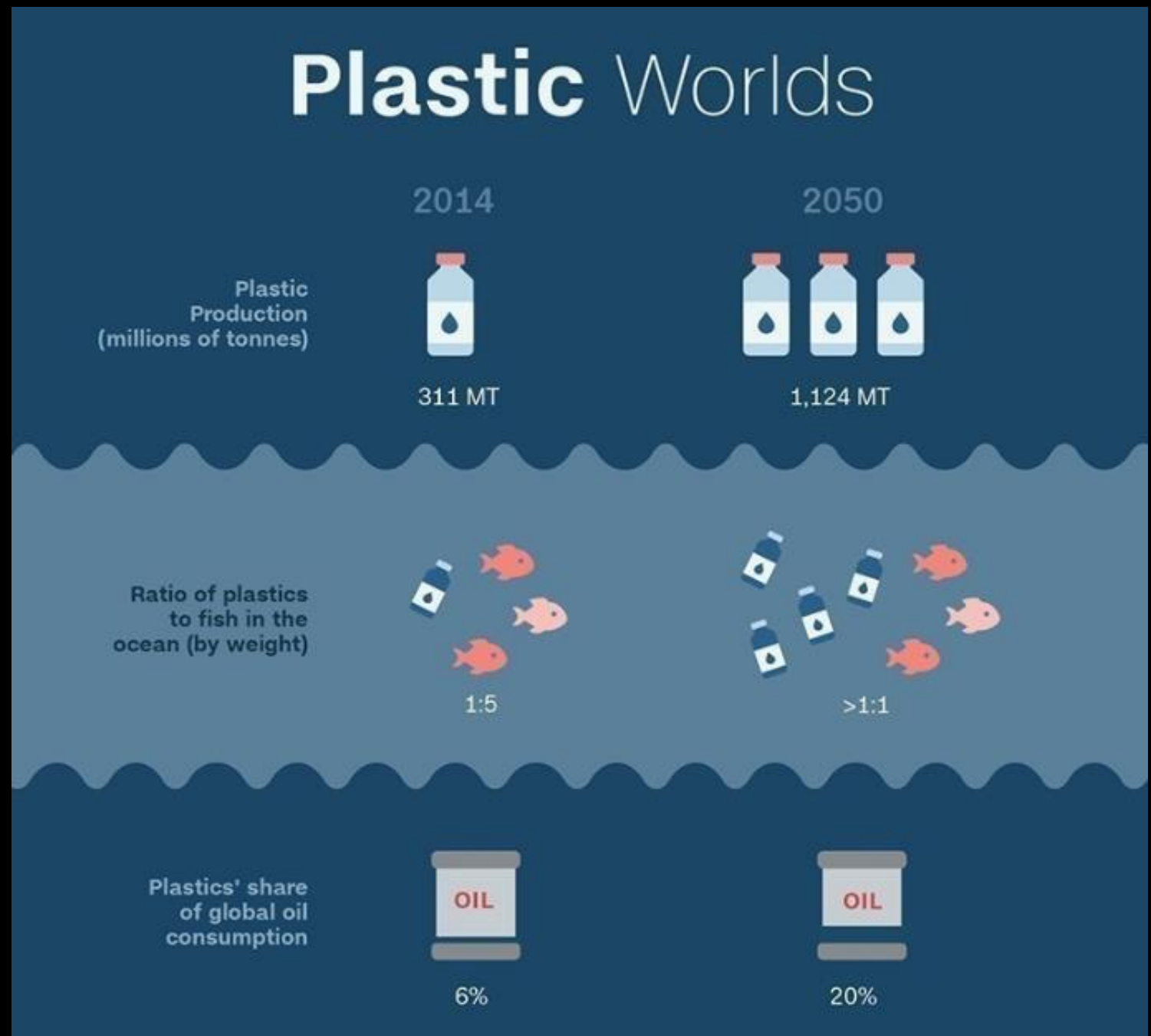
2 billion people living within 50km of coastline

When did Plastic pollution become ever-present ?

Some 4 Mt to 12 Mt of plastics waste is discarded into the oceans annually by countries with ocean coastlines.

