PERAN KKP DALAM MENANGANI SAMPAH LAUT DI INDONESIA

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Direktorat Jenderal Pengelolaan Ruang Laut

Disampaikan pada acara :
Seminar Kesehatan Nasional:
"Aquatic Life and Its Sustainability on the Health of Ecosystem and HumanBeings"

Jakarta, 21 September 2019

POTENSI WILAYAH PERAIRAN INDONESIA

INDONESIA NEGARA MARITIM

INDONESIA NEGARA MARITIM
Pidato Presiden Joko Widodo
20 Oktober 2014

"Kita harus bekerja dengan sekeras-kerasnya untuk mengembalikan Indonesia sebagai negara maritim. **SAMUDRA, LAUT, SELAT DAN TELUK ADALAH MASA DEPAN PERADABAN KITA.** Kita telah terlalu lama memunggungi laut, memunggungi samudra, memunggungi selat dan teluk. Kini saatnya kita mengembalikan semuanya sehingga Jalesveva Jayamahe, di laut justru kita jaya, sebagai semboyan nenek moyang kita di masa lalu, bisa kembali membahana."

KONTRIBUSI WP3K SEBAGAI PENYEDIA SDA

1. Menopang 85% kehidupan biota laut tropis

2. Menghasilkan 80-90% output perikanan nasional

VISI DAN MISI KKP

Target Renstra: **Pertumbuhan PDB Perikanan 12% di Tahun 2019**

- Misi KKP dalam mencapai visi Pemerintah **"Laut Masa Depan Bangsa"**

PEMBAGIAN TUGAS 3 PILAR MISI KKP

MISI Kedaulatan *(Sovereignty)*

MISI Keberlanjutan *(Sustainabiltiy)*

MISI Kesejahteraan *(Prosperity)*

1. **PSDKP** : Pengawasan pengelolaan sumberdaya kelautan dan perikanan
2. **BKIPM** : Perkarantinaan ikan, pengendalian mutu, keamanan hasil perikanan, dan keamanan hayati ikan
3. **DJPRL** : Pengelolaan ruang laut, konservasi dan keanekaragaman hayati laut
4. **DJPT & DJPB** : Keberlanjutan usaha perikanan tangkap dan budidaya
5. **DJPDS** : Daya saing dan sistem logistik hasil kelautan dan perikanan
6. **BRSDM KP**: Inovasi iptek, SDM dan pemberdayaan masyarakat

PENGELOLAAN RUANG LAUT INDONESIA

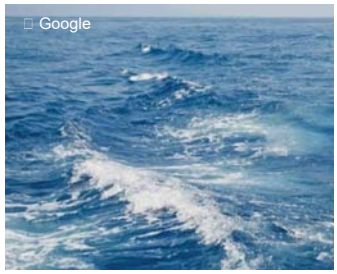
Pembentukan kawasan konservasi

Rehab lingkungan laut

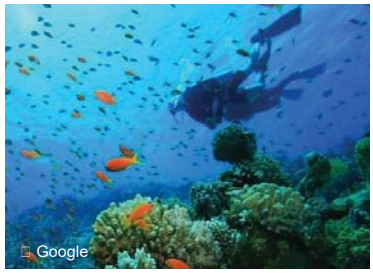
Gerakan bersih pantai dan laut

Penanganan biota laut terdampar

Perlindungan spesies ekonomis dan dilindungi



Pembuatan zonasi ruang laut



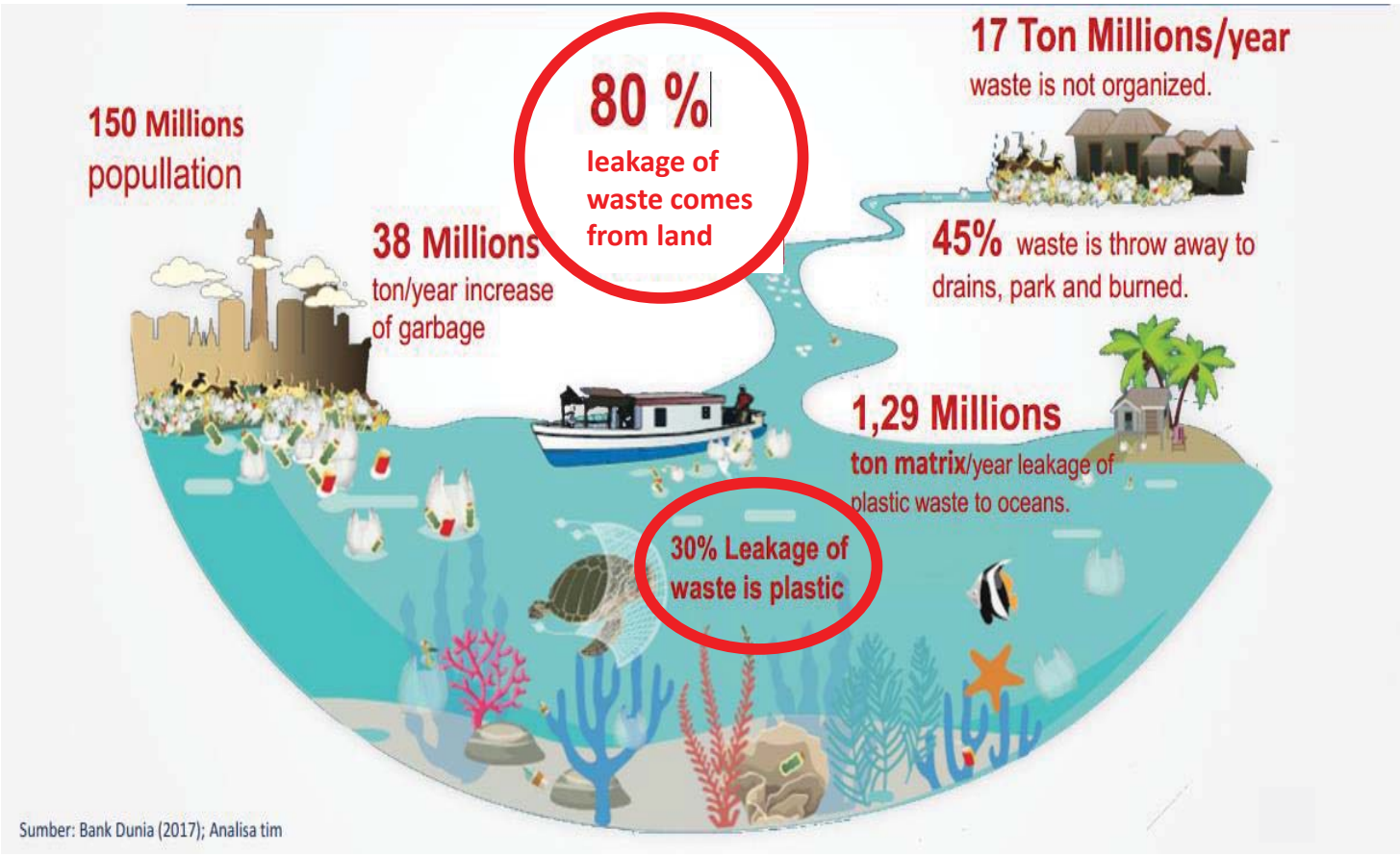
Peningkatan wisata bahari

Pemberdayaan masyarakat pesisir

ISU DAN PERMASALAHAN KELAUTAN INDONESIA

KEBOCORAN SAMPAH KE LAUT

80% sampah berasal dari darat, 20% dari arus dan kegiatan lain di laut



SUMBER SAMPAH DI LAUT

Pada tahun 2025, laut akan berisi **1 ton plastik per 3 ton ikan**, dan di tahun 2050, **plastik jauh lebih banyak dari ikan**

Sumber:
Modifikasi dari EEA, 2015

WAJAH SUNGAI INDONESIA

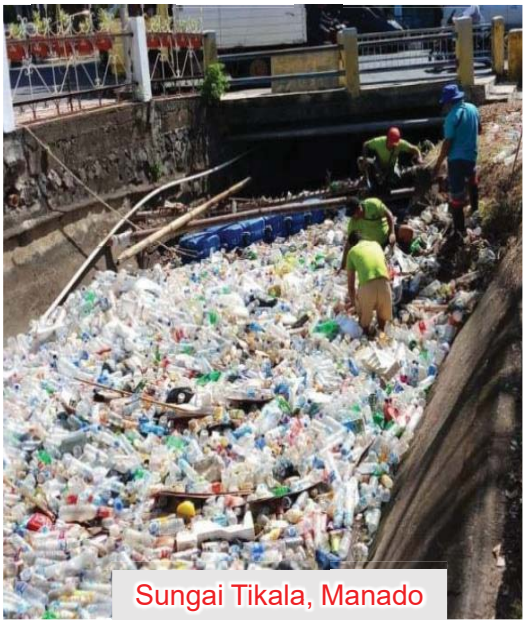

Kali di Cipinang, DKI Jakarta


DAS Citarum, Jawa Barat


Sungai Cikapundung, Bandung

Kali Brantas, Jawa Timur


Kali Bahagia, Bekasi


Sungai Tikala, Manado


Sungai Winongo, Yogyakarta

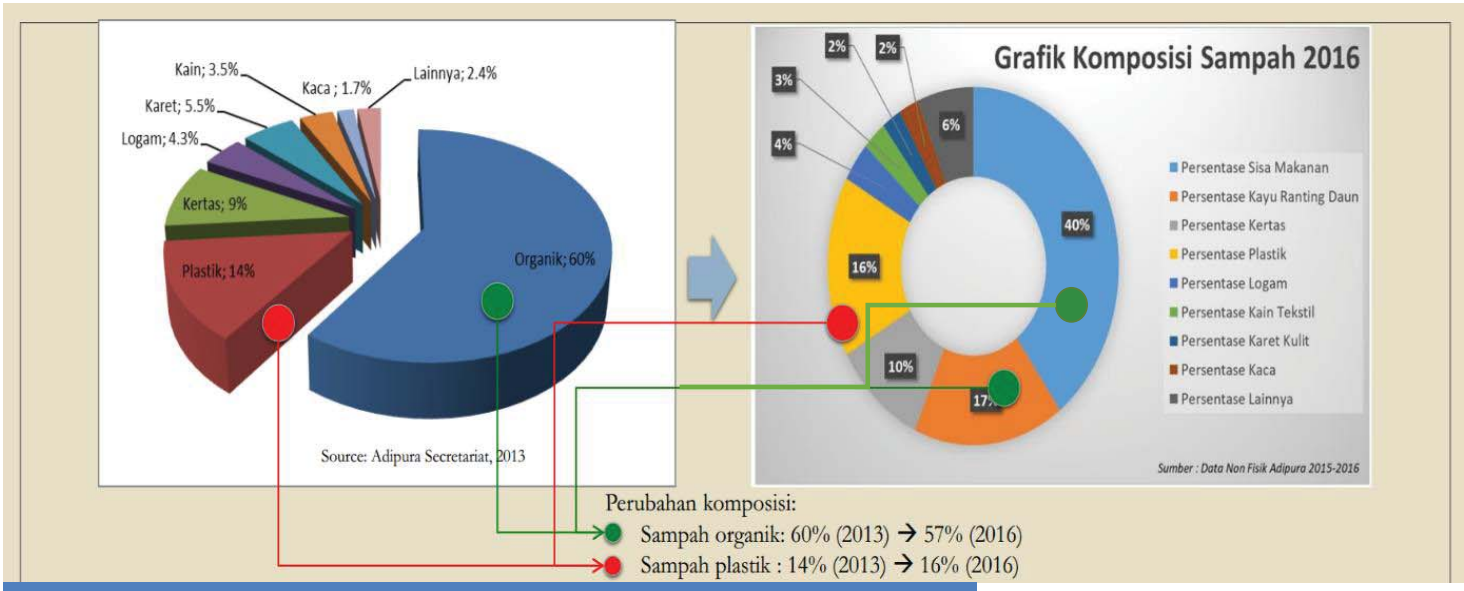

Sungai Deli, Medan

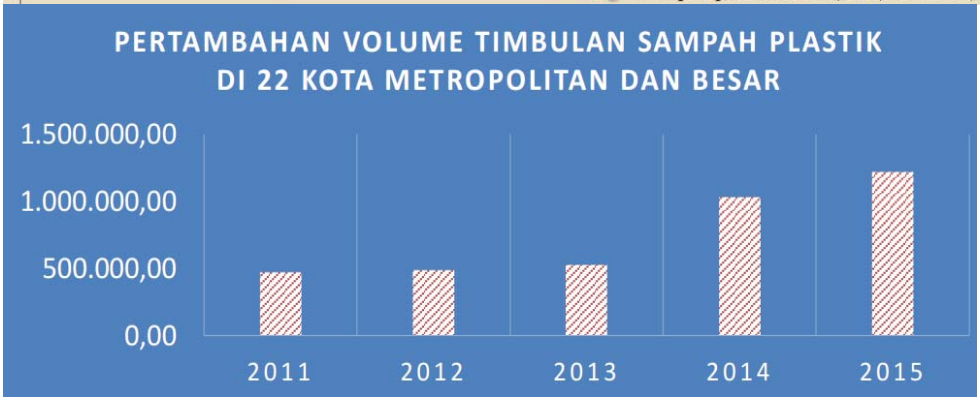
10 BESAR SAMPAH YANG DIHASILKAN DUNIA

Berdasarkan Laporan *International Coastal Cleanup 2018* yang dilaksanakan oleh *Ocean Conservancy* pada tanggal 15 September 2018, (KKP ikut berpartisipasi), Dari total sampah terkumpul sebesar 20.824.689 jenis sampah, berikut adalah 10 jenis sampah terbanyak yang ditemukan:

1. **Puntung Rokok**
   2,412,151
2. **Pembungkus Makanan**
   1,739,743
3. **Botol Minuman Plastik**
   1,569,135
4. **Tutup Botol Plastik**
   1,091,107
5. **Kantong Kresek**
   757,523
6. **Kantong Plastik Lainnya**
   746,211
7. **Sedotan dan Pengaduk**
   643,562
8. **Wadah Plastik**
   632,874
9. **Tutup Minuman Plastik**
   624,878
10. **Wadah Styrofoam**
    580,570

KOMPOSISI SAMPAH NASIONAL





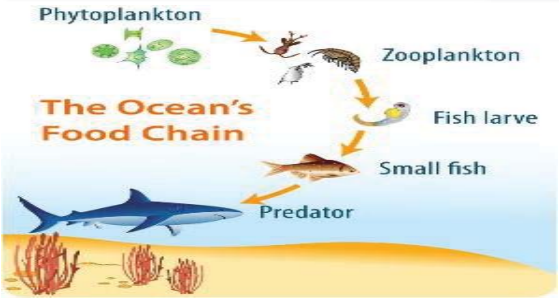
Terjadi peningkatan pada prosentase sampah plastik dari 14% di tahun 2013 menjadi 16% di tahun 2016

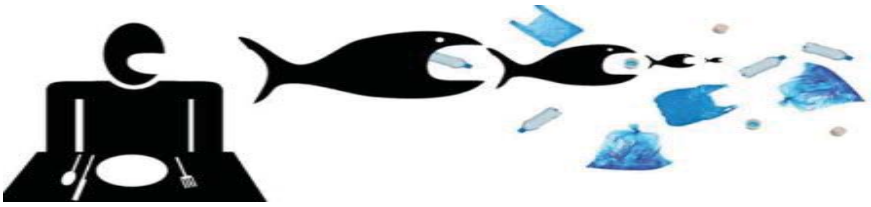
Sumber : KLHK, 2017

DAMPAK SAMPAH YANG MASUK KE LAUT

MENGGANGGU SEKTOR PARIWISATA

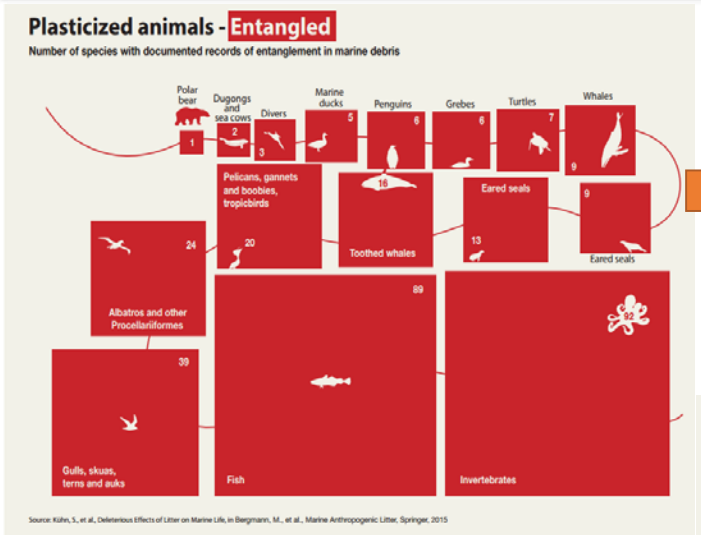
KEHIDUPAN BIOTA LAUT DAN EKOSISTEM PESISIR

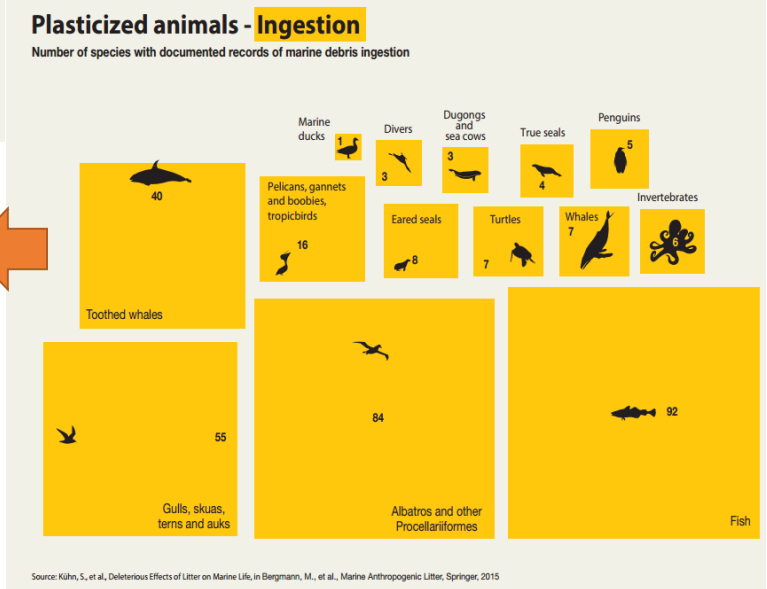




RANTAI MAKANAN

DAMPAK SAMPAH PLASTIK PADA BIOTA LAUT





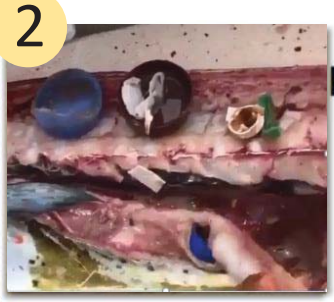
HASIL PENELITIAN KANDUNGAN PLASTIK PADA IKAN DAN BIOTA LAUT LAINNYA

Ikan Purba dari Perairan Sulawesi Utara

1

The living fossil "**coelacanth**: captured by fisherman, found consuming marine plastic debris, captured in Manado Bay, North Sulawesi (Newspaper, Tribun Manado, may 24th, 2012)

2



Isi Perut Ikan Mahi-Mahi, Costarica, Desember 2017

3 **Joint Study**
Hassanudin Univ. & UC Davis
24 Desember 2015

PAOTERE FISH MARKET: Makassar

76 ikan dari 11 species
28 % ikan dan 55% spesies yang menjadi sampel memakan plastic debris ukuran 0.1 – 1.6 mm

HALFMOON BAY FISH MARKET: California

64 ikan dari 12 species dan 12 kerang2an.
25% ikan dan 67% spesies yang menjadi sampel memakan fiber debris ukuran 0.3 – 5.9 mm

4

SCIENTIFIC REPORTS

OPEN

Anthropogenic debris in seafood: Plastic debris and fibers from textiles in fish and bivalves sold for human consumption