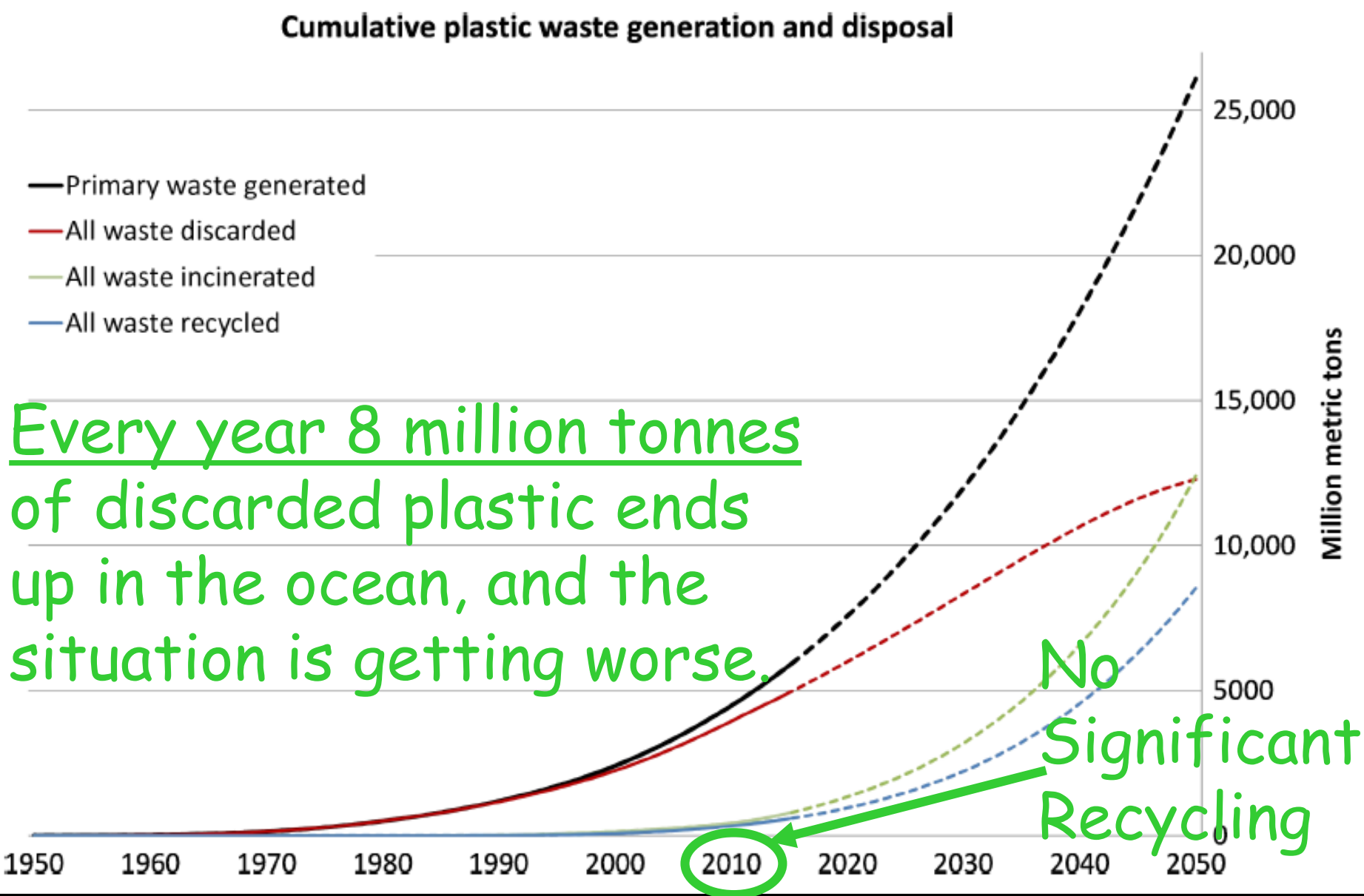
Why plastics pollution so serious in Asia-Pacific region?

PR China,
Indonesia,
the Philippines,
Vietnam and
Thailand.



Generation and disposal

Estimates that, there will be more plastic than fish in the ocean (by weight) by 2050.



Marine plastic pollution costs the world up to \$2.5tn a year, researchers find

Scientists warn that social and economic price of plastic waste to global society has been underestimated

*Significant
Economic Loss
and Damage*

**Plastic Waste Causes
Financial Damage of US\$13
Billion to Marine Ecosystems
Each Year as Concern Grows
over Microplastics**



European Commission

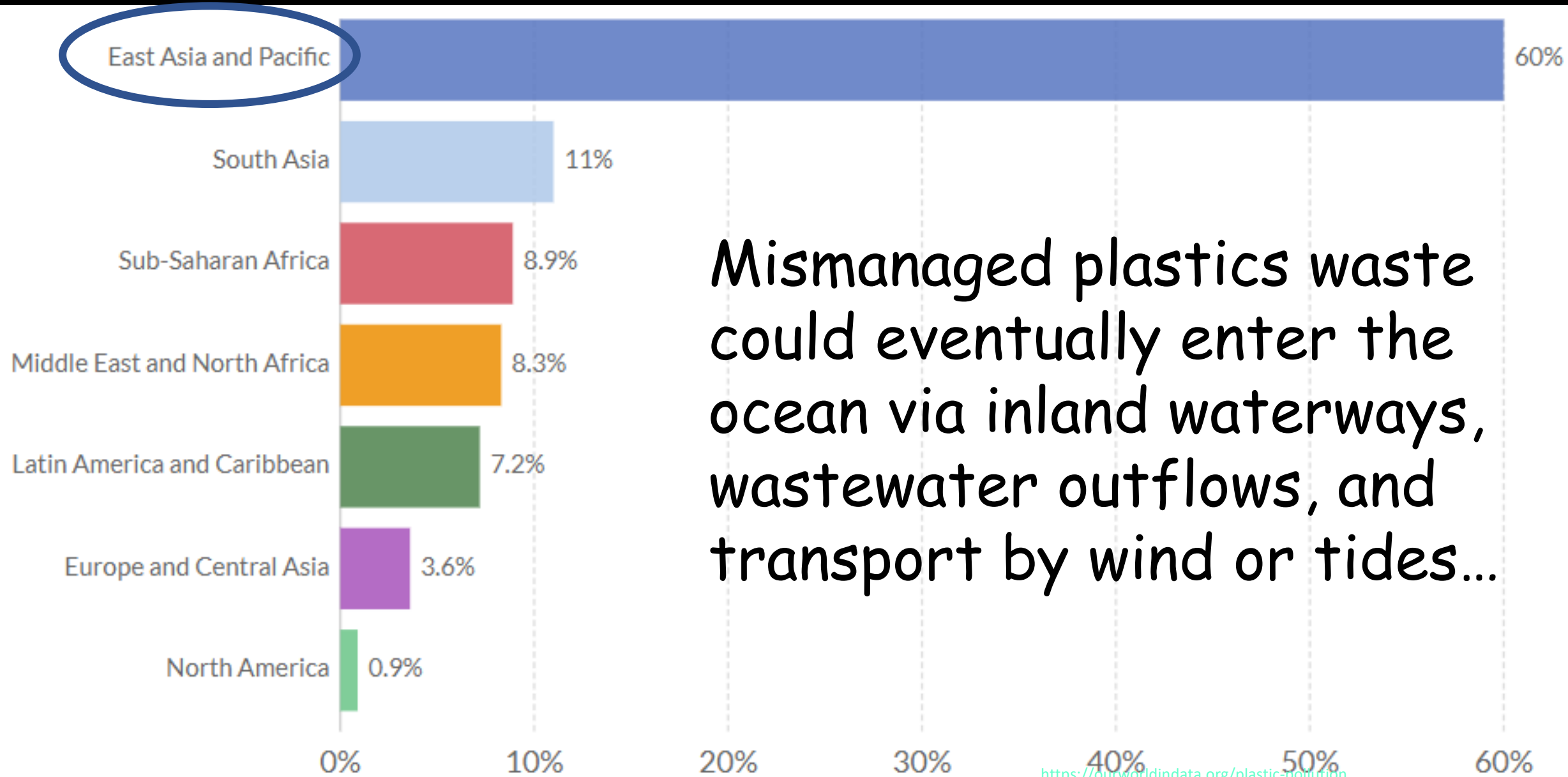


1 December 2011

Marine litter means significant economic damage too

Marine litter not only causes environmental damage, but has significant economic costs for industry. A recent study has now estimated that marine litter in the Asia-Pacific region is likely to cost over US\$1.26billion per year in damage to marine industries. Policy options for reducing this cost are explored.

Global mismanaged plastic by region



Mismanaged plastics waste could eventually enter the ocean via inland waterways, wastewater outflows, and transport by wind or tides...

8 of the world's 10 most polluting rivers are in Asia



- Yangtze...PR CHINA
- Ganges...INDIA, BANGLADESH
- Xi...PR CHINA
- Huangpu...PR CHINA
- Cross...NIGERIA, CAMEROON
- Brantas...INDONESIA
- Amazon...BRAZIL, PERU, COLOMBIA, ECUADOR
- Pasig...PHILIPPINES
- Irrawaddy...MYANMAR
- Solo...INDONESIA