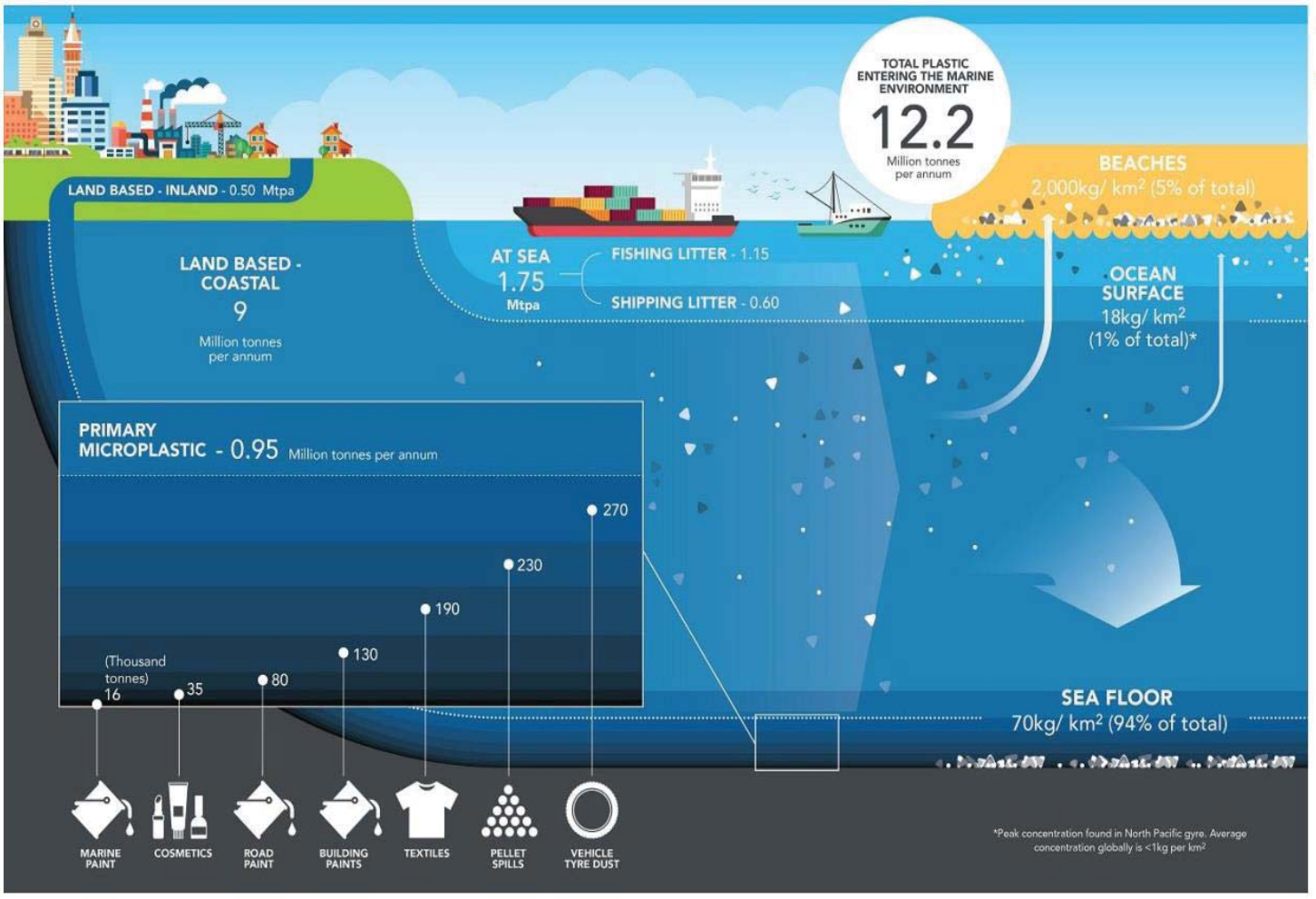
Received: 01 April 2015
Accepted: 25 August 2015
Published: 24 September 2015

Chelsea M. Rochman[1], Akbar Tahir[2], Susan L. Williams[3], Dolores V. Baxa[3], Rosalyn Lam[3], Jeffrey T. Miller[4], Foo-Ching Teh[3], Shinta Werorilangi[2] & Swee J. Teh[1]

5

Plastik ukuran 0,2mm di temukan pada ikan Teri **(LIPI, 2017)**

SUMBER MIKROPLASTIK DI LAUT

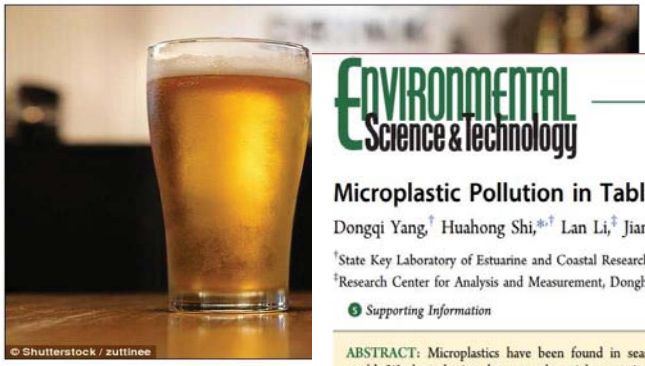


HASIL PENELITIAN KANDUNGAN MIKROPLASTIK PADA AIR MINUM DAN GARAM

Microplastics can even be found in BEER: Study reveals the average US brew contains over four man-made particles per liter

- Beer, on average, has 4.05 man-made particles, mostly plastic fibers, per liter
- Study used 12 beer brands brewed with water from five Laurentian Great Lakes
- Concentration of plastics in the beer was different than in the municipal water
- Microplastics are found in 93 percent of bottled water from around the world

By MOLLIE CAHILLANE FOR DAILYMAIL.COM
PUBLISHED: 06:41 AEST, 1 May 2018 | **UPDATED:** 07:01 AEST, 1 May 2018



You could be ingesting a teaspoon of microplastic every week, study finds

ABC Newcastle By Ben Millington
Updated 12 Jun 2019, 9:45pm

c as all the preceding years combined.

LATED STORY: Plastic straws and cutlery to be scrapped in nada, Trudeau announces

LATED STORY: Single-use straws, cutlery and plates rapped under EU ban

LATED STORY: Diver films wave of plastic pollution on scale

Environmental Science & Technology

Article

pubs.acs.org/est
DOI: 10.1021/acs.est.5b03163
Environ. Sci. Technol. 2015, 49, 13622−13627

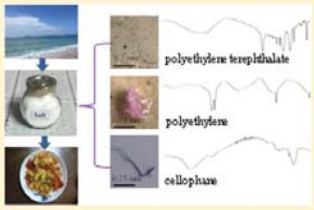
Microplastic Pollution in Table Salts from China

Dongqi Yang,[†] Huahong Shi,*[†] Lan Li,[‡] Jiana Li,[†] Khalida Jabeen,[†] and Prabhu Kolandhasamy[†]

[†]State Key Laboratory of Estuarine and Coastal Research, East China Normal University, Shanghai 200062, China
[‡]Research Center for Analysis and Measurement, Donghua University, Shanghai 201620, China

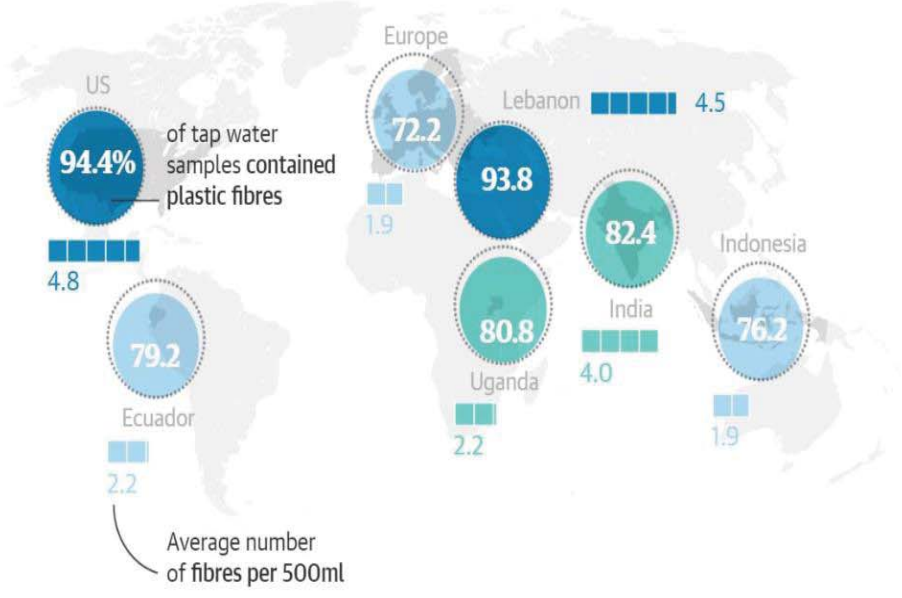
Supporting Information

ABSTRACT: Microplastics have been found in seas all over the world. We hypothesize that sea salts might contain microplastics, because they are directly supplied by seawater. To test our hypothesis, we collected 15 brands of sea salts, lake salts, and rock/well salts from supermarkets throughout China. The microplastics content was 550−681 particles/kg in sea salts, 43−364 particles/kg in lake salts, and 7−204 particles/kg in rock/well salts. In sea salts, fragments and fibers were the prevalent types of particles compared with pellets and sheets. Microplastics measuring less than 200 μm represented the majority of the particles, accounting for 55% of the total microplastics, and the most common microplastics were polyethylene terephthalate, followed by polyethylene and cellophane in sea salts. The abundance of microplastics in sea salts was significantly higher than that in lake salts and rock/well salts. This result indicates that sea products, such as sea salts, are contaminated by microplastics. To the best of our knowledge, this is the first report on microplastic pollution in abiotic sea products.



HASIL PENELITIAN KANDUNGAN MIKROPLASTIK PADA AIR MINUM DAN GARAM

Microplastics in drinking water

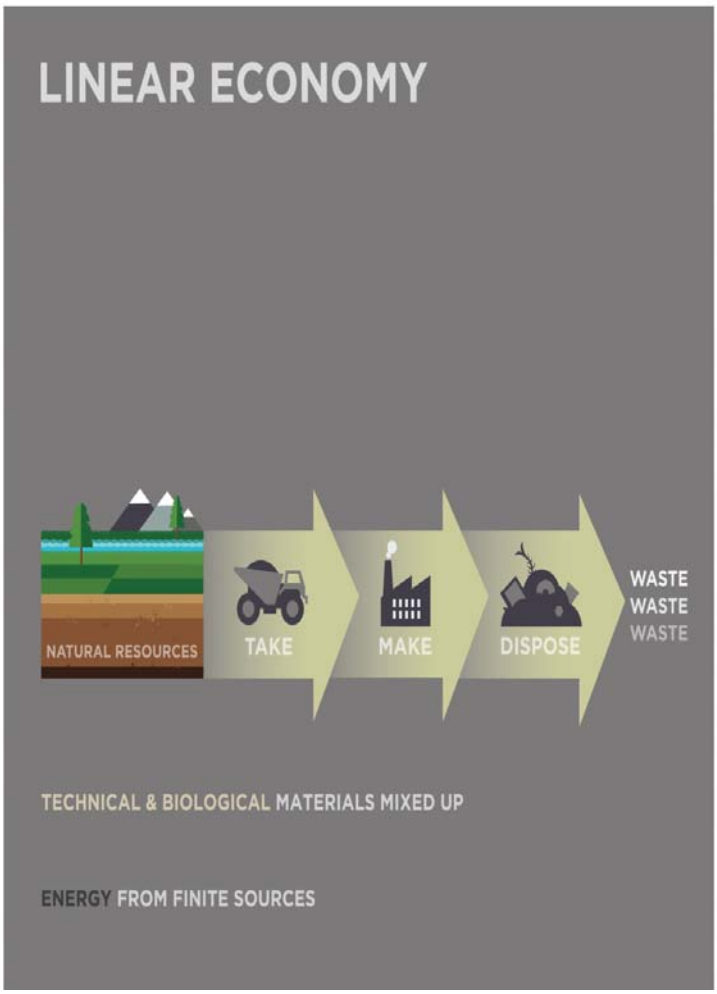


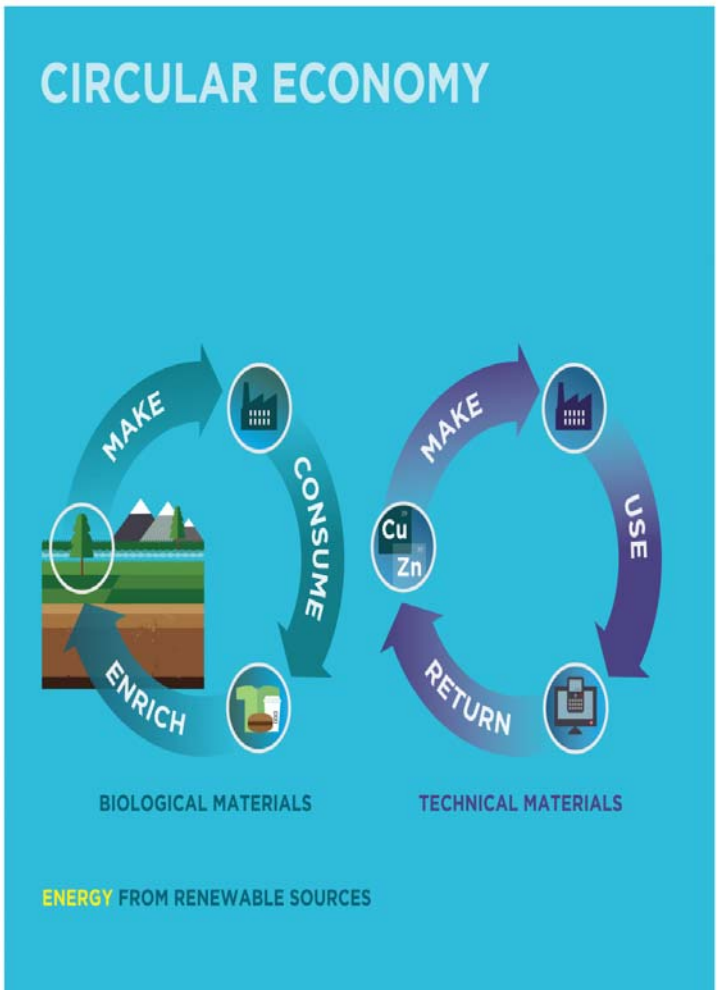
Guardian graphic | Source: Orb Media

- Worldwide survey:
  - » Tap water:
    0 – 60.9 $MP_{>2.5}/L$
  - » Bottled water:
    0 – 46 $MP_{>100}/L$
    0 – 10,351 $MP_{>6.5}/L$

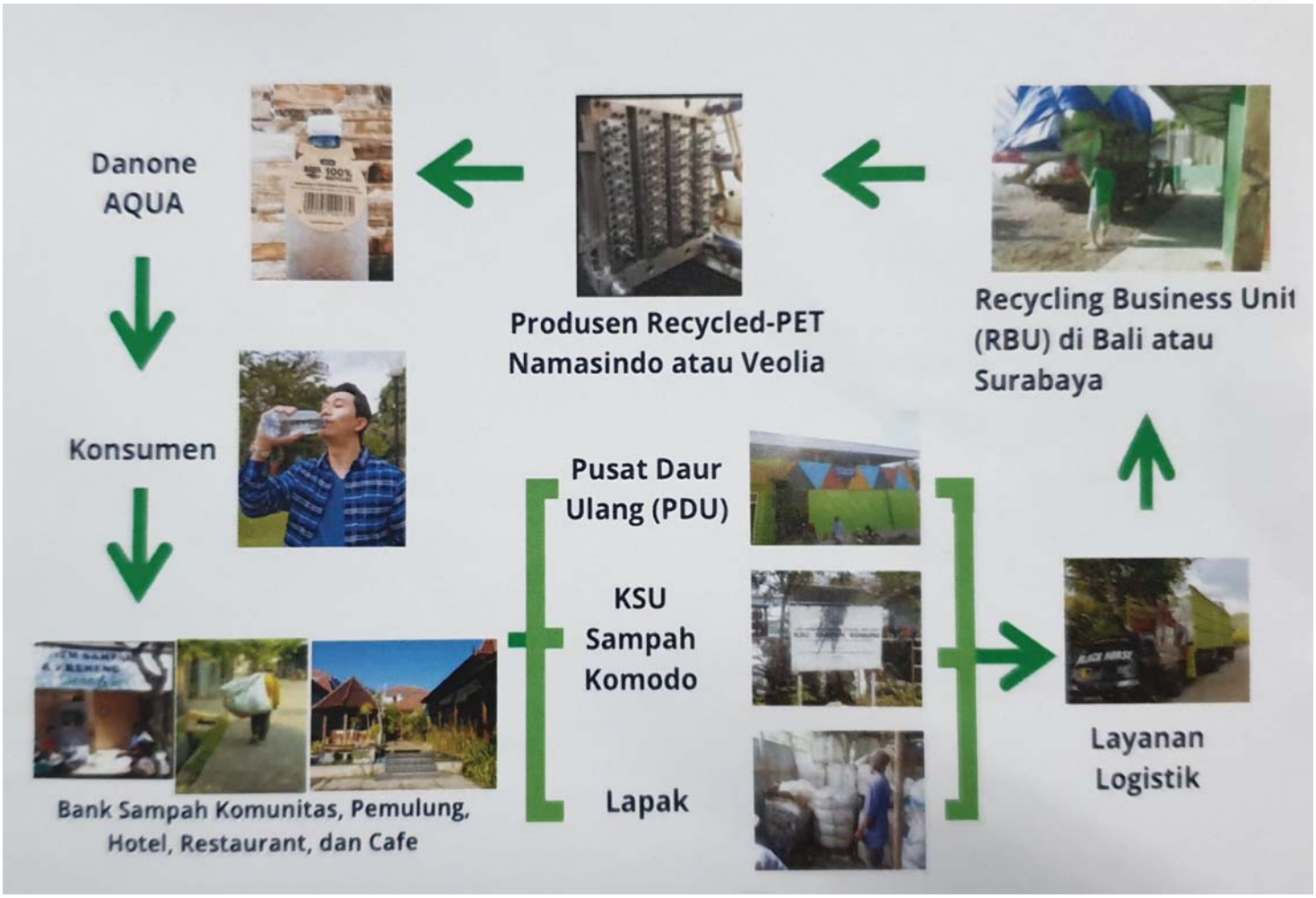
Mason et al (2017), Kosuth et al (2018), Mason et al (2018)

PERUBAHAN PARADIGMA PENGELOLAAN SAMPAH



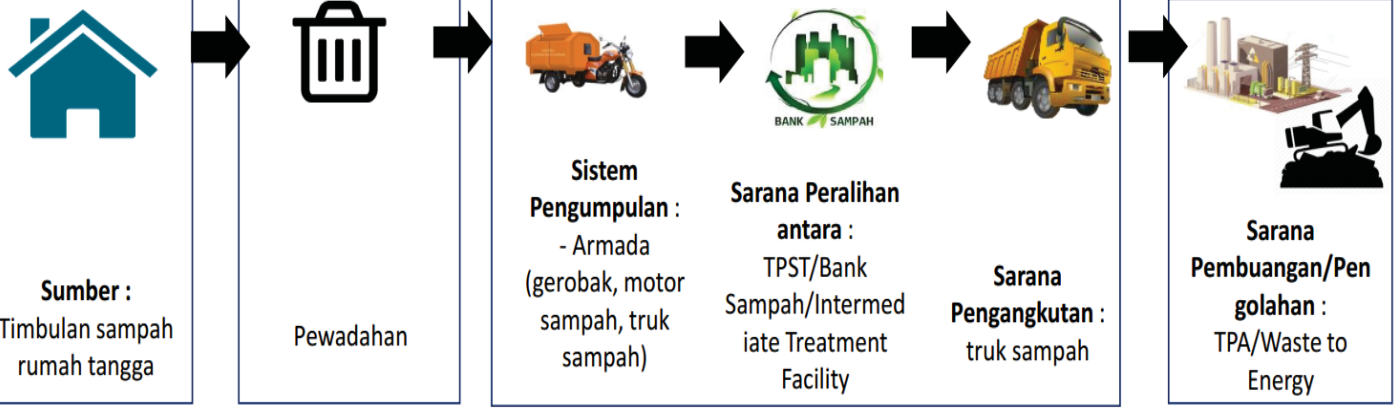


CIRCULAR ECONOMY DAN PUBLIC PRIVATE PARTNERSHIP



TATA KELOLA PERSAMPAHAN UNTUK MENCEGAH KEBOCORAN SAMPAH YANG AKAN MASUK KE LAUT

- Pelatihan 3R
- Pengadaan wadah
- Pendampingan 3R dan Circular Economy
- Pendampingan Bank SampahPembangunan TPS 3R dan ITF
- Pembangunan TPA
- Waste to Energy
- Operasional TPA
- Monitoring