Plastic pollution Size categories

Macro

Meso

Micro

Mini-micro



$\geq 25\text{mm}$

$< 25 - 5\text{mm}$

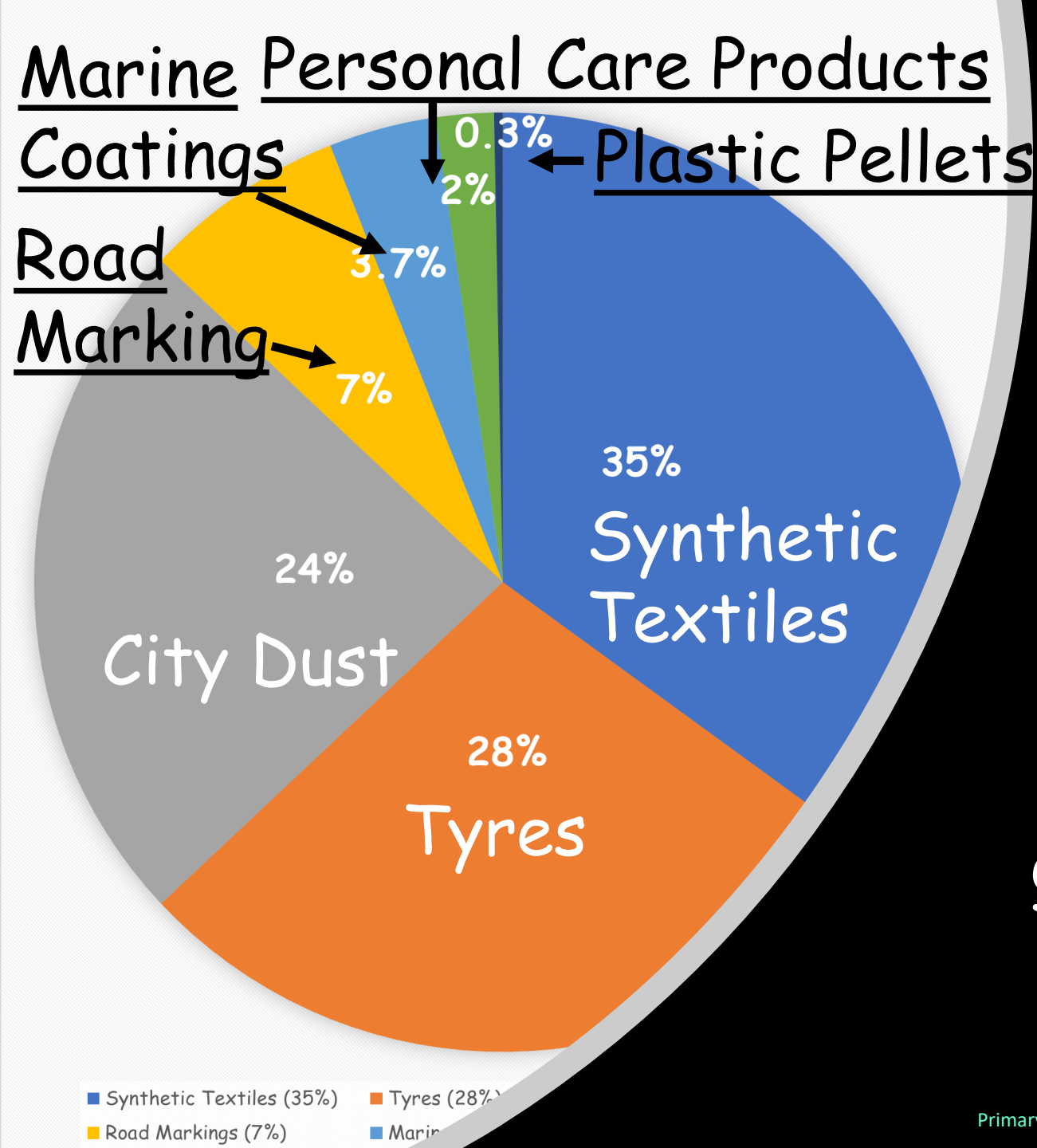
$< 5 - 1\text{mm}$

$< 1\text{mm} - 1\mu\text{m}$

Plastic waste — whether in a river, an ocean, or on land — can persist in the environment for centuries.

Global releases of primary microplastics to the world oceans

Majority (98%) of the losses of primary microplastics are generated during land-based activities



Global releases (%) to the World oceans by geographical area and sources





Plastic debris concentrates POPs by factors of 1,000,000 or more from the surrounding environment (Mato, 2011)

275 MT of plastics waste generated in 2010 with 4.8 to 12.7 MT entering the ocean. The ocean now contains 5.5 trillion pieces of plastics debris (Jambeck, 2015; Erikson, 2014)

Over 690 reported interactions of marine wildlife with plastics debris, including 208 cases of ingestion (Gall, 2015)