Sumber : Timbulan sampah rumah tangga

Pewadahan

Sistem Pengumpulan : - Armada (gerobak, motor sampah, truk sampah)

Sarana Peralihan antara : TPST/Bank Sampah/Intermediate Treatment Facility

Sarana Pengangkutan : truk sampah

Sarana Pembuangan/Pengolahan : TPA/Waste to Energy

- Masyarakat
- Kemenkes
- Kemendikbud
- KLHK
- Kemenkominfo
- Swasta

- Masyarakat
- Pemerintah Daerah
- Swasta

- Masyarakat
- Pemda
- KLHK
- Ditjen Cipta Karya,
- PUPR
- Swasta

- Pemerintah Daerah
- Swasta

- Ditjen Cipta Karya, Kemen PUPR
- Pemerintah Daerah
- Swasta

Stakeholder

Memerlukan dukungan

Sumber :Bappenas & diolah

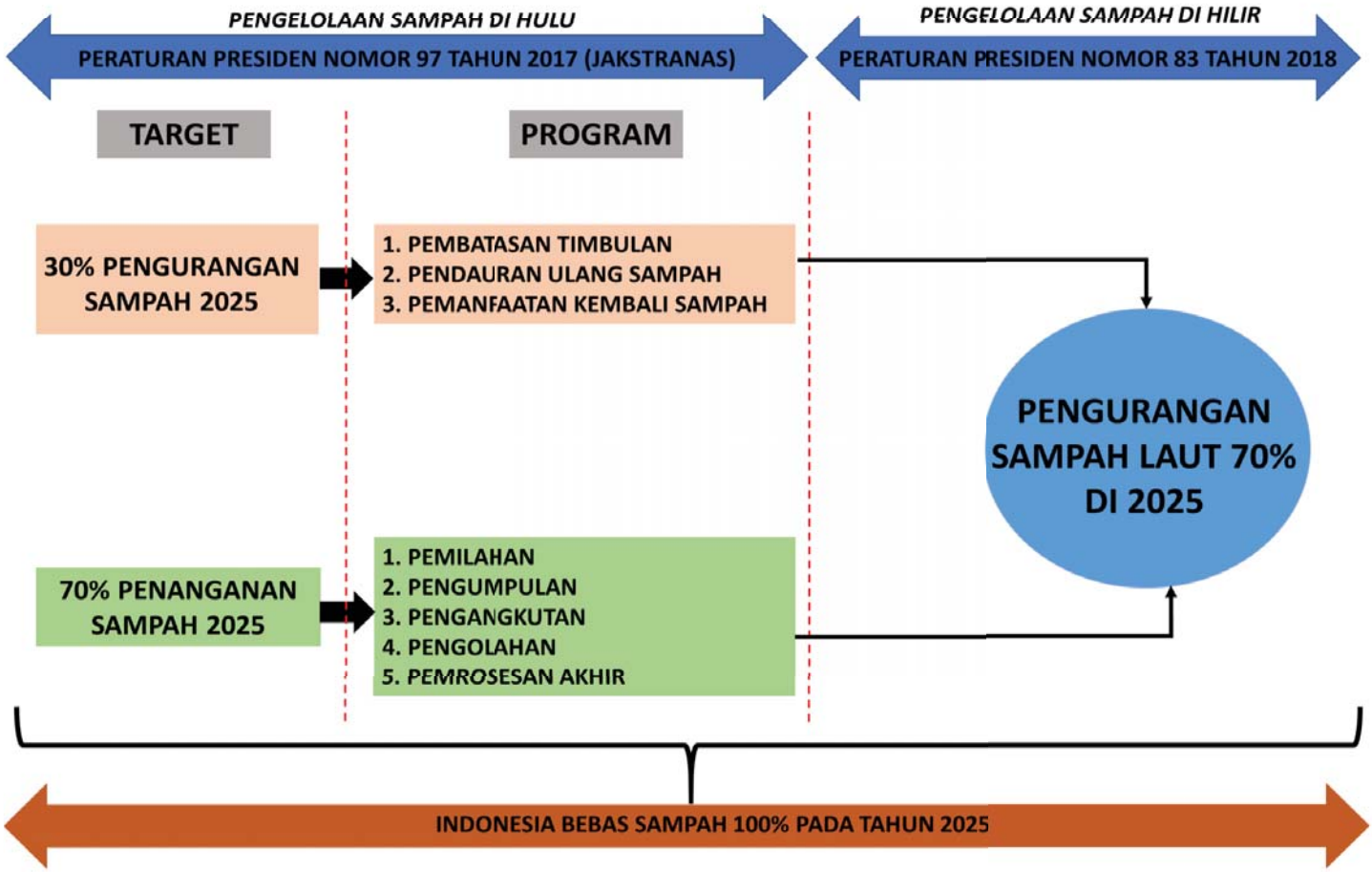
REGULASI PERSAMPAHAN DI INDONESIA

Ujung Tombak Penanganan Sampah di Indonesia

1. **UU 18/2008** tentang **Pengelolalaan Sampah**
2. **UU 23/2014** tentang **Pemerintahan Daerah**
3. **PP 81/2012** tentang **Pengelolaan Sampah Rumah Tangga & Sampah sejenis Sampah Rumah Tangga**
4. **Perpres 97/2017** tentang **Jakstranas Pengelolaan Sampah Rumah Tangga dan Sampah sejenis Sampah Rumah Tangga**
5. **Perpres 35/2018** tentang **Percepatan Pembangunan Instalasi Pengolahan Sampah Menjadi Energi Listrik Berbasis Teknologi Lingkungan**
6. **Perpres 83/2018** tentang **Penanganan Sampah Laut**
7. **Permen PU 03/2013** tentang **Penyelenggaraan P/S Persampahan dalam Penanganan Sampah RT & Sampah Sejenis Sampah RT**
8. **Perpres 15/2018** tentang **percepatan pengendalian pencemaran dan kerusakan Daerah Aliran Sungai Citarum**

TINDAKLANJUT OLEH KEMENTERIAN/LEMBAGA

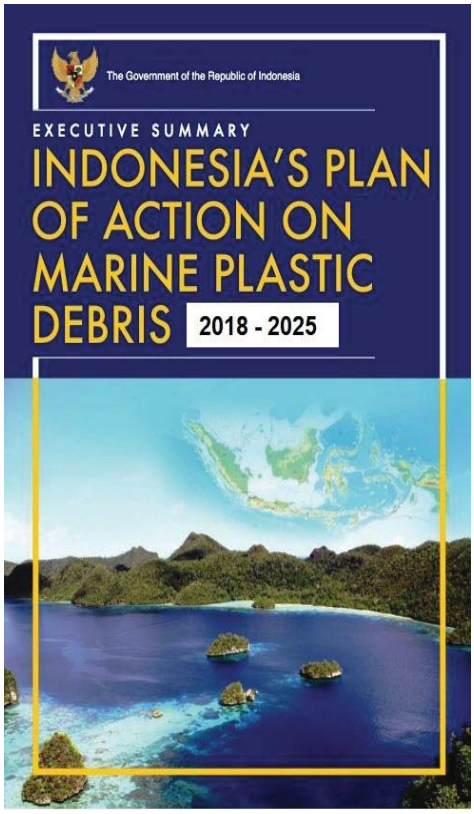
KOMITMEN PEMERINTAH INDONESIA *)

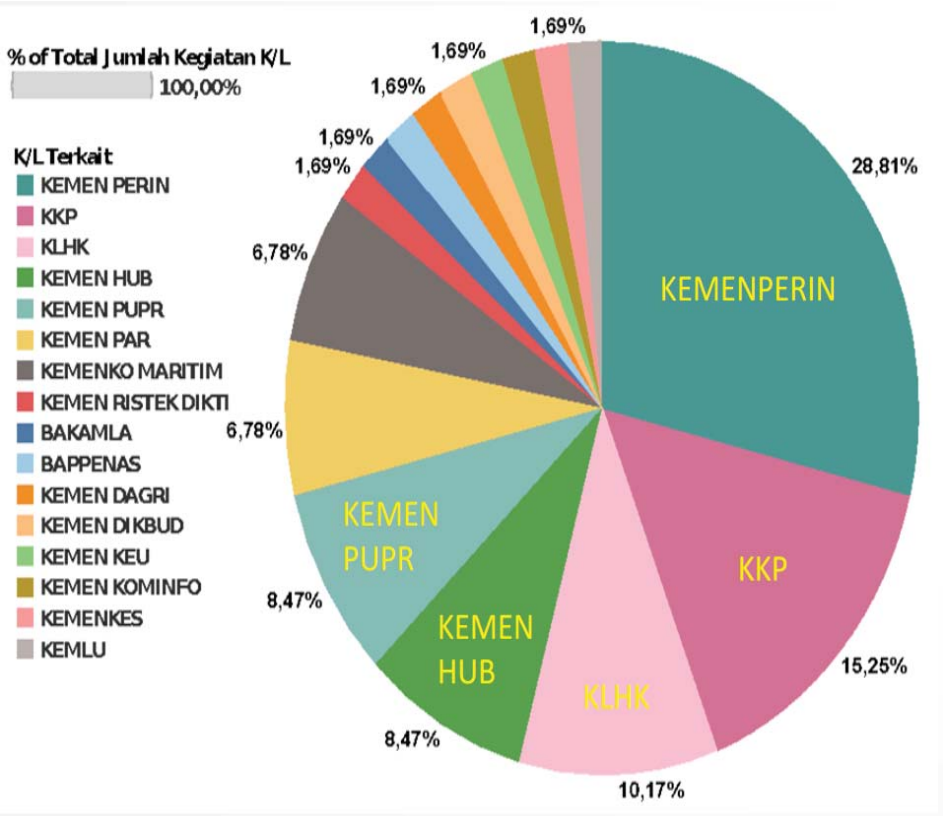


*) Komitmen Presiden Joko Widodo pada acara Leaders Retreat, G20 Summit, Hamburg-Germany, 2017; pada OOC 2018; dan G-20, 2019

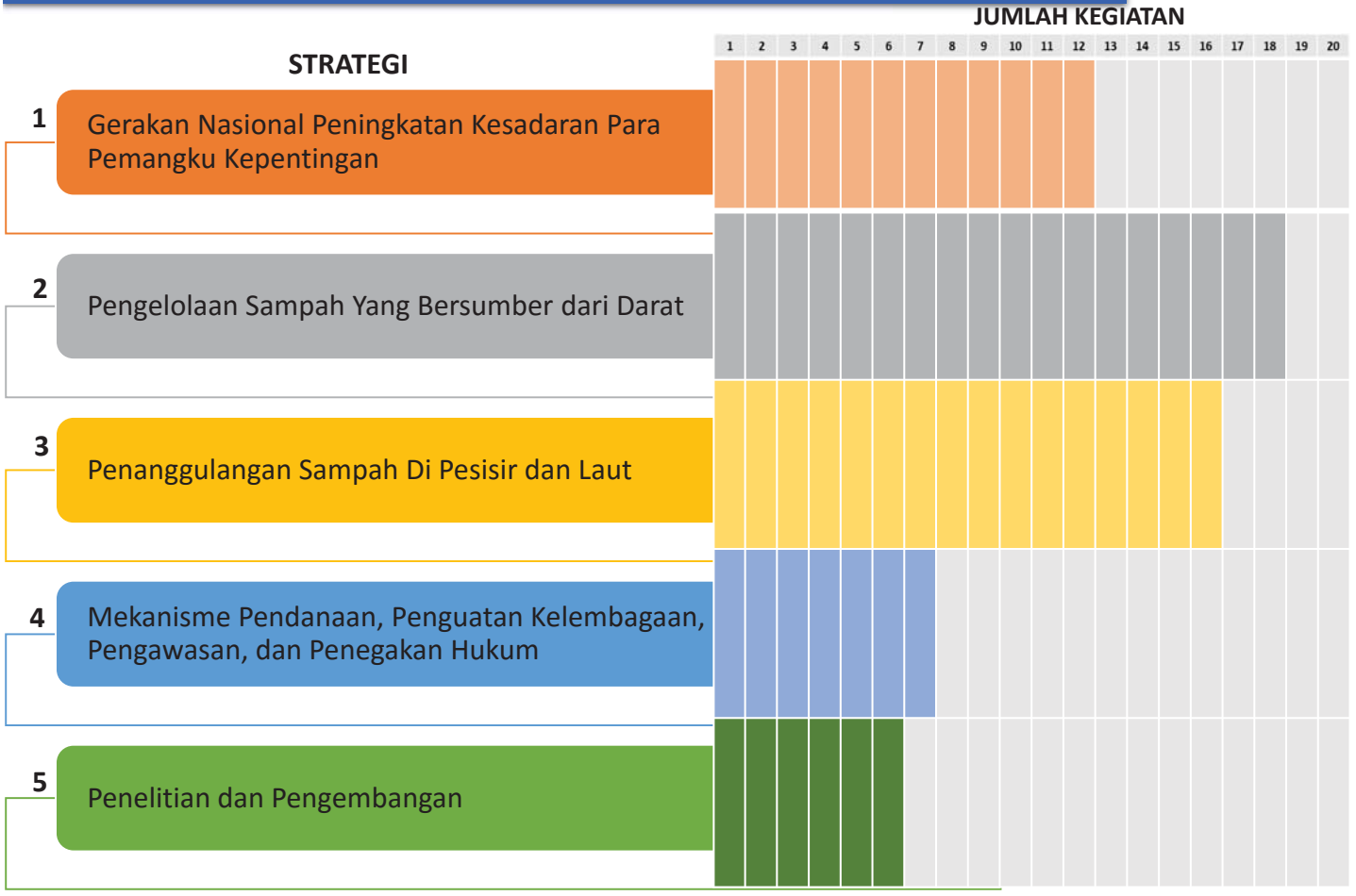
PERATURAN PRESIDEN NOMOR 83 TAHUN 2018 TENTANG PENANGANAN SAMPAH LAUT

- **Terdiri dari 5 Strategi Utama**
- **Terdapat 59 Kegiatan yang melibatkan 16 Kementerian/Lembaga**





PERATURAN PRESIDEN NOMOR 83 TAHUN 2018 TENTANG PENANGANAN SAMPAH LAUT

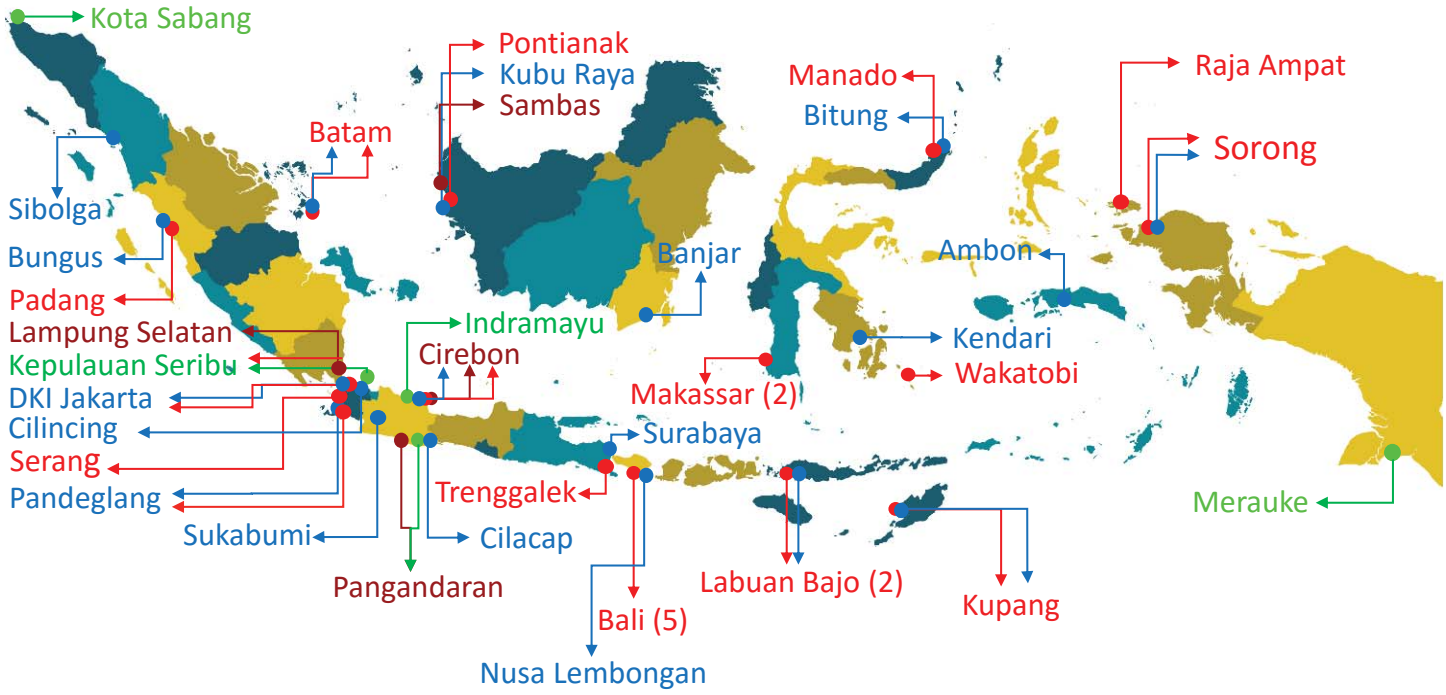


GERAKAN CINTA LAUT

Gita Laut
Gerakan Cinta Laut

1. Gerakan Bersih Pantai dan Laut (GBPL) + Pandu Laut
2. Sekolah Pantai Indonesia (SPI)/Sekolah Bahari
3. Jambore Pesisir dan Penyadartahuan Mitigasi Bencana
4. Pengadaan Alat Pengolah Sampah
5. Aktif dalam Forum dan Kerjasama Internasional

SEBARAN GITA LAUT 2017-2019



- Gerakan Bersih Pantai dan Laut (24 lokasi)
- Sekolah Pantai Indonesia/Sekolah Bahari (5 lokasi)
- Jambore Pesisir (4 lokasi)
- Sarana Pengolah Sampah Pencacah (11 lokasi), Alat Press (3 lokasi), Kompos (6 lokasi)

SEBARAN GITA LAUT 2017-2019


JAMBORE PESISIR (4 LOKASI)



GERAKAN BERSIH PANTAI DAN LAUT (21 LOKASI)



SEKOLAH PANTAI/BAHARI INDONESIA (5 LOKASI)

SEBARAN GITA LAUT 2017-2019




SARANA PENGOLAH SAMPAH (20 Lokasi)

AKTIF DALAM FORUM INTERNASIONAL MARINE DEBRIS SEPERTI APEC, EAS, AMF, CSEAS, UNEP

SEBARAN GITA LAUT 2017-2019

UNDERWATER CLEANUP KEPULAUAN SERIBU 24 – 25 APRIL 2019

GBPL DALAM RANGKA INTERNATIONAL COASTAL CLEANUP, MERTASARI – BALI, 10 MEI 2019

JUMLAH SAMPAH LAUT YANG BERHASIL DIANGKUT MELALUI GBPL 2017 – 2019

NO	LOKASI	PELAKSANAAN KEGIATAN	JUMLAH SAMPAH TERKUMPUL (KG)
1	Labuan Bajo, Kab. Manggarai Barat	29 September 2017	19.000,00
2	Kota Batam, Kepulauan Riau	21 Oktober 2017	555,50
3	Kota Cirebon, Jawa Barat	28 Oktober 2017	4.000,00
4	Kab. Wakatobi, Sulawesi Tenggara	10 November 2017	3.500,00
5	Tanjung Benoa, Badung, Bali	25 November 2017	600,00
6	Pantai Merthasari, Denpasar, Bali	26 November 2017	1.122,00
TOTAL JUMLAH SAMPAH TERKUMPUL 2017			***28.777,50***
NO	**LOKASI**	**PELAKSANAAN KEGIATAN**	**JUMLAH SAMPAH TERKUMPUL (KG)**
1	Pantai Aeng Batu-Batu, Makassar	6 Februari 2018	163,60
2	PPS Nizam Zachman, Jakarta	23 Maret 2018	693,50
3	CFD Jakarta (Launching Pandu Laut Nusantara)	15 Juli 2018	-
4	GBPL lebih dari 73 Lokasi di Indonesia	19 Agustus 2018	360.000,00
5	Pantai Padang Galak, Bali	15 September 2018	841,53
6	Labuan Bajo, Kab. Manggarai Barat	3 Oktober 2018	1.007,54
7	Pantai Kuta, Bali	28 Oktober 2018	366,80
8	Raja Ampat, Papua Barat	6 Desember 2018	1.418,95
9	Manado, Sulawesi Utara	12 Desember 2018	2.058,00
TOTAL JUMLAH SAMPAH TERKUMPUL 2018			***366.549,92***
NO	**LOKASI**	**PELAKSANAAN KEGIATAN**	**JUMLAH SAMPAH TERKUMPUL (KG)**
1	Pantai Prigi, Kab. Trenggalek	5 Februari 2019	616,00
2	Pantai Cerri, Pandeglang	28 Februari 2019	668,00
3	Lampung Selatan	15 Maret 2019	404,20
4	Kepulauan Seribu	24-25 April 2019	69,22
5	Pantai Merthasari, Bali	10 Mei 2019	634,94
6	Pantai Timur, Kelurahan Ancol (dalam rangka GML 2.0)	18 Agustus 2019	7.525,00
7	Underwater Cleanup di Pulau Air dan Pulau Panggang	26 Agustus 2019	10,37
TOTAL JUMLAH SAMPAH TERKUMPUL 2019			***9.523,53***
JUMLAH TOTAL SAMPAH TERKUMPUL PADA GBPL 2017 - 2019			**404.850,95**

GITA LAUT 2019

NO	KEGIATAN	LOKASI		PELAKSANAAN
1	Gerakan Bersih Pantai dan Laut (GBPL)	6 Lokasi	Prigi – Jawa Timur	5 Februari 2019
			Pandeglang - Banten	28 Februari 2019
			Kepulauan Seribu	24-25 April 2019
			Mertasari, Bali	10 Mei 2019
			Pantai Timur, Kelurahan Ancol (dalam rangka GML 2.0)	18 Agustus 2019
			Underwater Cleanup di Pulau Air dan Pulau Panggang	26 Agustus 2019
2	Jambore Pesisir	1 Lokasi	Lampung Selatan	13 – 15 Maret 2019
3	Pelatihan Pengolahan Sampah Plastik	3 Lokasi	Sukabumi	11 April 2019
			Cilincing	31 Juli 2019
			Muara Baru	

GITA LAUT 2019

NO	KEGIATAN	LOKASI		PELAKSANAAN					
4	Sekolah Pantai / Bahari Indonesia	8 Lokasi	Kegiatan	Sosialisasi	Amati 1	Amati 2	Analisis	Ajarkan	Aksi
			Kab. Pesisir Selatan	4 Sept 2019	18 Sept 2019				
			Kab. Meranti	26 Agustus 2019	5 Sept 2019				
			Kab. Belitung Timur	2 Sept 2019	11 Sept 2019				
			Kab. Kep. Seribu	29 Agustus 2019	19 Sept 2019				
			Kab. Serang	31 Agustus 2019	9 Sept 2019				
			Kota Palu	22 Agustus 2019	24 Agustus 2019				
			Kab. Bone	5 Sept 2019	6 Sept 2019				
			Kab. Lombok Utara	25 Agustus 2019	19 Sept 2019				

KONSEP 5-R

RETHINK
perubahan *mindset* masyarakat bahwa laut bukan "keranjang sampah"

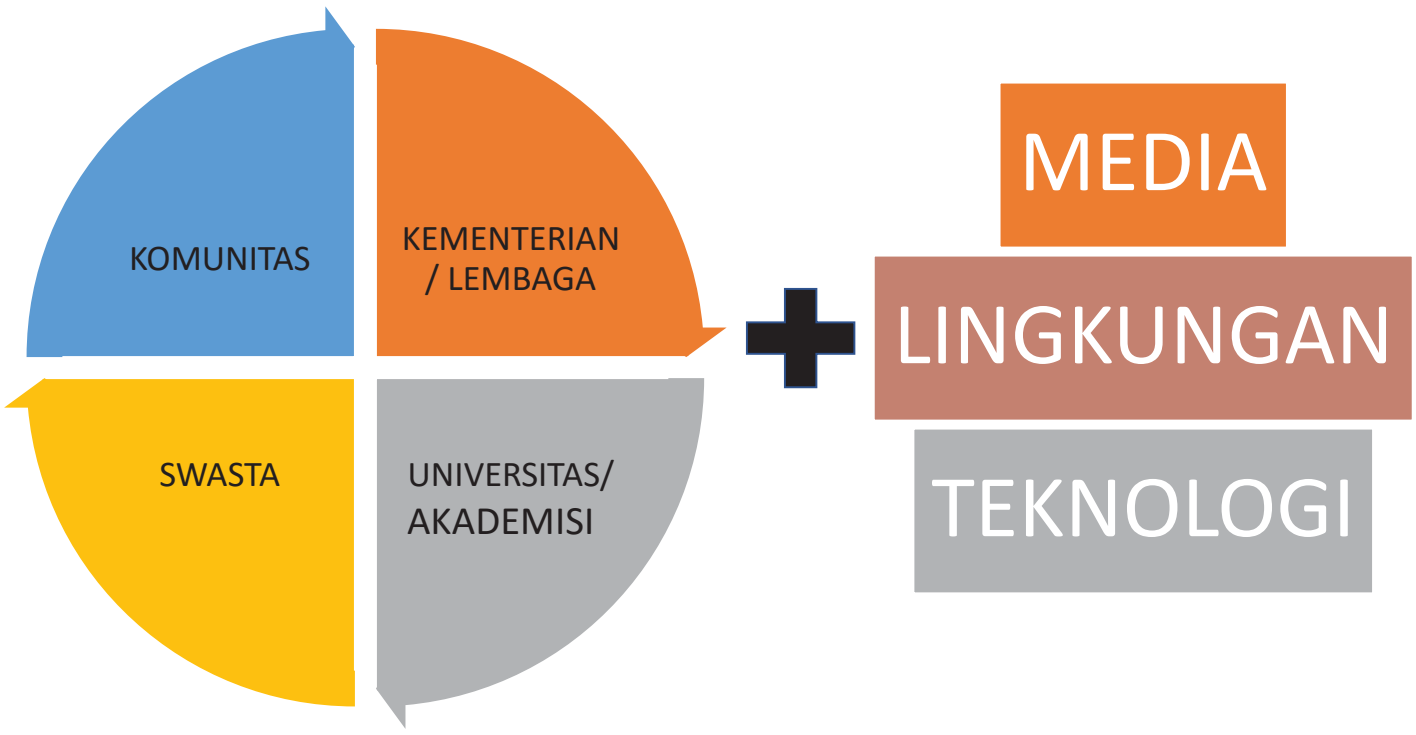
REFUSE
gerakan penghentian dan pencegahan penggunaan produk-produk sekali-pakai

REDUCE
membatasi jumlah penggunaan produk-produk sekali-pakai

REUSE
gunakan ulang

RECYCLE
mendaur ulang materi sampah yang dapat masuk ke laut menjadi produk yang bernilai ekonomis atau menjadi energi.

KEBERHASILAN KETERPADUAN PENANGANAN SAMPAH LAUT



LESS WASTE FOR YOUTH

Terima kasih

Direktorat Pendayagunaan Pesisir dan Pulau-Pulau Kecil
Direktorat Jenderal Pengelolaan Ruang Laut
Gedung Mina Bahari III – Lt. 8
Jl. Medan Merdeka Timur Nomor 16 Jakarta Pusat
Email: subditrestorasikkp@gmail.com

Japan's Effort to Combat Marine Litter – Domestic Measures and International Cooperation

Tsuji Keitaro

JICA Expert on Environmental Policy

Dispatched to Ministry of Environment and Forestry Indonesia – dispatched from Ministry of Environment Japan

1. Japan's Domestic Effort to Tackle Marine Litter

Japan's Resource Circulation Strategy for Plastics

Japan aims to take a lead of domestic treatment and 3Rs in addition to global contributions, facing challenges such as the second highest amount of plastic container and packaging waste per capita and import restrictions in Asian countries.

Key Strategies

Basic Principle: "3Rs + Renewable"

Reduce	➢ Reduce single-use plastics ("pricing" such as mandatory charge on plastic bags etc.) ➢ Promote substitutes for Petroleum based plastics
Recycle	➢ Easy-understanding and effective segregation at source and recycling of plastic ➢ Thorough collection of fishing equipment onshore ➢ Minimize costs and maximize effective use of resources ➢ Develop domestic resource circulation system given embargoes of Asian countries
Recycled materials Bio-plastics	➢ Improve usage potential by technical innovation and infrastructure development ➢ Stimulate demand by green public procurement, and usage incentives etc ➢ Handling of chemical ingredient information ➢ Use bio-plastics such as burnable waste bags ➢ Bio-plastic introduction roadmap and integration with recycling system management

[Target]

<Reduce>

(1) Cumulative reduction of 25% of single-use plastics by 2030

<Reuse/Recycle>

(2) Reusable/recyclable design by 2025

(3) Reuse/recycle 60% of containers and packaging by 2030

(4) 100% effective use of used plastics by 2035

<Recycling and Bio-Plastics>

(5) Double the use of recycled amount by 2030

(6) Introduce 2 million tons of bio-plastics by 2030

Marine Plastic Litter	Aiming for prevention of marine pollution caused by outflow of plastic waste (marine plastic zero emission) ➢ Proper disposal and eliminate littering and illegal dumping ➢ Collection and proper treatment of coastal drift litter ➢ Data collection of marine waste by advanced monitoring methods ➢ Microplastic discharge reduction thorough reduction of microbeads in scrub products by 2020 etc ➢ Promote alternative innovation
International Cooperation	➢ Support emerging countries by tailor-made comprehensive support of soft and hard infrastructure and technology ➢ Develop global monitoring and research network; marine plastic distribution, study ecological impact, standardization of monitoring methods etc
Infrastructure development	➢ Establishment of social systems by soft and hard recycling infrastructure and supply chain structuring ➢ Technology development (renewable resource substitutes, innovative recycling technologies, consumer lifestyle innovation) ➢ Study and research on impact of microplastics, discharge conditions, discharge reduction measures ➢ "Plastics Smart" movement ➢ Promote recycling industries ➢ Information infrastructure (ESG investment, ethical consumption) ➢ Infrastructure for global collaboration

◆ Not only **solve worldwide resource** and **environmental issues,** but also contribute to **economic growth** and **employment creation**
⇒ Contribute to **sustainable development**
◆ **Promote investment and innovation of technology and consumer lifestyle through collaboration with all the stakeholders**

National Action Plan for Marine Plastic Litter

○ **Specified measures to realize a world without additional pollution by plastic litter.**
○ **Focus is to prevent discharge of plastic litter to the oceans.**

Countermeasures

①**Promotion of proper waste management system**

②**Prevention of littering, illegal dumping and unintentional leakage of waste into the oceans**

③**Collection of scattered waste on land**

④**Collection of plastic litter in the oceans**

⑤**Innovation in development of alternative materials**

⑥**Collaboration with stakeholders**

⑦**International cooperation with emerging countries by sharing best practices**

⑧**Research on actual situations and development of scientific knowledge**

Japan's Act on Marine Litter

Act on Promoting the Treatment of Marine Debris Affecting the Conservation of Good Coastal Landscapes and Environments to Protect Natural Beauty and Variety (Law 82 Year 2009)

Government sets up a Promotion Council for Marine Litter Policy

Cooperation under the Council

Ministry of the Environment (secretariat to the Council):
- Is responsible for comprehensive management of marine litter
- Is responsible for waste management and establishing a sound material-cycle society (including promoting recycling systems, etc.)

Ministry of Economy, Trade and Industry
Industrial activities

Ministry of Agriculture, Forestry and Fisheries
Fishery-based litter, trees from mountains

Ministry of Land, Infrastructure, Transport and Tourism
Riverside litter, debris in ports and sea route areas

Japan Meteorological Agency
Research on plastic debris

Japan Coast Guard
Public awareness of marine environment conservation

2. Japan's Collaboration with Other Countries

G20 Energy and Environmental Ministerial Meeting

Date ： June 15-16, 2019

Place ： Karuizawa, Nagano, Japan

Participants：G20 members and guest countries

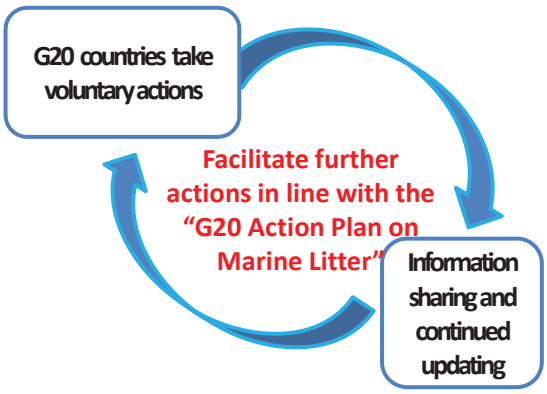
Main Outcomes

- G20 adopted communique and 3 action plans, including G20 Implementation Framework for Actions on Marine Plastic Litter.
- G20 sent out a unified message including climate change issues and agreed on the importance of a concept of “a virtuous cycle of environment and growth in the communique. As for marine plastic issues, G20 members agreed on a new effective framework where each country implements voluntary actions and continues to share actions and best practices among the G20 members.
- These outcomes contribute to G20 Summit discussion in Osaka.

G20 Implementation Framework for Actions on Marine Plastic Litter

1. Facilitation of Effective Implementation of the “G20 Action Plan on Marine Litter”

- Promote a comprehensive life-cycle approach through measures such as (1) **environmentally sound waste management**, (2) **clean-up** of marine plastic litter, (3) deployment of **innovative solutions**, and (4) international cooperation to **enhance national capacities**.
- G20 Countries continue to share and update information on relevant policies, plans and measures, **utilizing opportunities such as the G20 Resource Efficiency Dialogue.**



2. Collaborative actions among the G20 members and outreach activities beyond the G20

- **Sharing scientific information and knowledge**
  (Strengthen scientific foundations to measure and monitor marine litter and their impact)
- **Promotion of international cooperation**
- **Promotion of innovative solutions**
- **Multi-stakeholder involvement and awareness raising**

East Asia Summit Leaders' Statement on Combating Marine Plastic Debris

ASEAN+3 Marine Plastics Debris Cooperative Action Initiative

1.Improving management of plastic waste and 3R

Capacity building of waste management system Sharing knowledge

2.Promoting awareness, research and education on marine plastic debris

- Raising awareness of non-state actors such as local governments, citizens and the business sector
- Developing capacity for implementing monitoring of marine plastics debris, including introduction of harmonized and standardized methods for monitoring micro-plastics in ASEAN countries
- Collection of scientific information about marine plastic debris, such as distribution of marine plastic debris
- Sharing knowledge on good and innovative practices of national and local governmental policies, research and development

3.Enhancing cooperation in policy reform and law enforcement

4.Implementing policies that incentivize the private sector and end-user in reducing and combating marine plastic debris

5.Strengthening regional and international cooperation

- Establishing a regional knowledge hub on marine plastic debris
- Developing capacity to develop national action plans/programs/initiatives to address marine plastic debris.

Regional Knowledge Hub for Marine Plastic Litter

Overview

The Regional Knowledge Hub is a **information clearinghouse** regarding marine plastic in APT countries.

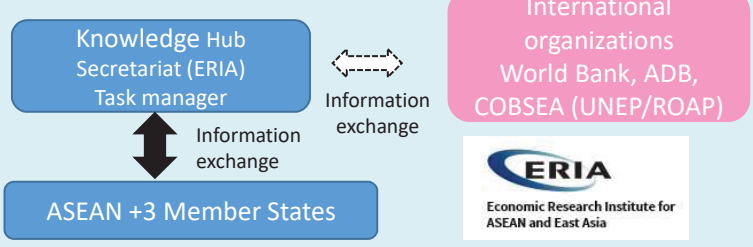
<Purpose>

1. Networking and raising awareness
2. Promoting innovative actions in each county
3. Facilitating national and regional cooperation

Implementation Framework

Secretariat : To be established at **ERIA (Economic Research Institute for ASEAN and East Asia)**

Task manager: To be hired in charge of information collection, communication and coordination among stakeholders



Major Activities

Development of Foundation

Establish **network of relevant organizations**

Collection and Analysis of information

Review and share **good practices and policies**

- Policies and initiatives
- Material flows and monitoring methodologies
- Best practices and innovative solutions

Knowledge Sharing

Develop **website**

Raising Awareness and Capacity Building

Project Outline of JAIF (Japan-ASEAN Integrated Fund) projects

Objectives and Outline of JAIF Projects			Further activities
Objectives	Phase 1 Period : 2019.3 – 2019.9	Phase 2 Period : 2019. – 2021.12	
1. Assist Formulation of National Action Plans	**Develop Template of National Action Plan (NAP)** (1) Reviewing existing marine debris measures in ASEAN Member States (2) Collection and analysis of good practices (ex. Existing NAP of Indonesia) (3) Development template of NAP => input to item 5 WS	**Apply Template of NAP in Target Countries** (1) Assistance for formulation of NAPs (2) Sharing lessons through workshops (3) Development monitoring methods for NAP implementation	Formulation of NAPs by dissemination of outcomes of Phase2 project
2. Develop Supporting Tools for Integrated Land to Sea Policy Approach	**Case Study Research on Generation Amount and Sources of Land Originated Marine Debris (MD)** (1) Reviewing existing study reports and information (2) Investigation of actual condition for indicators (3) Implementation of joint research	**Develop Estimation Tools on Generation Amount and Sources, and MD Measures** (1) Experts Review and Developing Estimation Tools (2) Trial run in target river basin (3) Recommendation for MD reduction measures	Develop Integrated Land to Sea Policy Approach System
3. Support Capacity Building for Solid Waste Management Activities	**Develop Capacity Building Program** (1) Reviewing solid waste management(SWM) activities (3R etc.) and identify basic needs in ASEAN Member States (AMS) (2) Preparation of draft capacity building program	**Pilot Study on Capacity Building Program for Enhancement SWM Activities** (1) Implementation of the capacity building program (2) Preparation of application guidelines in AMS	Dissemination of Phase2 outcomes and enhancement of 3R Activities
4. Develop Marine Debris Monitoring	**Review Monitoring Method inside/outside of ASEAN** (1) Collection of monitoring methods (2) Review of monitoring system in ASEAN region (3) Grasp challenges and countermeasures for development and application of monitoring system	**Development and Trial of Marine Debris Monitoring Plan** (1) Reviewing the monitoring method by the platform (2) Review by Development and trial of monitoring plans	Establishment and Implementation of sustainable monitoring system

Japan-Indonesia : Joint Monitoring Program of Marine Litter

○On June 27, 2019, Yasuo Takahasi (Vice-Minister for Global Environment Affairs, Ministry of Environment Japan) and Safri Burhanuddin (Deputy Minister of Coordinating Ministry of Maritime Affairs) singed to the Implementing Arrangement of the cooperation in the field of the monitoring of marine litter.
○Specifically, a joint monitoring of marine litter around Indonesia and a training course in Japan to develop monitoring methodologies will be implemented from 2019 to 2021.

Outline of the Implementing Arrangement

（1）A Joint Pilot Project to monitor marine litter around Indonesia:

- Select 5 locations in the Java Sea, and conduct a survey on floating litter including microplastics.
- In conducting the survey, dispatch experts from Japan and hold the survey in cooperation with governmental research institution in Indonesia.

（2）A Training Course in Japan for Indonesian participants to develop human resource on the monitoring methodologies for marine litter:

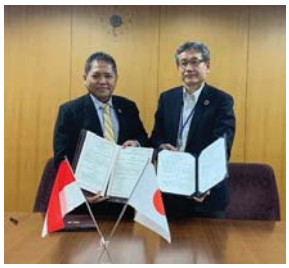
- From FY2019, expand the training programs on the monitoring methodologies for floating litter including microplastis which has been conducted by the Ministry of the Environment since FY2016
- During 2 weeks of the traning program, training will be conducted on sea areas using research vessels of Tokyo University of Marine Science and Technology, etc.
- Invite about 4 trainees from Indonesia

（3）Develop a manual on the monitoring of marine litter based on the findings that gained through the Joint Pilot Project:

- By utilizing the results, develop and publish a manual that summarizes procedures to conduct monitoring of marine litter in Indonesia

Schedule

Aug~Sep, 2019	Training Course in Japan using Japanese vessel
Sep~Oct, 2019	Preparatory research (examine facilities, select research sites, etc.)
FY2020	Conduct the monitoring of marine litter
FY2021	Develop a manual on the monitoring of marine litter



Signature ceremony

Sea area for the joint research

Capacity Development on Pilot Survey of Marine Litter

Current Problem

Lack of survey/efforts to understand the situation in East/Southeast Asia, where many countries emit a lot of plastic litter.