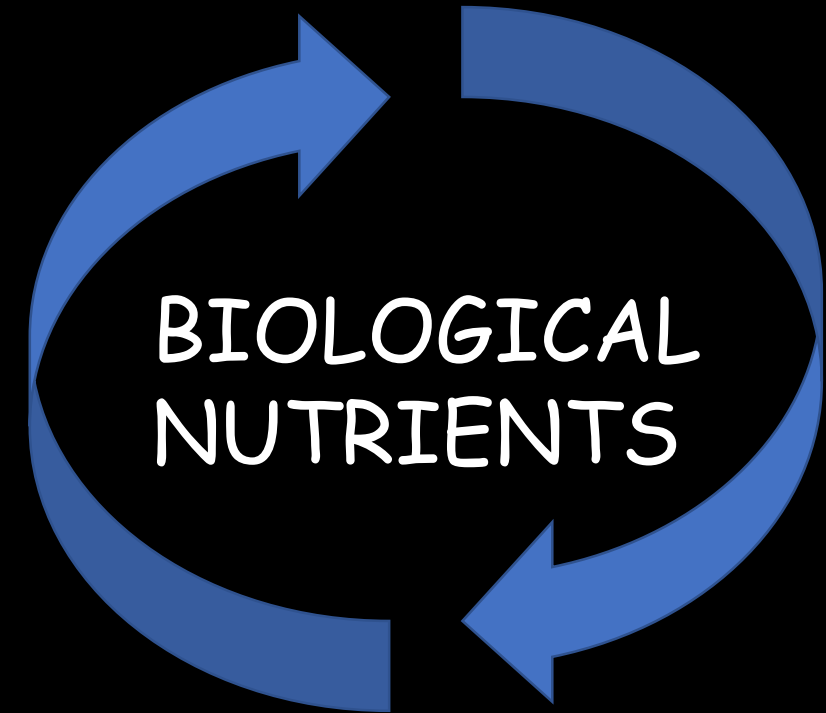
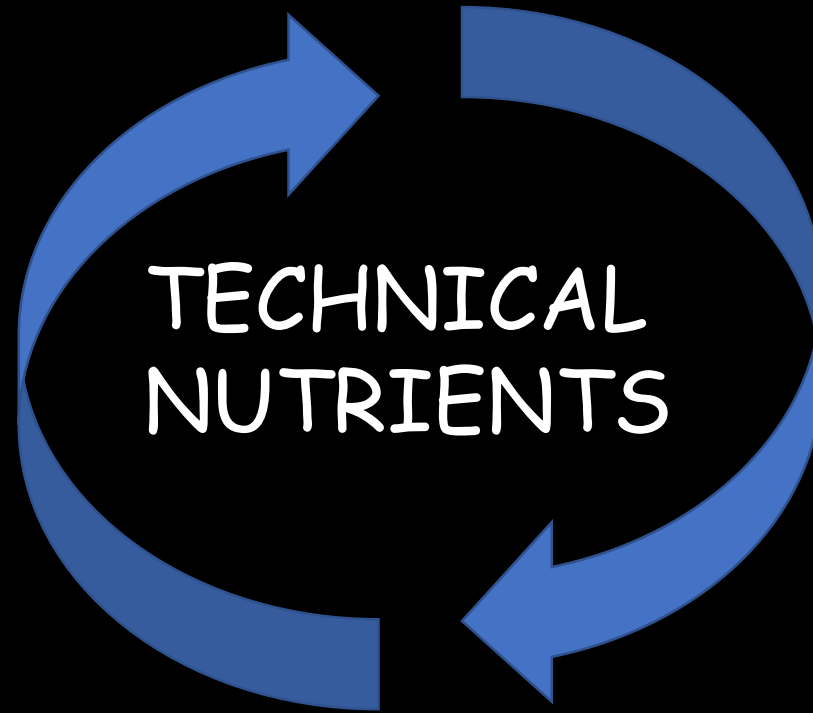
Roughly 12,000 MT of plastic waste will be in landfills or in the natural environment by 2050. (Roland Geyer et al., 2017)

Plastic debris
may facilitate
transfer of POPs
to marine
organisms.

Circular Economy

3 key principles

- ❑ No waste
- ❑ Value is maintained
- ❑ Consider economic framework conditions

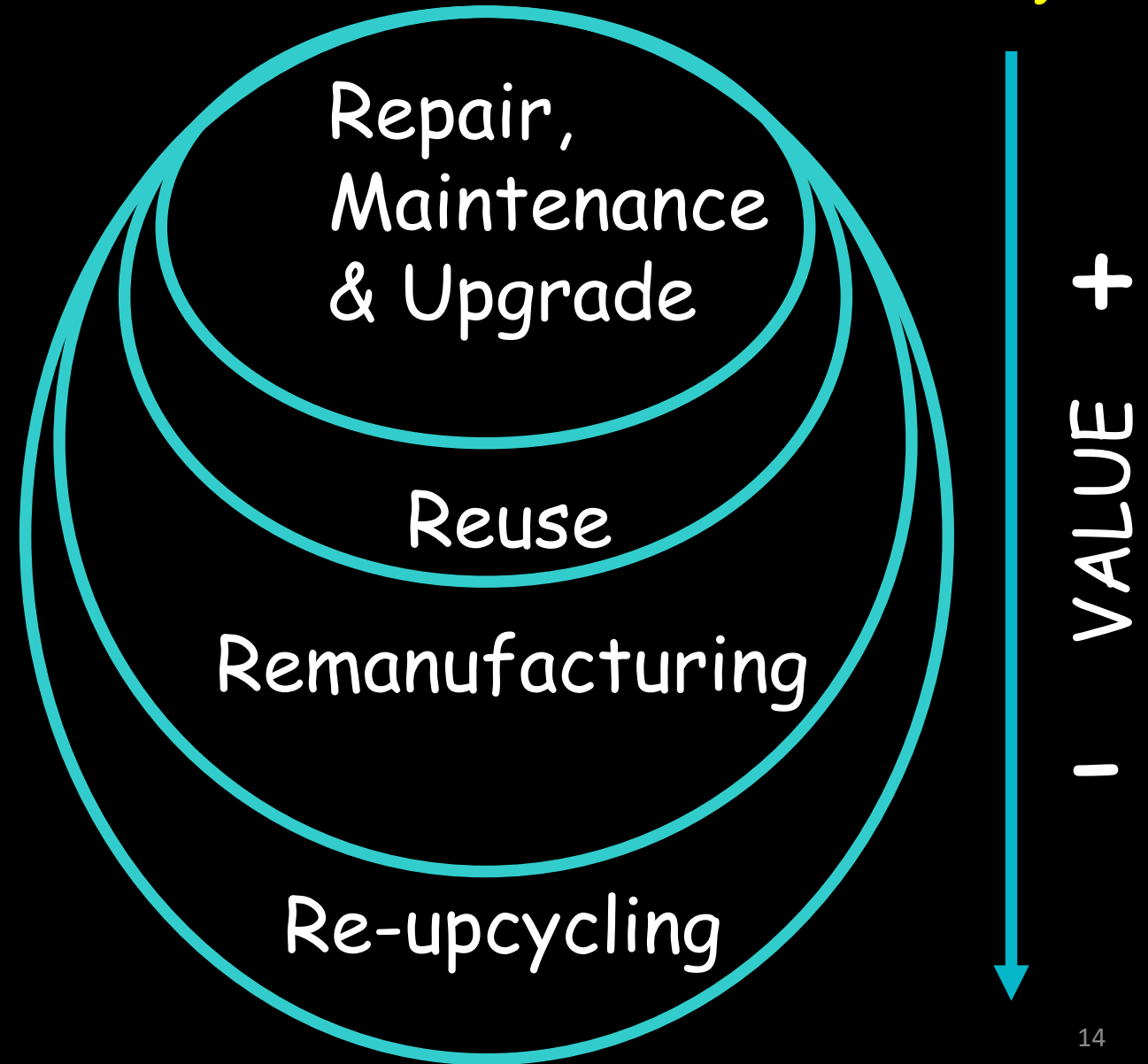


Energy from Renewable Sources

RETHINK: REDUCE-REPAIR-RECYCLE with the rule of 3Rs (REDUCE-REUSE-RECYCLE)