Support establishing survey systems in East/Southeast Asian countries

From FY2016, by conducting a training program for human resource development on marine litter survey utilizing Japan's knowledge of monitoring methodologies, Japan will support establishing a feasible and sustainable survey system, and will lead to policy decisions and evaluation of initiatives based on the result of analysis.

【Contents of Training Course】

○Survey of floating litter (Including microplastics) and seabed litter on sea areas.

○Learning monitoring methodologies for microplastics

【Participants】

Indonesia(4), Vietnam(3), Thai(1), Cambodia(1)　Total: 9 participants

Outcome

○Conducting survey of marine litter by countries participated training course

○Accurate understanding of situation of data blank area and enhancement of scientific knowledge

○Lead to requesting international cooperation for reduction of marine litter through elucidation of sources and routes of marine litter.

Harmonization of monitoring methods (1)

Background

- Marine litter including microplastics is very urgent matter. Measures against marine litter and microplastics need to be considered and taken, based upon scientific knowledge.
- Understanding their actual condition is critically important.
- However, comparison of microplastic amount in each different report is difficult due to diverse monitoring methods.

Require

- **Harmonization** of monitoring methods
- Exploration **how to compare existing data**

Harmonization of monitoring methods (2)

Guideline Contents

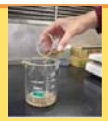
Chapter	Contents
1.Introduction	Background, purpose, scope, etc.
2.Sampling methods	Sea conditions, sampling equipment, tow parameters, recording metadata, implementing blank test.
3.Laboratory analysis	Preprocessing, picking of microplastics, counting and measuring size, material identification, weight measurement and accuracy control during analysis.
4.Reporting	Recommendations on methods of reporting microplastic collection results and metadata to be attached.
5.Conclusions	Summary, items that require further consideration, etc.

Planning
↓
Equipment

↓
Sampling

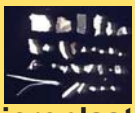
↓
Onboard sample processing

Pretreatment



↓
Picking of microplastics

↓
Counting and size measurement

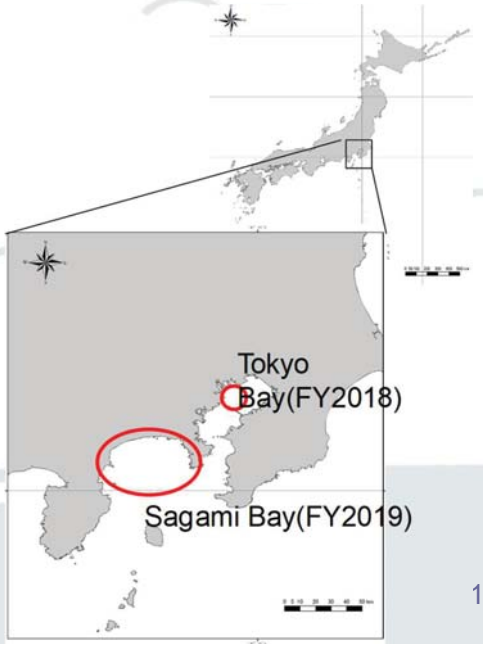


↓
Identification of microplastics
↓
Weight measurement

Harmonization of monitoring methods (3)

Actions underway

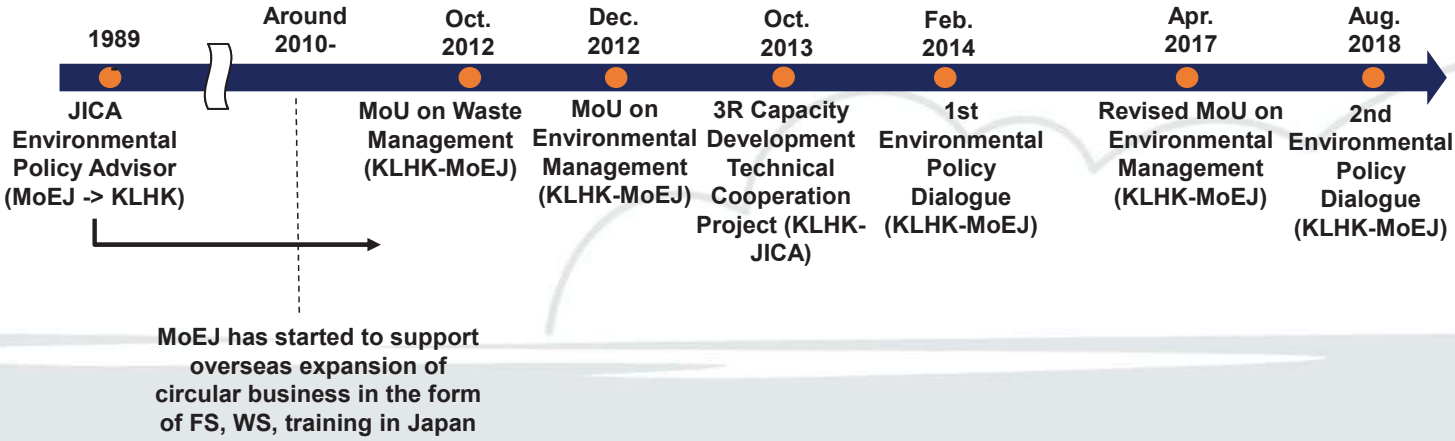
- Field survey is continued in 2019 to provide additional supporting data.
- Microplastic sampling is conducted in Sagami Bay using a **small vessel (fishing boat).**
- Sampling methods to be investigated in FY2019.
  - ・Different **mesh openings**
  - ・Different **types of sampling nets**
  - ・Different **sampling net positions relative to the vessel**
  - ・Different **tow directions relative to the wind**



Indonesia-Japan Cooperation History on Waste Management

Long history as basis of cooperation on Waste Management

- JICA/MoEJ (Ministry of Environment Japan): Environmental Policy Advisor to Ministry of Environment and Forestry (KLHK) (1989-)
- MoEJ: Support overseas business of circular industry (around 2010-)
- MoEJ: MoU with KLHK (2012-)
- MoEJ: Environmental Policy Dialogue with KLHK (2014, 2018)
- JICA: 3R Capacity Development Technical Cooperation Project with KLHK (2013-2017)



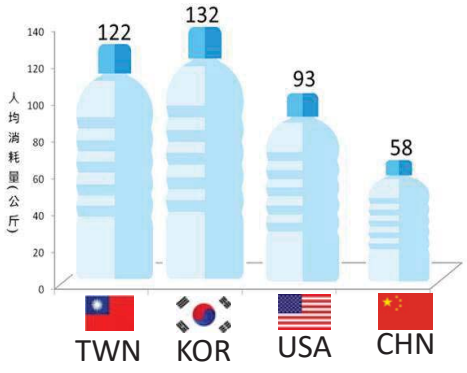
Taiwan's Restrictions on Plastics

Yao-Cheng, Wang
Department of Waste Management, Taiwan EPA

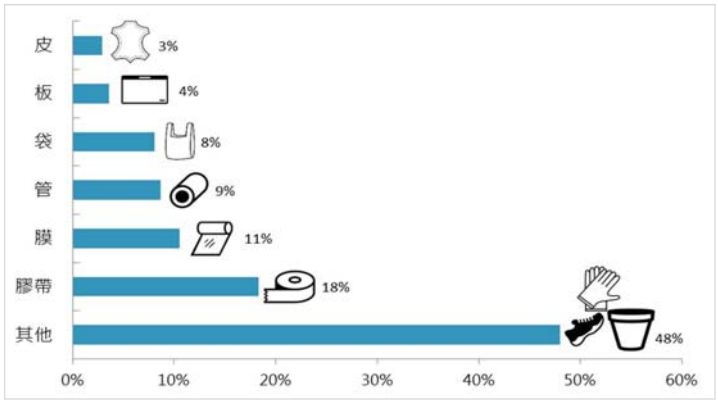
26, Sept. 2019

Statistics for plastic use in Taiwan

- About 12 million tones of plastic resources are imported each year.



Annual plastic consumption= 122 kg per capita



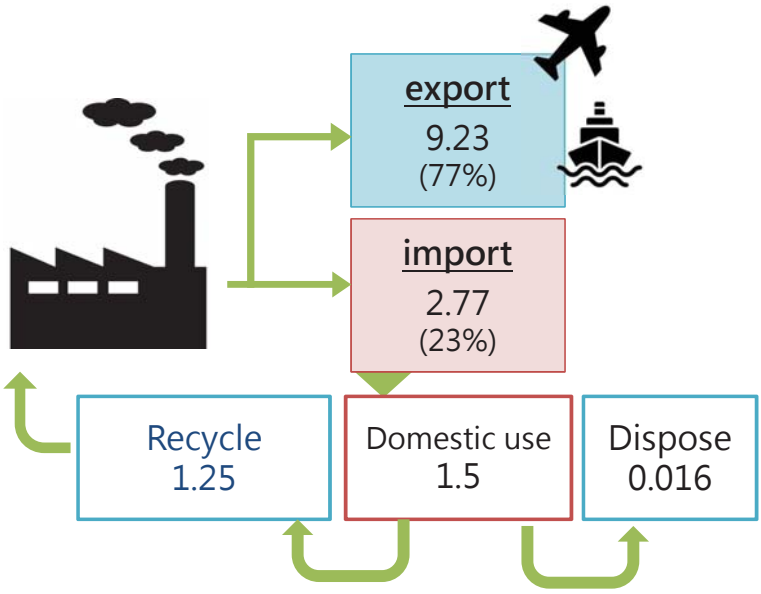
(Data Source : MOEA, TWN)

Flow of plastic resources in Taiwan

Fossil materials	Plastic materials
9.7 (81.65%)	1.26 (10.6%)
Plastic products	**Plastic scraps**
0.46 (3.88%)	0.46 (3.87%)

12 million tones/yr
Import

(Unit：million tones/yr)



(Data source : MOF, MOEA, EPA)

Top Ocean Waste in Taiwan

Plastics pollution

An estimated 8 million tons of plastic waste go into the ocean each year. Currently marine plastic waste is estimated to be 150 million, equivalent to one fifth of the total weight of the fish in the ocean.

Ocean Waste Management

Ocean Waste management platform

Source reduction
- Strengthen regulations and guidelines
- Reinforce EPR
- Enhance education

Prevention and removal
- Remove hotspot wastes
- Prevent leakage into the ocean

Research and investigation
- Monitor and investigate coastal and marine pollution

Collaboration and partnership
- Expand and strengthen multi-party cooperation
- Engage public participation

Plastics Reduction Actions of Taiwan

2002-
limit use of plastic bags; this policy has been continuously reviewed with more limitations

2011 –
vendors to offer discounts to customers who bring reusable cups

2018 –

- **prohibiting the selling of products that contain microbeads**
- **the second stage of limiting the use of plastic bags**

Plastic shopping bags

- ✓ Since 2002, it has been implemented in seven major industries and 20,000 companies. The use of plastic bags has decreased by about 2 billion/year.
- ✓ In 2018, there were 7 new industry control targets, which totaled 14 categories and 100,000 companies. The use of plastic bags decreased by about 4.5 billion/year.

2002 Premises subject to controls
1. Public sector
2. Private schools
3. Department stores and shopping centers
4. Hypermarkets
5. Supermarkets
6. Convenience store chains
7. Fast food chains

+

2018 Newly-added premises
8. Drugstores, cosmetic shops, and pharmacies
9. Medical equipment sellers
10. Appliances & photographic equipment, information and communications equipment retailers
11. Bookstores and stationary retailers
12. Laundries
13. Beverage shops
14. Bakeries

Disposable tableware

- ✓ Implemented in 2002, it manages 8 categories of shop, approximately 100,000 stores in total.
- ✓ Starting from 2006, public sectors and schools are not allowed to provide various material disposable tableware regulations.
- ✓ The number of plastic disposable tableware used for controlled objects was reduced by about 2 billion.

2002 Premises subject to controls	•Public sectors •Private schools •Department stores and shopping centers •Hypermarkets •Supermarkets •Convenience store chains •Fast food chains •Catering establishments with storefronts **Total：** **8 categories of shops approximately 100,000 stores**
2006 Expansion of Restriction	•Public sector sand schools are not allowed to provide various material disposable tableware (includes disposable chopsticks and paper cutlery) regulations.

Single-use takeaway beverage cups

- ✓ Since 2011, it has been implemented and managed by three categories of shops.
- ✓ Stores are encouraged to provide their own beverage cup discounts or recycling incentives. From May 1, 2011 to December 31, 2018, the source reduction plan has been approved, with 500 brands (19,068 stores).
- ✓ The use of beverage cups is about 1.5 billion per year, and the reduction is about 10% after the announcement was made, which is about 150 million per year.

Premises subject to controls: Chain stores — beverage shops | convenience stores | fast food restaurants

Control approach: provide a discount to customers bringing their own beverage cups.

Marine Pollution Control

- Cosmetics and personal care products containing microbeads will be banned in Taiwan :
  1. production and import: January 2018 (US: July 2017)
  2. sales: July 2018 (the same as US and Canada)
- There are 9 countries including Canada, France, Italy, Korea, New Zealand, Sweden, England, US, and Taiwan in the world to ban microbeads.


Facial cleanser


Shower gel


Body scrub


Toothpaste

行政院環境保護署

Restricting the Use of Beverage Plastic Straws

- Annual usage amount - about 3 billion straws
  → Too light and too small to be recycled
- Four targets are prohibited from providing single-use plastic straws for in-store use → Since 2019/07/01

Regulated targets


Public institutions


Schools

Department Stores & Shopping Centers

Fast-Food Chains

Not regulated yet

- PLA straws (Green mark needed)
- Products with straws

Alternatives


Just Take it to your mouth


PLA


Bamboo


paper


Stainless Steel


Silicone

...

行政院環境保護署


From July 1, 2019, in-store use
No single-use plastic straws
Four major regulatory objects
Public sector
Schools
Department stores and shopping malls
Fast food chains
Drinking directly is the best
Alternative
drinking directly, paper straws, stainless steel straws, etc.
Environmental Protection Administration Executive Yuan R.O.C. (Taiwan)


108.7.1起
內用不得提供
一次用塑膠吸管
4大管制對象 ●政府部門 ●學校 ●百貨公司及購物中心 ●連鎖速食店
替代方式 直接喝、紙吸管、不鏽鋼吸管等
行政院環境保護署

13

14

Promoting the plastic container recycle rate

- Subsidization for the setup of recycling stations in the villages and harbor.

Recycling facilities


Recycling Station in the community

Recycling Station in the community

Case Study

O'right Company

- Green design Products

The material of the shampoo bottle is **100%** made from recycled milk bottles

The first recycled dispenser head in the world

行政院環境保護署

Case Study

Da Fon Environmental Technology Co., Ltd.


Waste


Regenerated grains


Products

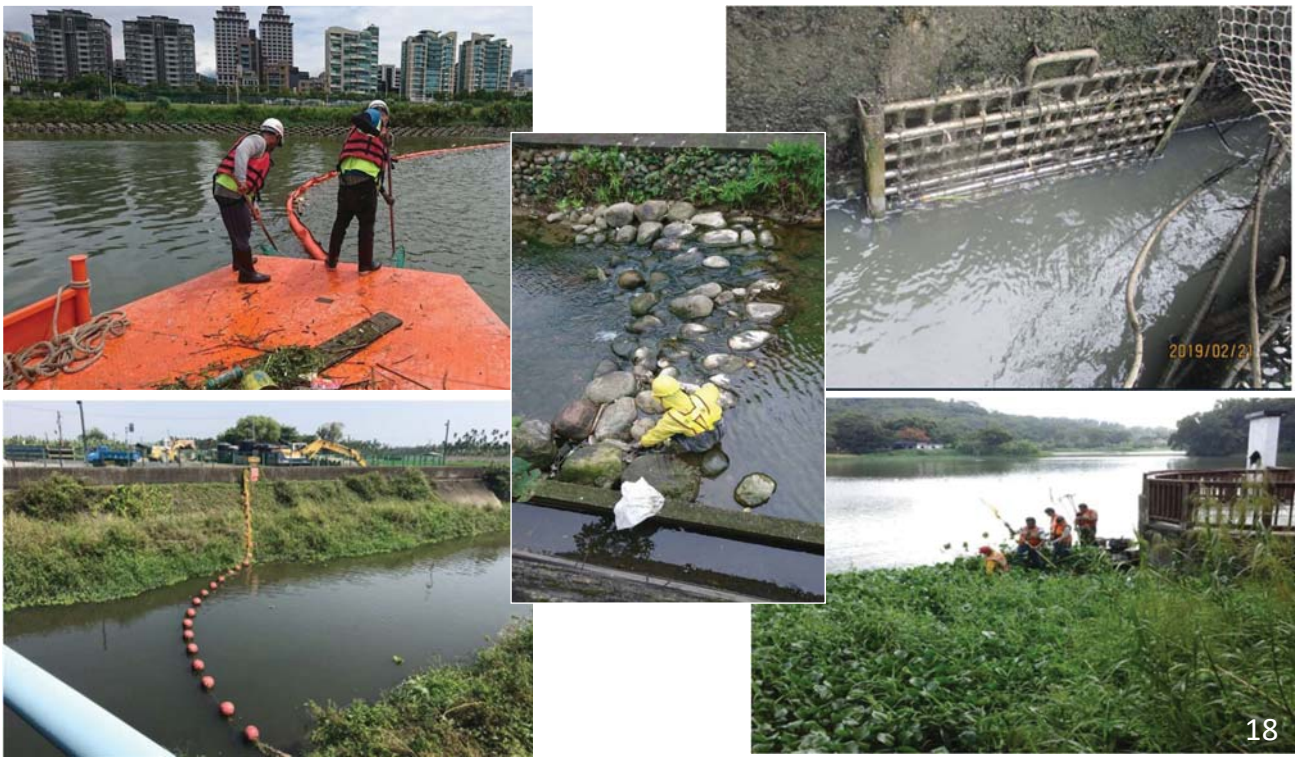
Standard Test Method	Item	Unit
ASTM D1238	Melting Index	g/10min
	Density	g/cm3
ASTM D638	Tensile Yield Strength	Kgf/cm²
	Tensile Break Strength	Kgf/cm²
	Tensile Break Elongation	%
ASTM D790	Flexural Strength	Kgf/cm²
	Flexural Modulus	Kgf/cm²
ASTM D256	Izod Impact	J/M
	Hardness Shore	HDD
	Moisture	%
IEC 62321	Pb、Cd、Hg、Cr、Br	ppm

行政院環境保護署 Environmental Protection Administration Executive Yuan, R.O.C. (Taiwan)

大豐環保

Intercept the waste from the river

- We have collected 130,000 tons of waste in 2019.



Beach Cleanup

Conclusion

- Comprehensive plastic waste recycling and treatment systems
- Promoting circular economy of plastics. Making recycling plastic generate economic values.
- Reducing the use of single-use plastic products from the sources (plastic bags, disposable tableware and straws are commonly found in the marine waste)
- Promoting environmental education. Raising the awareness of environmental protection of the general public. Joint participation in actions of plastic reduction
- Leveraging innovative technologies. Proactively seeking alternative material to plastics.

Thank You


行政院環境保護署
Environmental Protection Administration
Executive Yuan, R.O.C. (Taiwan)

COORDINATING MINISTRY FOR
ECONOMIC AFFAIRS (CMEA)

Circular Economy: Towards an Implementation.

Eddy Satriya
Deputy Assistant for ICT and Utility

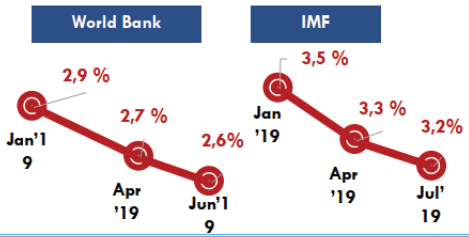
Presented on "Seminar Series 2019: Marine Plastic Litter and Circular Economy"

Jakarta, September 26, 2019

Uncertain Global Economy

The global economy is still influenced by the policies and economic conditions of the US, Euro Area and China. Financial markets are affected by US monetary policy while commodity markets are affected by declining production in industrialized countries. The trade sector was also pressured by the escalation of tension in US relations with big economies like China and India.

PEMANGKASAN PERTUMBUHAN EKONOMI GLOBAL 2019

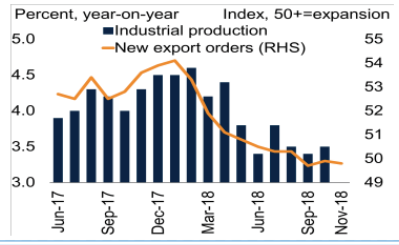


MENURUNNYA GLOBAL TRADE VOLUME GROWTH

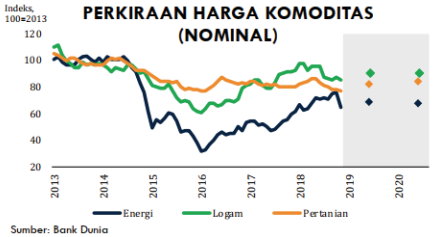
Trade Volume	2017	2018	2019	2020
World	5,5	3,7	2,5	3,7
Advances Economies	4,4	3,1	2,2	3,1
Emerging Market & Developing Economies	7,4	4,7	2,9	4,8

Sumber: WEO IMF, Juli 2019

PRODUKSI DAN PERMINTAAN EKSPOR BARU DALAM INDUSTRI GLOBAL



PERKIRAAN HARGA KOMODITAS (NOMINAL)



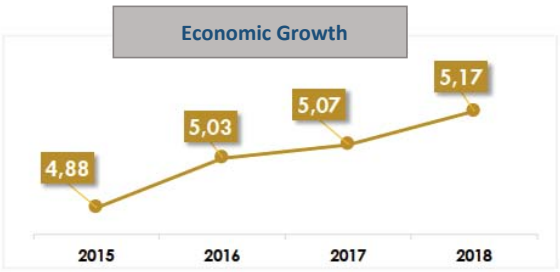
SUMBER KETIDAKPASTIAN GLOBAL

1. Geopolitik dan ketidakpastian kebijakan (Brexit)
2. Moderasi pertumbuhan pertumbuhan Kawasan Euro dan Tiongkok
3. Konflik Perdagangan AS-Tiongkok
4. Normalisasi Kebijakan Moneter AS

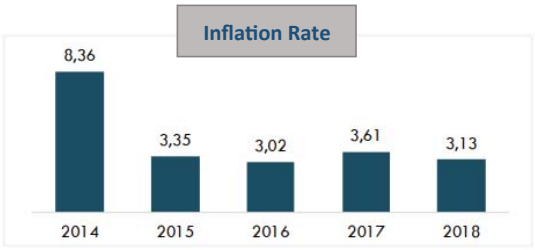
Source: CMEA, 2019

Improving on Domestic Economic Growth

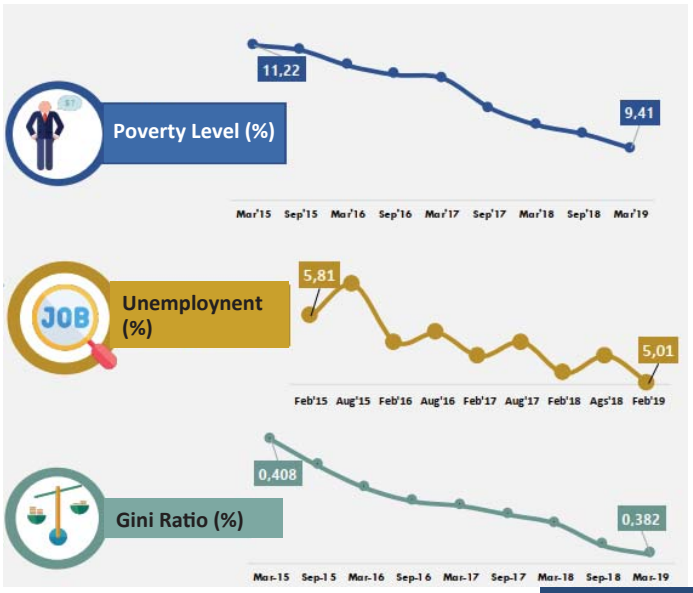
1 Economic Growth Shows A Positive Trend



2 Managable Inflation



3 Better Growth Quality, Marked With Decrease Of Poverty Levels, Unemployment Levels And The Ratio Of The Gini



Source: CMEA, 2019

Government Has Been Doing... The Latest


General Infrastructures


Making Indonesia 4.0


Smart City


e-Government


Palapa Ring


e-Commerce


Special Economic Zone


On Line Single Submission (OSS)


National Strategy For Financial Inclusion (SNKI)


One Data Indonesia


One Map Indonesia


Waste to Energy

Source: Deputy Assistant for ICT and Utility, 2019

Some Definitions of Circular Economy

CIRCULAR ECONOMY

… is a regenerative system in which resource input and waste, emission, and energy leakage are minimized by slowing, closing, and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling.[1] This is contrast to a linear economy which is a 'take, make, dispose' model of production. *(Wikipedia, 2017)*

… is a continuous positive development cycle that preserves and enhances natural capital, optimizes resource yields, and minimizes system risks by managing finite stocks and renewable flows. It works effectively at every scale. (Ellen Mac Arthur Foundation, 2017)

… is an alternative to a traditional linear economy (make, use, dispose) in which we keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each service life. (http://www.wrap.org.uk)

Source: Satriya, 2017

Currently Circular Economy (CE) has started in many countries as a managed waste management solution

Economic Aspects

For developing countries, waste is "money". Because it still contains materials or components that can reproduce (valuable).

Environmental Aspects

Sustaining a healthy environment and provide comfort to the public is the most important.

Social Aspects

CE implementation will encourage public participation in waste management because it will be able to directly see and feel how the resources are optimized in economic activity.

Optimizing the technological change (i) components in our **national production function** as the way to have maximum role of circular economy.

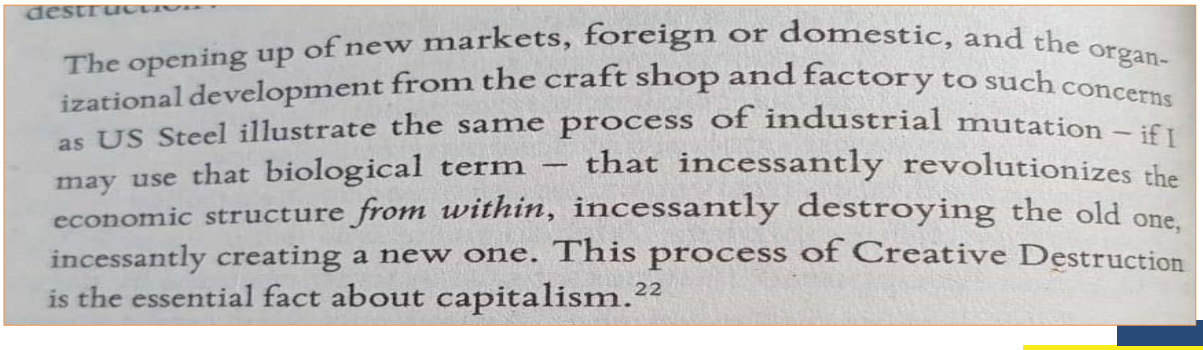
$$Y = f(K, L, i)$$

(i = innovation and technological change index)

Source: Satriya, 2017

Joseph Schumpeter on Innovation (Revisited)

1. **Innovation is the engine of economic growth – "Perenial Gale of Creative Destruction"**
2. **"Creative Destruction is the essential fact about Capitalism"**
3. **Five (5) types of innovation from entrepreneurship:**
   - **The introduction of new good or of new version of a good (better);**
   - **The introduction of a new method of production;**
   - **The opening of new market;**
   - **The conquest of new source of raw materials or half manufactured goods;**
   - **The creation of a new organization of any industry (monopoly, competition);**



destruction.

The opening up of new markets, foreign or domestic, and the organizational development from the craft shop and factory to such concerns as US Steel illustrate the same process of industrial mutation – if I may use that biological term – that incessantly revolutionizes the economic structure *from within*, incessantly destroying the old one, incessantly creating a new one. This process of Creative Destruction is the essential fact about capitalism.[22]

Circular Economy in Indonesia

Indonesia is still in the early stages of introducing CE concepts, definitions, urgency and principles.

In general, both in terms of infrastructure, policy and stakeholder participation, it is still in the preliminary stage, so it takes a common perception, vision and mission, and action plans related to the future circular economy.

A high commitment is needed towards a synergistic vision and mission between stakeholders and competent leaders, to ensure the implementation of CE in Indonesia can run and be sustainable.

At present, only limited cities that can perform the circular economy, namely Surabaya and Jakarta. Therefore, expectations of the future, private parties are encouraged to contribute in waste management and processing.

Source Photo: https://www.bfm.my/podcast/morning-run/the-breakfast-grille/bg-the-circular-economy-going-round-in-circles-but-going-

Principles of Circular Economy

1 Design Out Waste and Pollution

A circular economy reveals and designs out the negative impacts of economic activity that cause damage to human health and natural systems. This includes the release of greenhouse gases and hazardous substances, the pollution of air, land, and water, as well as structural waste such as traffic congestion.

2 Keep Products and Materials in Use

A circular economy favours activities that preserve value in the form of energy, labour, and materials. This means designing for durability, reuse, remanufacturing, and recycling to keep products, components, and materials circulating in the economy. Circular systems make effective use of bio-based materials by encouraging many different uses for them as they cycle between the economy and natural systems.

3 Regenerate Natural Systems

A circular economy avoids the use of non-renewable resources and preserves or enhances renewable ones, for instance by returning valuable nutrients to the soil to support regeneration, or using renewable energy as opposed to relying on fossil fuels.

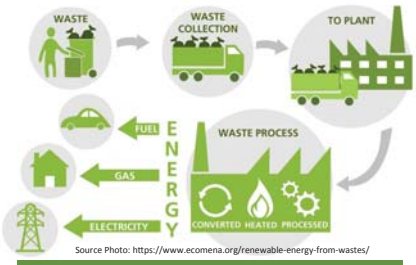
Source: Ellen Mac Arthur Foundation, 2017.

Technology Intervention (Some Examples)

Source Photo: https://www.indiatimes.com/news/india/every-indian-city-needs-to-learn-from-juscos-plastic-roads-in-jamshedpur-232246.html

Plastic Tar Road

- Process low value plastics into a mixed asphalt road.
- Increasing strength perforate and cheaper.
- Target: 77 location (700 km road), reuse 2100 ton plastic bag waste.



Source Photo: https://www.ecomena.org/renewable-energy-from-wastes/

Waste to Energy

- Destroyed garbage in large amount without causing pollution.
- Produce the electricity from waste burning.
- Target: 12 cities (i.e. Jakarta, Bandung, Solo, Denpasar).

Plastic to Fuel

- Process low value plastics into fuel.
- Target: 2 cities. Process 100.000 ton plastic waste/ year.

Source: Coordinating Ministry for Maritime Affairs, 2019

Shifting Paradigm
(Law No. 18/2008 and Government Regulation No. 81/2012)

END OF PIPE SOLUTION

- WASTE JUST POLLUTANT LOADS
- NO WASTE REDUCTION
- NO WASTE TO RESOURCE
- NO RESOURCE EFFICIENCY
- FULL VIRGIN RESOURCE EXTRACTION
- LINIER ECONOMY

3R & EPR

- REDUCE WASTE AS POLLUTANT LOADS
- REDUCTION AT SOURCE
- WASTE TO RESOURCE
- RESOURCE EFFICIENCY
- LIMIT VIRGIN RESOURCE EXTRACTION
- PRODUCER RESPONSIBILITY

CIRCULAR ECONOMY

- MAKE WASTE A NEW LIFE AS LONG AS POSSIBLE
- SUSTAINABLE CITIES AND COMMUNITIES (SDG GOAL NO 11)
- RESPONSIBLE CONSUMPTION AND PRODUCTION (SDG GOAL NO 12)

SOLID WASTE MANAGEMENT NATIONAL POLICY AND STRATEGY TARGET 2017–2025

Indicator	2017	2018	2019	2020	2021	2022	2023	2024	2025
Waste generation projection (mil tons)	65.8	66.5	67.1	67.8	68.5	69.2	69.9	70.6	70.8
Waste reduction target (mil tons)	9.80 (15%	12 (18%)	13.4 (20%)	14 (22%)	16.4 (24%)	17.99 (26%)	18.9 (27%)	19.7 (28%)	20.9 (30%)
Waste handling target (mil tons)	47.3 (72%)	48.5 (73%)	50.3 (75%)	50.8 (75%)	50.7 (74%)	50.5 (73%)	50.3 (72%)	50.1 (71%)	49.9 (70%)

Source: Dhewanthi, 2018

Almost all landfill in every city in Indonesia is overload

UU no. 18 of 2008, Article 44 paragraph 2 :
Within no later than 5 years since the Act was issued (2013), open dumping landfills must have been CLOSED and replaced by better / environmentally friendly landfills, such as controlled and sanitary landfills

After 10 years have passed since Law 18/2008 on Waste Management was established, there has not been any decisive action against the City / Regency that still runs open dumping

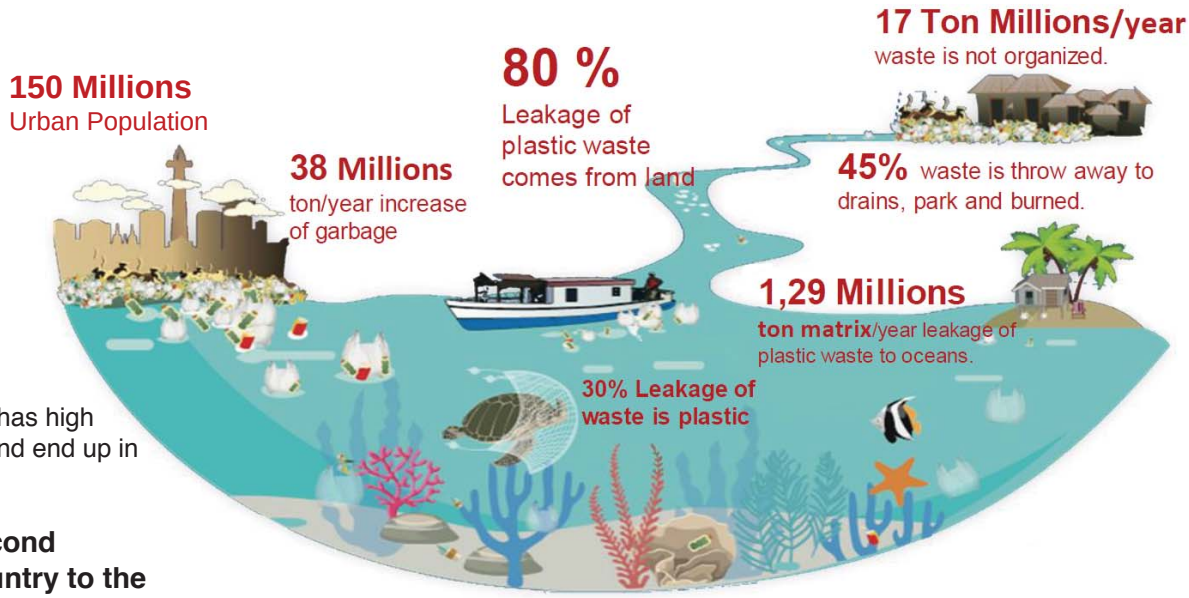
Most of the landfills are still open dumping (98%)

Low of public awareness

Limited Budget

Solid Waste Handling 34,9 % (Riskesdas, 2018). Much garbage is dumped in water body.

Land-Based Leakage of Plastics into Indonesia's Marine Environments



Source: World Bank, 2017 (Processed Data, 2019)

The unmanaged waste has high potential to go to river and end up in the sea.

Indonesia is the second biggest polluter country to the sea.

Source: Jambeck, 2015.

Government of Indonesia has a Commitment to Reduce Marine Plastic Litter

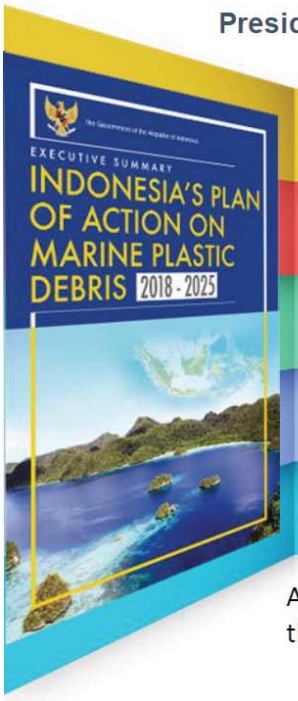
"Indonesia will reduce the volume of garbage by up to 30 percent in 2025 through a reduce-reuse-recycle scheme and has set itself the target of slashing marine plastic debris by up to 70 percent in 2025" – At the Leaders Retreat, G20 Summit, Hamburg-Germany, July 7, 2017.

Statement of National Action Plan for Marine Plastic Debris (2017 – 2025) in June 017. Next step:

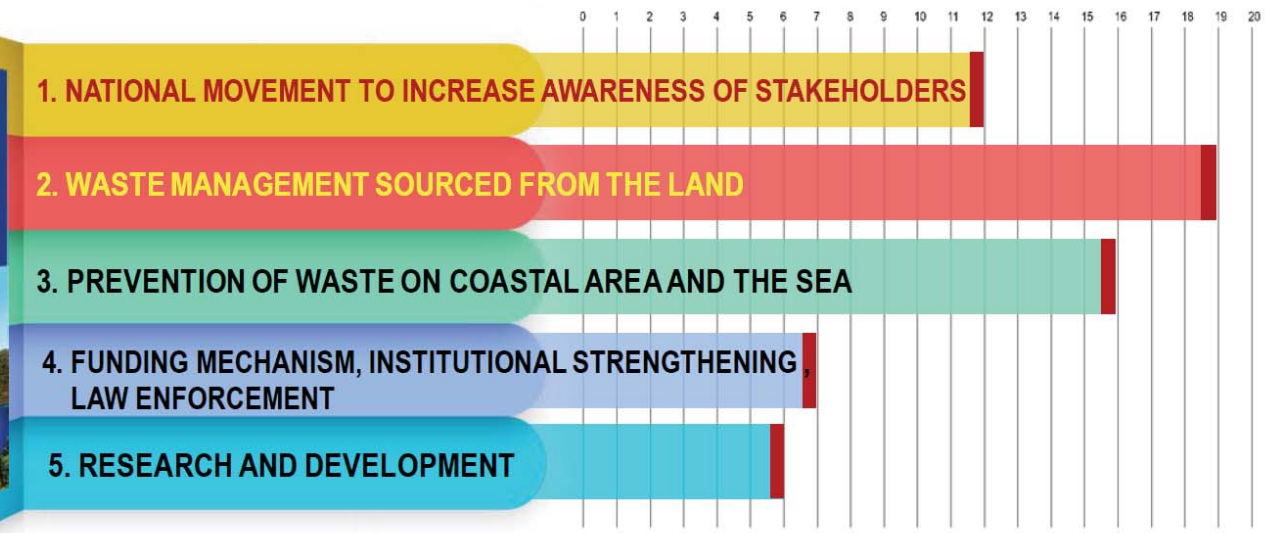
- Presidential Regulation by Coordinating Minister for Maritime Affairs;
- Upstream – downstream Waste Management by Minister of Environment and Forestry
- Revitalization of Solid Waste Management by Minister of Public Works and Public Housing
- Marine Debris Handling Campaign by Minister of Maritime Affairs and Fisheries

Source: Coordinating Ministry for Maritime Affairs, 2019

Indonesia's Plan of Action on Marine Plastic Debris



Presidential Decree no.83 / 2018, Combating Marine Debris



Achieving the target of plastic waste reduction at sea is implemented in an integrated manner through the program in 16 Ministries and Institutions with 59 activities supporting the above 5 Strategies

Source: Coordinating Ministry for Maritime Affairs, 2019

What do WE NEED TO DO?