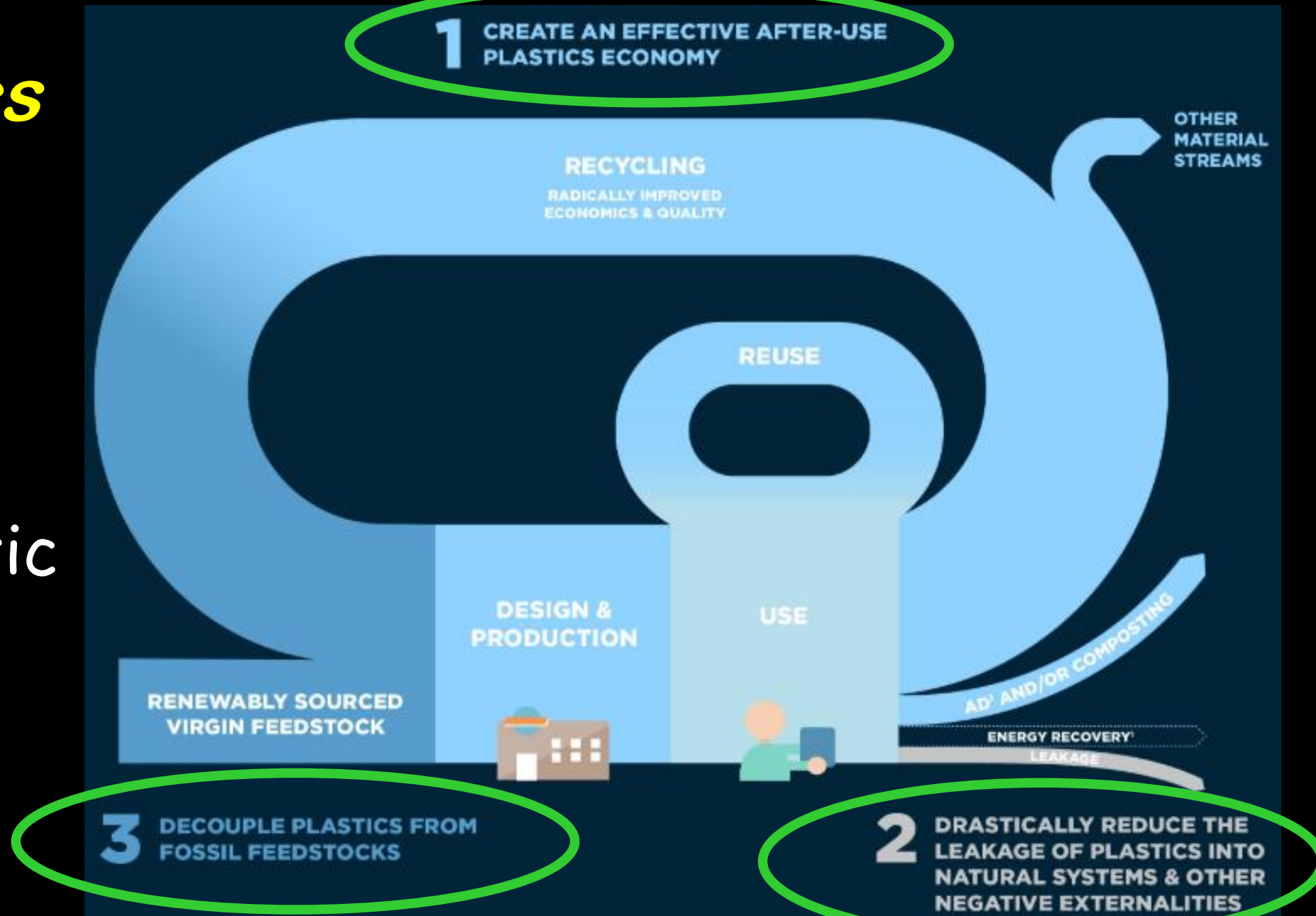
Circular economy connected with 4 loops

"restorative and regenerative by design" and "highest utility and value"



New Plastics Economy

"improving the economics and quality of plastic recycling"

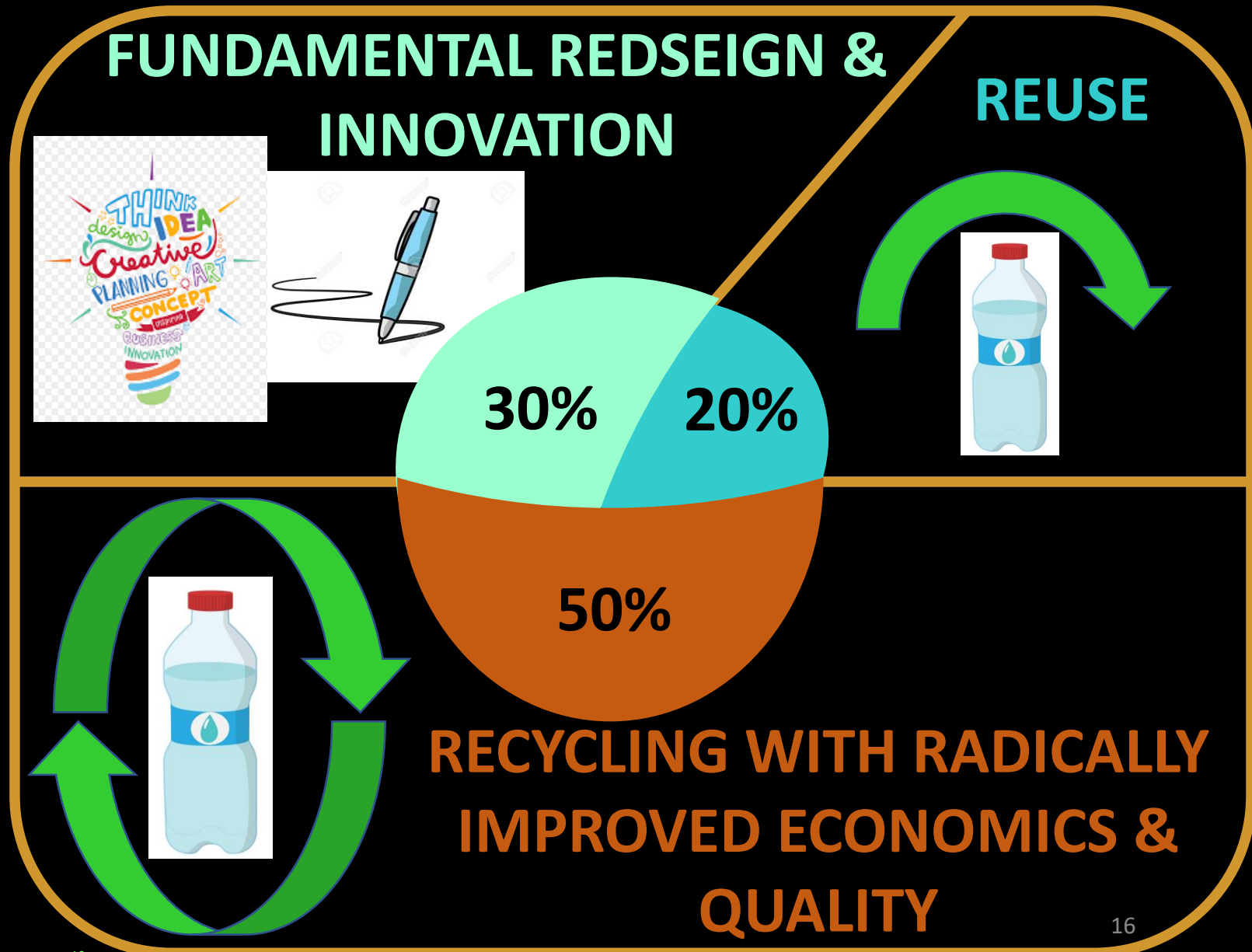


Transitions strategies

□ Re-design, recycle and re-use plastics

□ Re-use is an economically attractive option

□ Recycling pay



Few Recommendations

DPSIR Framework-Responses to reduce the Impact of marine litter

- Identify the main sources and categories
- Utilize end-of-plastic
- Promote greater awareness





Regional 3R Forum in Asia and the Pacific



Tokyo 3R Statement

Singapore Recommendation

Ha Noi 3R Declaration (2013-2023)

Surabaya 3R Declaration

Male 3R Declaration

9th Thailand 2019

Upcoming 10th The Russian Federation 2020

Bangkok 3R Declaration Towards Prevention of Plastic Waste Pollution through 3R and Circular Economy



Adelaide 3R Declaration on Circular Economy

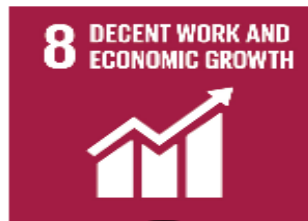
Indore 3R Declaration on Clean Water, Land, Air in Cities

The 2030 Agenda for Sustainable Development Goals



**SUSTAINABLE
DEVELOPMENT**

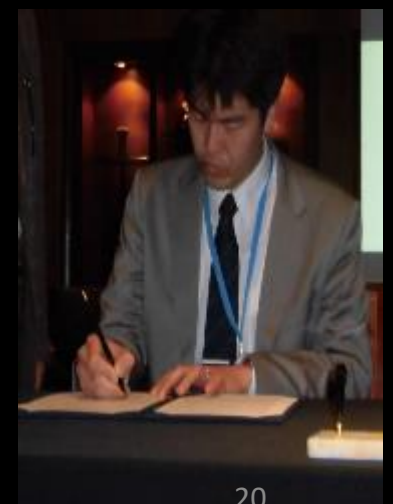
GOALS



Indore 3R Declaration of Asian Mayors on Achieving Clean Water, Clean Land and Clean Air in Cities

46 Mayors signed the voluntary and good-will Indore 3R Declaration (40 Mayors during the 8th Regional 3R Forum 2018 and 6 Mayors during the 9th Regional 3R Forum 2019).

- Sound management of 3Rs
- Circular economic development
- Resource efficiency



Bangkok 3R Declaration Towards Prevention of Plastic Waste Pollution through 3R and Circular Economy

- Identify gaps in existing laws and institutions and regulations
- Develop effective 3R policies and programmes
 - ❖ Prevention of Plastic Waste Pollution
- Support various innovative solutions and necessary research and development programmes
 - ❖ Promotion of 3R and Circular Economy
- Promote multilayer collaboration
- Attach significance of 3R and circular economy

Welcome to all

**10th Regional 3R Forum in Asia and the
Pacific
2020**

The Russian Federation

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