Source photo: https://corporate.target.com/article/2011/09/reduce-reuse-recycle
Source photo: https://dribbble.com/shots/4503430-Reduce-Reuse-Recycle-Earth-Day

To accelerate the development of Waste to Energy Projects in Indonesia, Indonesian Government have determined the tipping fee and formula for electricity tariff in the latest Presidential Reg. on Acceleration of Waste-to-Energy Projects (Presidential Decree 35/2018)

ARTICLE 15 ON TIPPING FEE SUBSIDY

Pasal 15

(1) Pendanaan yang bersumber dari Anggaran dan Pendapatan Belanja Negara sebagaimana dimaksud dalam Pasal 14 digunakan untuk bantuan Biaya Layanan Pengolahan Sampah kepada Pemerintah Daerah.

(2) Besarnya bantuan Biaya Layanan Pengolahan Sampah sebagaimana dimaksud pada ayat (1) paling tinggi Rp500.000,00 (lima ratus ribu rupiah) per ton Sampah.

(3) Alokasi anggaran untuk bantuan Biaya Layanan Pengolahan Sampah sebagaimana dimaksud pada ayat (2) diusulkan oleh Menteri Lingkungan Hidup dan Kehutanan kepada Menteri Keuangan sesuai dengan ketentuan peraturan perundang-undangan.

BAB VII ...

1. The maximum value of ***tipping*** **fee subsidy is Rp 500,000/ton.**
2. Minister of Environment and Forestry will propose to Minister of Finance regarding the amount of tipping fee subsidy.

ARTICLE 11 ON ELECTRICITY TARIFF

Pasal 11

(1) Harga pembelian tenaga listrik oleh PT PLN (Persero) sebagaimana dimaksud dalam Pasal 10 ayat (3) huruf b ditetapkan berdasarkan besaran kapasitas PLTSa yang dijual kepada PT PLN (Persero) dengan ketentuan:

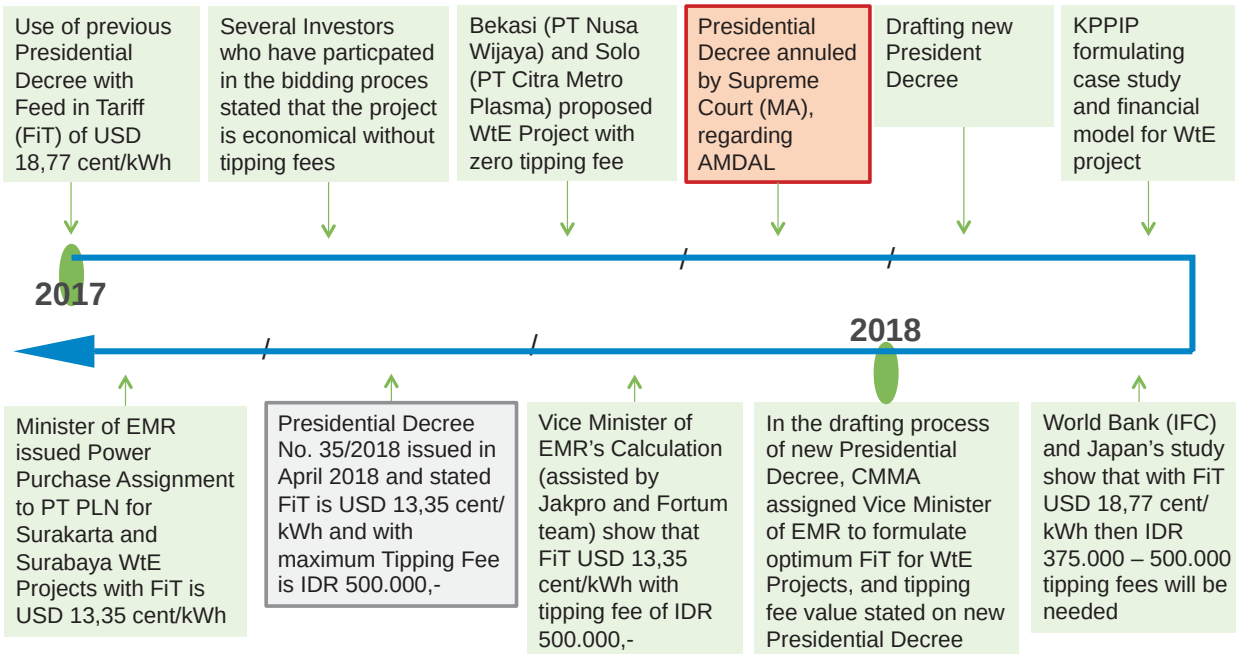
a. untuk besaran kapasitas sampai dengan 20 MW (dua puluh megawatt) sebesar USD 13.35 cent/kWh yang terinterkoneksi pada jaringan tegangan tinggi, jaringan tegangan menengah, atau jaringan tegangan rendah; atau

b. untuk besaran kapasitas lebih dari 20 MW (dua puluh megawatt) yang terinterkoneksi pada jaringan tegangan tinggi atau jaringan tegangan menengah dengan perhitungan sebagai berikut:
Harga Pembelian (USD cent/kWh) = 14,54 – (0,076 x besaran kapasitas PLTSa yang dijual ke PT PLN (Persero)).

1. Based on the formula, the electricity tariff for capacity ≤20 MW will be **US$ 13.35 cent/kWh**.
2. For capacity above >20 MW based on the formula below: 14.54 – [0.076 x capacity]

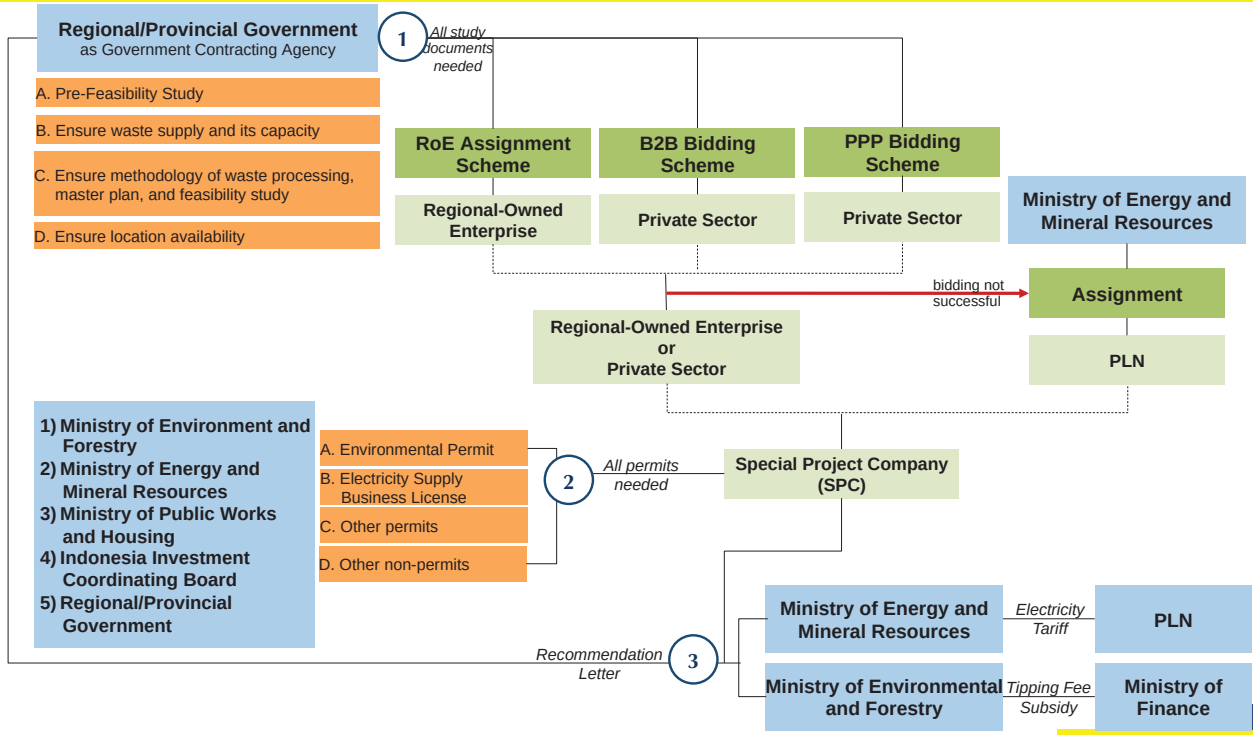
Source: KPPIP, 2019

Chronology of WtE



Source: KPPIP, 2019

Business Process **of WtE (**Presidential Decree 35/2018)



Source: KPPIP, 2019

Waste to Energy (WtE) Projects (1/2)

Target Schedule for the Implementation of the WtE Project with the Independent Tender Process and BUMD Assignment

PROVINCE/CITY	Developer	MEMR Assignment	Power Purchase Agreement	Funding	Construction
1. Surabaya (9 MW)	PT Sumber Organik	Completed (11 July 2018)	Target September 2019	Obtained	COD December 2019
2. Surakarta (5 MW)	PT Solo Citra Metro Plasma Power	Completed (11 July 2018)	Completed (December 2018)	On going PT SMI	Ground Breaking October 2019
3. DKI Jakarta (35 MW)	PT Jakarta Solusi Lestari	Completed (27 August 2019)	Target September 2019	Obtained	On going (foundation work)
4. Palembang (25 MW)	PT Indo Green Power	Target October 2019	Target November 2019	Target November 2019	Ground Breaking December 2019
5. Tangerang (20 MW)	ROEs partner selection	Target October 2019	Target November 2019	Target November 2019	Ground Breaking December 2019

Source: KPPIP, 2019

Waste to Energy (WtE) Projects (2/2)

Target Schedule for the Implementation of the WtE Project with the PPP Scheme

PROVINCE/CITY	Developer	MEMR Assignment	Power Purchase Agreement	Funding	Construction
6. Bekasi A. 1,5 MW	PT Nusa Wijaya Abadi	Target October 2019	Target November 2019	Target February 2020	On going (individual test)

PPP Scheme	OBC	FBC	Transaction Advisor	Tender Process	MEMR Assignment	PPA	Construction
6. Bekasi B. (20 MW) (PPP Potential)	Target November 2019	Target March 2020	Target April 2020	Target August 2020	Target Sept 2020	Target Oct 2020	Target Des 2020
7. Bali (19,5 MW) (PPP Potential)	Feasibility Study August 2019	Target October 2019	Target October 2019	Target December 2019	Target Jan 2020	Target Feb 2020	Target June 2020
8. West Java (25 MW)	Completed	Target August 2019	Target September 2019	Target January 2020	Target February	Target March 2020	Target June 2020
9. Tangerang Selatan (20 MW)	Completed	Target November 2019	Target December 2019	Target April 2020	Target May 2020	Target June 2020	Target Sept 2020
10. Semarang (15 MW)	Target August 2019	Target December 2019	Target January 2020	Target May 2020	Target June 2020	Target July 2020	Target Oct 2020
11. Makassar (14,58 MW)	Target September2019	Target January 2020	Target February 2020	Target June 2020	Target July 2020	Target August 2020	Target Nov 2020
12. NorthSulawesi (20 MW)	Target October 2019	Target March 2020	Target April 2020	Target August 2020	Target Sept 2020	Target Okt 2020	Target Des 2020

Source: KPPIP, 2019

Acceleration WtE on 12 Cities /Provinces (as of September 2019)

CITY	VOLUME TON/DAY	CAPACITY (MW)	TECHNOLOGY	INVESTATION VALUE [USD Mio]	TIPPING FEE VALUE [IDR]	STATUS [1 Sepotember]]
CONSTRUCTION STAGE						
Surabaya	1,000	2X6	GASIFIKASI	60	300.000	• Developer : PT Sumber Organik + ECOWASTE CHINA • Finalisasi PPA ; sepakat harga listrik 13,35cUSD/kWh • **Konstruksi mencapai 92 % ; COD Q4-2019**
DKI Jakarta (RoE) ITF SUNTER	2.200	35	GRATE COMBUSTION	245 [konstuksi]	600.000	• Developer : JAKPRO + Fortum Finland • Finalisasi PPA , Pendanaan IFC, Bank DKI • **akan bangun 3 instalasi lain secara pararel**
FINANCIAL CLOSE PROCESS STAGE						
Palembang	1,000	20	CFB[	120	300.000	• Developer : PT Indo Green Power +Jinjiang Environment –China • Finalisasi PPA • tetap menggunakan skema BOO, review FS
Bekasi Kapasitas 1,5 MW	30	1,5	CACB [circulating heat combuster boiler]	*unknown*	0 (kompensasi Hak kuasa: 30 thn setelah kosong)	• Developer : PT Nusa Wijaya Abadi, teknologi dalam negeri • Finalisasi PPA • **akan membangun skala 19 MW dan hrs melaksanakan FS 19 MW**
Surakarta	450	Tahap1 : 5 MW Tahap2 : 5 MW	WET PYROLYSIS GASIFIKASI	Tahap1 : 23 Tahap2 : 33	**Tahap1 : 0** **Tahap2 : ~ 400.000**	• Developer : PT SCMP+PT.PP + AHT JERMAN • PPA : 28/12/2018; support finansial dari PT SMI • **Konstruksi tahap1 5 MW 13% ; COD 28 sept 2021**
TENDER PROCESS STAGE						
Bandung (PPP) (West Java Region)	1,820	29	GRATE COMBUSTION	245	477.000 DAERAH 386.000 PUSAT : 91.000	• **FS : PwC dilanjutkan TA oleh JICA.** • proses PDF dan VGF dari Kemenkeu. • Penyiapan tender oleh LKPP ; Tender: PQ : August 2019. • KPBU : BLPS permen LHK P.24/MENLHK/SETJEN/KUM.1/5/2019;
Tangerang (RoE)	2,000	*unknown*	RDF	*unknown*	300.000	• Penugasan BUMD : PT. Tangerang Nusa Global • Proses tender mitra
PREPARATION STAGE						
Semarang (PPP)	900	15-20	GRATE COMBUSTION	120	790.000 [dalam optimasi]	• **FS/OBC : KIAT (*Kemitraan Indonesia Australia Infrastruktur*)** July2019 • market sounding 6 Agustus 2019
Makassar (PPP)	890	14.1	GRATE COMBUSTION	156,9	590.000 (Perlu direview kembali)	• **OBC : KEITI (South Korea Govt)**. Market Sounding August 2019.
Tangerang Selatan (PPP)	800	12	GRATE COMBUSTION	126	570.000	• **OBC : KEITI (Korea Selatan)** • **FBC – TA KEITI (Korea Selatan) dan ADB [Asian Development Bank]**
Manado (Potensi PPP)	625	??	??	??	??	• **Perlu percepatan** • **bantuan dari chna ICBC untuk membuat FS secara unsolicited.**
Denpasar (Sarbagita) (PPP)	1,200	15-20	GRATE COMBUSTION	120	Sesuai FS: 577.000, dalam proses pembahasan DPRD	• PJPK : Pemprov Bali • **FS : Poiry – Finland** telah diserahkan dari PT.IP ke Prov Bali • Seleksi pengembang ; Prov siapkan BLPS
Bekasi Kapasitas 19 MW (PPP)	1800	19	??	??	??	• **Dalam proses pembebasan lahan**

Source: Coordinating Ministry for Maritime Affairs, updated by CMEA, 2019

Remarks

1. Circular economy is a model towards sustainable development (from economic aspects, environmental aspects, and social aspects);
2. Implementation of CE involves shifting paradigm and changing behaviors at all levels of stakeholders;
3. Support for integration and transformation of policy instruments is needed:
4. Must be able to formulate a strategic step towards implementing CE as one of the best contribution to national productivity and competitiveness;
5. Understanding digital and disruptive economy (creative distraction-Schumpeter) and aligning the development of CE with IoT is a necessity.

Eddy Satriya

- 1988 :Graduated from Bandung Institute of Technology (Telecommunication Engineering)
- 1997 :Graduated from University of Connecticut (MA in Economics)
- 1989-90: Program Management Consultancy (PMC-IV) for Telecommunication Development
- 1990-2005: Working in Bappenas (The National Development Planning Agency).
- 1995 : Secretary to Board of Commissioners of PT.Telkomsel
- 1997- present: Visiting Lecturer in University of Indonesia, University of Pelita Harapan, and ITB
- 2002-present : Actively writes various article and column in national papers and magazines.
- **2005 (Dec)-present: Working in Coordinating Ministry for Economics Affairs**
- **2011 - 2014: Head of International Cooperation Division, Secretariat of KP3EI**

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uddaeddy

Recent publications are available on: eddysatriya.wordpress.com


"The longest journey begins with a single step."
Japan has started waste management a century ago.
We should start right now!!!!
THANK YOU...!!
TERIMA KASIH
Foto: Web Paddy Field, NTT, by Iguh

Appendix

WtE Project Profile of DKI Jakarta

Location	Sunter, North Jakarta City, DKI Jakarta
Investment Value	USD 250 Million (ITF Sunter)
Funding Scheme	ROE Assignment (ITF Sunter)
Government Contracting Agency (GCA)	Governor of DKI Jakarta
Construction / COD	2019 / 2022
Waste Volume / Capacity	2.200 tons/day / 35 MW (Rp 600.000/ton)
Latest Status	• ITF Sunter: • ROE Assingment Scheme to PT Jakarta Propertindo and form JV Company with Fortum (Finlandia) named PT Jakarta Solusi Lestari (PT JSL).

Issues	Central Government Support to Accelerate
▪ Governor approval for Tipping Fee	▶ Tipping Fee study by consultants have been completed with the amount of Tipping Fee is Rp.600.000 tons/day. It has been proposed in Raperda No. 3/2013 and approved by DPRD in August 2019
▪ MEMR assignment to PT PLN to purchase electricity from ITF Sunter	▶ Letter of assignment to Purchase Electricity by PLN has been issued by MEMR on August 2019.
▪ Waiting for agreement between PT JSL and PT PLN to finalize the PPA draft	▶ PPA draft will use the format of PT PLN with the following discussion: (i) “take or pay” and take and pay; (ii) carbon credit; and (iii) bankability.

Source: KPPIP, 2019

WtE Project Profile of Suwung/Sarbagita (Bali)

Location	Suwung, Denpasar City, Bali
Investment Value	USD 120 Million
Funding Scheme	PPP Potential
Government Contracting Agency (GCA)	Governor of Bali
Construction / COD	2020 / 2023
Waste Volume / Capacity	1.375 tons/day / 19,5 MW (Rp 679.000/ton)
Latest Status	• Located in Ngurah Rai Conservation Forest • MEMR has issued assignment letter to PLN regarding Suwung WtE Project in October 2017

Issues	Central Government Support to Accelerate
▪ Use of Conservation Forest Area for 20 years concession	▶ Ministry of Environment and Forestry issued agreement letter regarding use of Ngurah Rai Conservation Forest Area for Suwung WtE Project for 20 years concession
▪ Hand over Feasibility Study document by Indonesia Power to Bali Provincial Government	▶ After cancelation of PT Indonesia Power assignment in July 2019, PT Indonesia Power has been completed and handed over Feasibility Study documents to Bali Provincial Government in August 2019.
▪ Change of funding scheme to PPP scheme	▶ Facilitate communication with MoF and International Funders regarding PPP plan for Suwung WtE project.

Source: KPPIP, 2019

WtE Project Profile of West Java (Legok Nangka)

Location	Legok Nangka, Bandung Regency, West Java
Investment Value	USD 245 Million
Funding Scheme	PPP Scheme
Government Contracting Agency (GCA)	Governor of West Java
Construction / COD	2020 / 2023
Waste Volume / Capacity	1.820 tons/day / 29 MW (Rp 468.000/ton)
Latest Status	• In July 2018, Acting Governor of West Java decided that JICA will support LKPP and KPPIP to assist the tender process of Legok Nangka WtE. JICA has started reviewing OBC documents for gap analysis. • In the process of transaction advisor selection by DJPPR (MoF)

Issues	Central Government Support to Accelerate
▪ Asset hand over from Central Government to West Java Provincial Government	▶ Ministry of Public Works and Housing is waiting for Statement Letter from West Java Provincial Government regarding agreement to receive asset hand over from Central Government.
▪ Pre-Qualification process	▶ Needs of Viability Gap Fund (VGF) Agreement from VGF Committee

Source: KPPIP, 2019

Marine Debris Governance in Taiwan：Opportunities and Challenges

Sung, Hsin-Chen
Deputy Director-General Ocean Conservation Administration, Ocean Affairs Council, Taiwan
September 26 2019

Outline

- Governance Platform
- Strategies for Combating MD
- Recycling Network
- Future Outlook and Trends

Governance Platform

- "Marine Debris Governance Platform" was established on 20 July 2017
- "Action Plan of Marine Debris Governance" was announced on 18 Feb. 2018

Source: EPA

Governance Platform

Action Plan of Marine Debris Governance

Key: Educate and increase public participation

Prevention & Removal

- Effectively remove debris from hotspots
- Prevent waste entering oceans

Source Reduction

- Policy
- Corporate responsibility

Research & Survey

- Monitor pollution on coastline and in nearby oceans

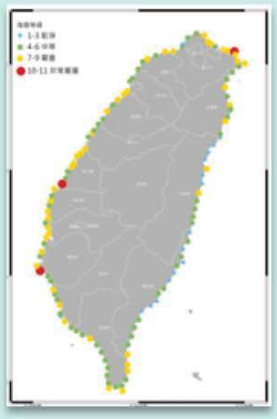
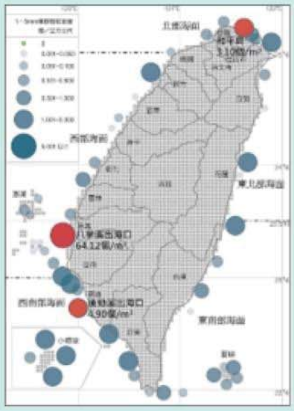
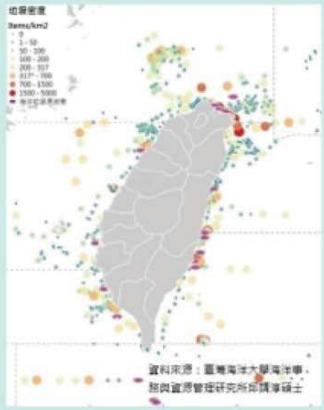
Outreach & Public Participation

- Enhance relationships among multiple stakeholders
- Raise public awareness and attention in society

Partnership ：EPA, OCA, FA, Maritime Bureau, Water Resources Agency and NGOs etc.

Source: EPA

Strategies for Combating MD- Monitoring

Rapid Assessment on Beach	Microplastic	Visual Survey
7 NGOs (GREENPEACE, SOW….)	Kuroshio Ocean Education Foundation	Ching-Chun Chiu (NTOU)
July 2018 to April 2019	May 2018	Dec. 2017 to Dec. 2018
		

- 50% of marine debris accumulates in 10% coastline
- Hotspots：Northern, Southwestern coastal water

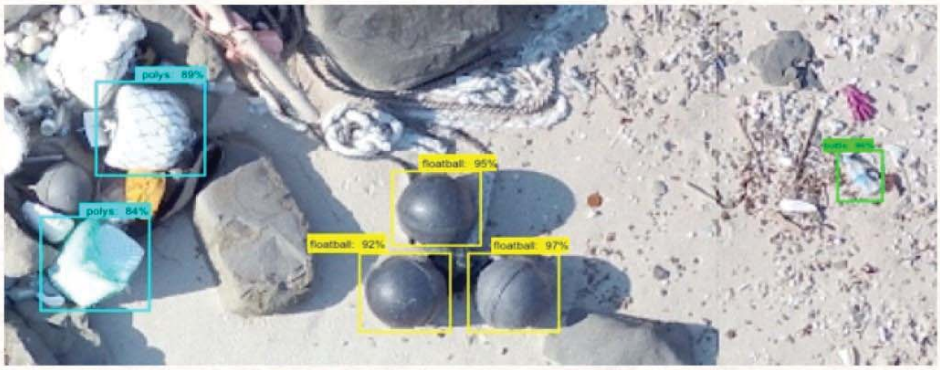
Source: GREENPEACE, SOW, Kuroshio Ocean Education Foundation, Ching-Chun Chiu (NTOU)

Strategies for Combating MD- Monitoring by UAV

- Using Artificial Intelligence (AI) technology to develop marine debris detection model.

Plastic Bottle

Float Ball



Plastic Bottles、Float Balls、Styrofoam were detecting

Styrofoam

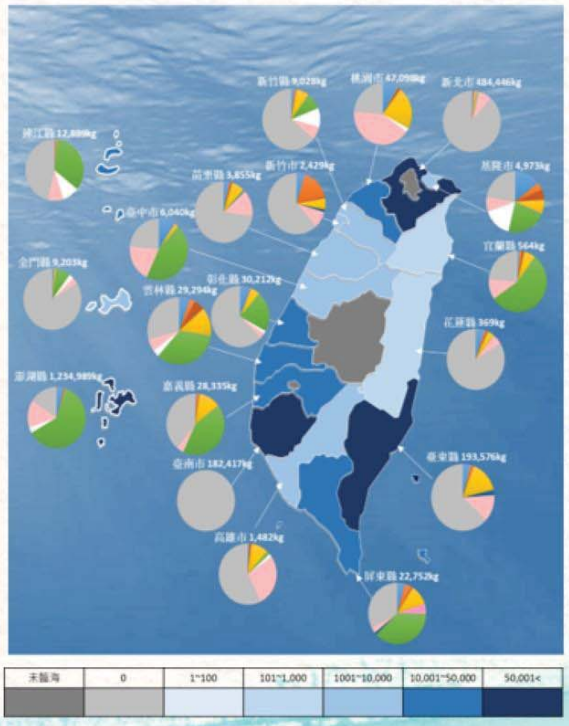
Source: OCA

Strategies for Combating MD -Marine Debris Map

◆Period: From January to June 2019

- ◆Removed by Local government、NGO、Community
- ◆Clean up marine debris on beaches, sea surfaces and seabeds, over 2,469 Tons
- ◆Hotspots：In conformity with rapid assessment on beach and microplastics survey by NGOs

PET bottle	3.11%
Tin can	0.45%
Aluminum can	0.45%
Glass	2.64%
Paper	0.24%
Wood	33.4%
Styrofoam	2.22%
Fishing net and gear	11.11%
Others	46.36%



Source: OCA

Strategies for Combating MD-Strengthen the management of fishing gear

Labelling Fishing Gear

- ◆Labelling Ship name on float
- ◆Regulation：Implemented in Keelung(2017) and New Taipei(2019)

Management in Oyster Farming

- ◆Regulation：Registration, Recycling, Packaged Styrofoam
- ◆Alternatives：Research, Development, Encourage

PE	EPP	HDPE
		

Source: Local government(Keelung, New Taipei, Tainan)、TVBS NEWS

Strategies for Combating MD- Established the EPFs

- The first environmental protection fleet(EPF) was established in Penghu County at the summer of 2016
- Now from all 19 coastal seafront cities and counties have their own fleet, 2,164 fishing vessels on 31 July 2019 totally.
- Recycling redemption reward program has been introduced to encourage the recruitment of the fleets
- Combination with local fishermen's religious ritual

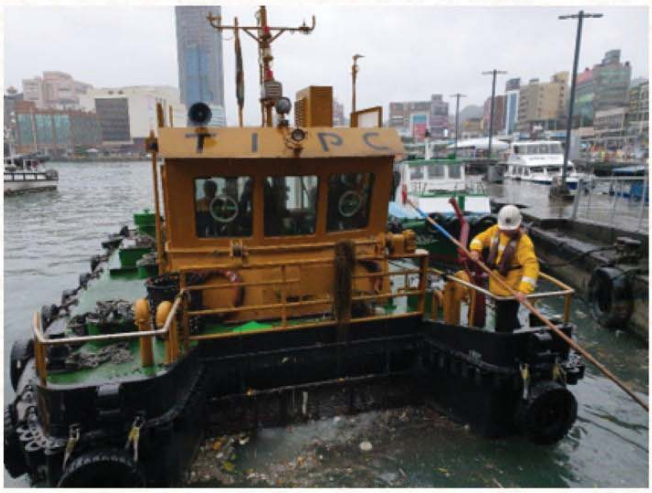
Source: EPA,OCA

Strategies for Combating MD- Underwater Removal

- Encourage volunteers with scuba diving skills to assist in removing underwater wastes

Strategies for Combating MD -Inside harbor cleaning

- Clean Vessel
- Driftwood Boom
  - Deploy driftwood boom before typhoons to intercept driftwood from river waterway to the harbor



Source: TIPC、Local government (Kaohsiung)

Recycling Network-PET Bottle

FENC Successful Closed Loop Project

Ocean Plastic turn to Textile
FENC X Adidas X Parley

Bottle transforms to Textile
FENC X Adidas X Nike
(2019 European Football League/ 2018 World Cup)

Source: FENC

遠東新世紀 FAR EASTERN NEW CENTURY

ANNIVERSARY 遠東70週年慶

Recycling Network-PET Bottle

FENC Successful Closed Loop Project

公益財団法人 日本容器包装リサイクル協会
The Japan Containers and Packaging Recycling Association

遠東新世紀 FAR EASTERN NEW CENTURY

Bottle to Bottle
FENC X JCPRA

TOKYO DISNEY RESORT®

Bottle to Bottle
FIGP X Disneyland

遠東石塚グリーンペット株式会社
Far Eastern Ishizuka Green PET Corporation

Bottle to Bottle
FIGP X COKE & 7-11

Source: FENC

遠東新世紀 FAR EASTERN NEW CENTURY

FAR EASTERN GROUP 70 ANNIVERSARY 遠東70週年慶

Recycling Network-Waste Fishing Net

Recycling Chain of Wasted Fishing Net

COA/ FA	EPA/EPB	MOEA /IDB
Fishermen, Fishermen's Association	Recycling industry	Plastic Raw Materials industry
Gathering of waste fishing nets in fishing port	Cleaning Dismantling Sorting PET Nylon 6 PE/PP	Physical recovery method Chemical recovery method

Source: PIDC

塑膠中心

Recycling Network-Waste Fishing Net

Nylon 6 Recovery Method

Physical Recovery Method

Dismantling → Cleaning → Cutting → Extruder → cutting → Recycled Nylon 6 Chip

Extruder → Filter → Impurity

- Simple process
- low cost
- Poor quality

Chemical Recovery Method

Dismantling → Cleaning → Cutting → Cleaning → Depolymerization → Raw Material (CPL) → Polymerization → Cutter → Extraction → Dryer → Recycled Nylon 6 Chip

- Complex process
- high cost
- Excellent quality

Source: PIDC

Recycling Network-Waste Fishing Net

Waste Fishing Net Recycling Product

Gathering of Waste Fishnets

Cleaning and Removing Impurities

Physical

Chemical

Melted & pelleted

Depolymerise & pelleted

PIDC

福懋興業股份有限公司
FORMOSA TAFFETA CO., LTD.

ECOMAX® TEXTILE CO.,LTD.

Recycling Network-Waste Styrofoam

Liteon Styrofoam Recycle Loop

Recycling Product

Marine Debris

SEAHOPE

Styrofoam

Recycle

STYRO CYCLE

Source: Liteon

LITEON

Future Outlook and Trends

Legislation & Regulation

- Improving Regulation to reduce the use of plastic(source control)
- Coordinate the authorities of various departments and Integrate resources of organizations

Networking

- Publics, NGOs, enterprises, GOVs working together to :
  - Resource recycling
  - Zero waste
  - Circular Economy

From MD to Circular Economy

Incentives

- To encourage the MD removal
- To remind the enterprises of social responsibility

Innovation Tech.

- Value-added in further recycling technology development
- From Brown to Gold

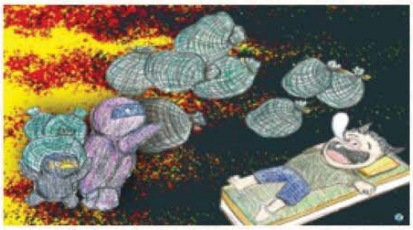
Education

- Marine environmental education campaign since childhood

Ocean Protection Education from Childhood

Education Strategy-Picture Book

The picture book published by OCA combines marine debris, conservation and integrity



Source: OCA

Thank you

We are part of the world.

Protecting the Ocean is our mission.

Plastic Issues

evolving from Waste Management to Circular Economy

Chun-hsu Lin 林俊旭 Ph.D.
Research Fellow, Deputy Director
Center for Green Economy
Chung-Hua Institution for Economic Research

CGE in CIER

◆ Chung-Hua Institution for Economic Research (CIER)

- Established in 1981
- A think tank with about 400 employees
- Focused on the research of economic issues, mainly serving Taiwanese government for the policy analysis

◆ Center for Green Economy (CGE)

- Established in 2013 under CIER
- Specialized in environmental economics, international trade and green policies
- With about 30 research fellows, assistants, supporting staff members.

CIER

CGE
the Center for Green Economy
綠色經濟研究中心

About Dr. Chun-hsu Lin

- **Education**
  - Ph.D. in Environmental and Natural Resource Sciences, Washington State University, USA, 2001
  - Master of Regional Planning, University of Pennsylvania, USA, 1993.
  - BSc in Civil Engineering, National Taiwan University, 1989
- **Experiences**
  - Chung-Hua Institution for Economic Research
    - Research Fellow , since Oct. 2010
    - Associate Research Fellow, International Division, 2005~2010
  - Green Trade Project Office, Ministry of Economic Affairs
    - Secretary-General, 2011~2016
  - Institute for Environment and Resources
    - Associate Research Fellow, 2001~2005

Taiwan Basics

***Taiwan* is an export-driven economy,**

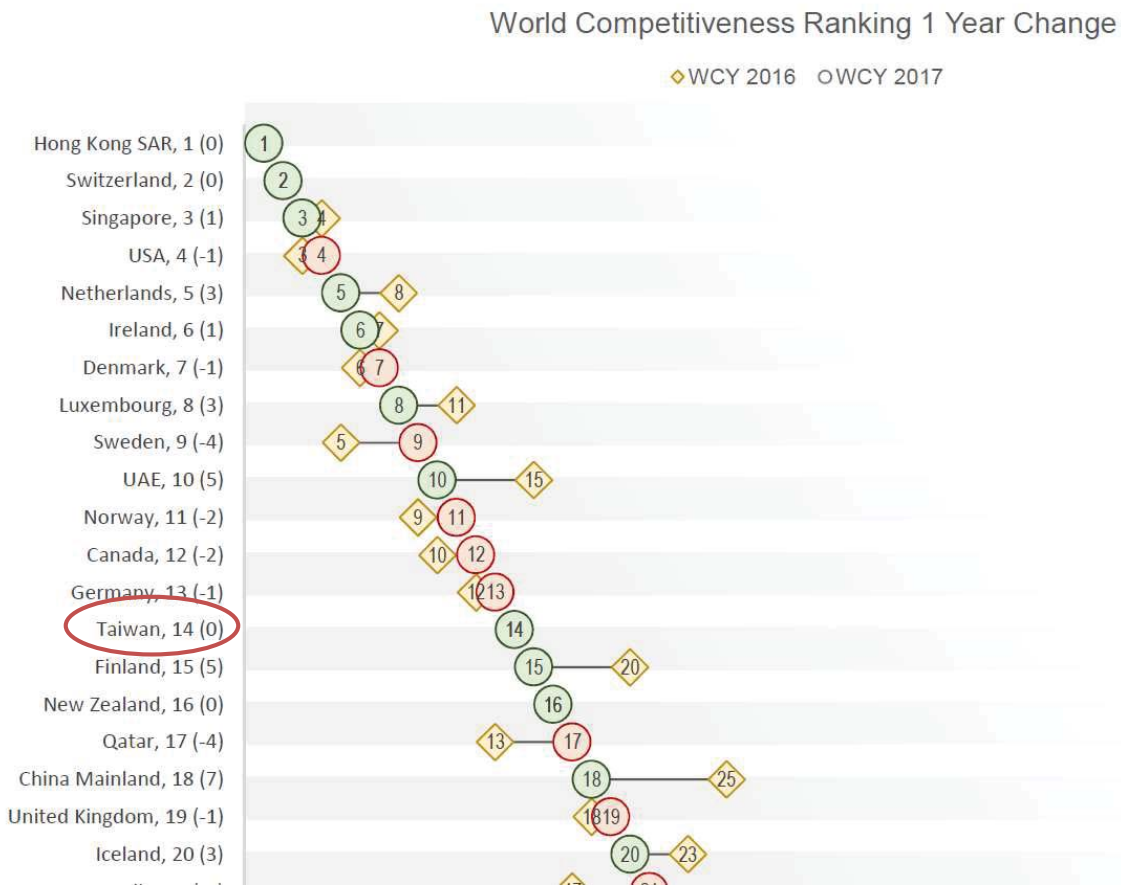
Ranked 20th largest economy in the world.

Item	Data of the year 2017
Population	23.6 million
Gross Domestic Product (GDP)	575.5 billion (country comparison to the world: 20)
GDP per capita	US$ 24,402
Economic Growth Rate	2.9%
Total Exports / Imports	US$ 317 billion / US$ 259 billion

Source: Department of Statistics, Ministry of Finance, "Summary of Exports and Imports for March, 2018"

Ranked 14th in Competiveness worldwide

Source : * IMD World Competitiveness Yearbook 2017



Waste Disposal Facilities in Taiwan

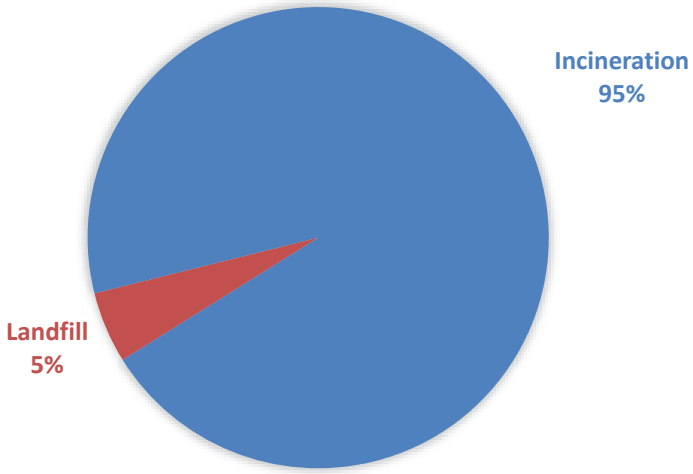
Landfill Sites

There are 67 landfill site in Taiwan, but all of the landfill site are almost saturated

Incineration Plants

There are 26 plants in Taiwan , and the capacity is 19,941 ton per day.

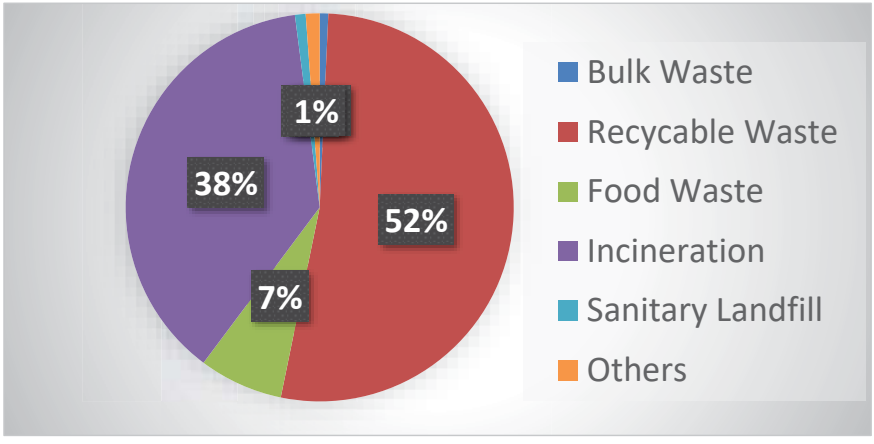
MSW TREATMENT



Municipal Solid Waste Composition
In 2017 (thousand tons)

• **Total Generation**	7,871
• **Bulk Waste**	56
• **Recycables**	4,133
• **Food Waste**	551
• **Incineration**	2,970
• **Sanitary Landfill**	70
• **Others**	91

Generation Per Capita Per Day: **0.915 Kg**



Source: Yearbook of Environmental Protection Statistics, Taiwan, 2018

Three-in-One Trash Collection

Three Categories to be collected:

1. **General Trash:** unit-pricing bags required
2. **Kitchen Waste:** no unit-pricing bags are required
3. **Recyclables:** no unit-pricing bags are required

- **Unit-price bag system adopted in July, 2000**
- **kitchen waste collection started in December, 2003**

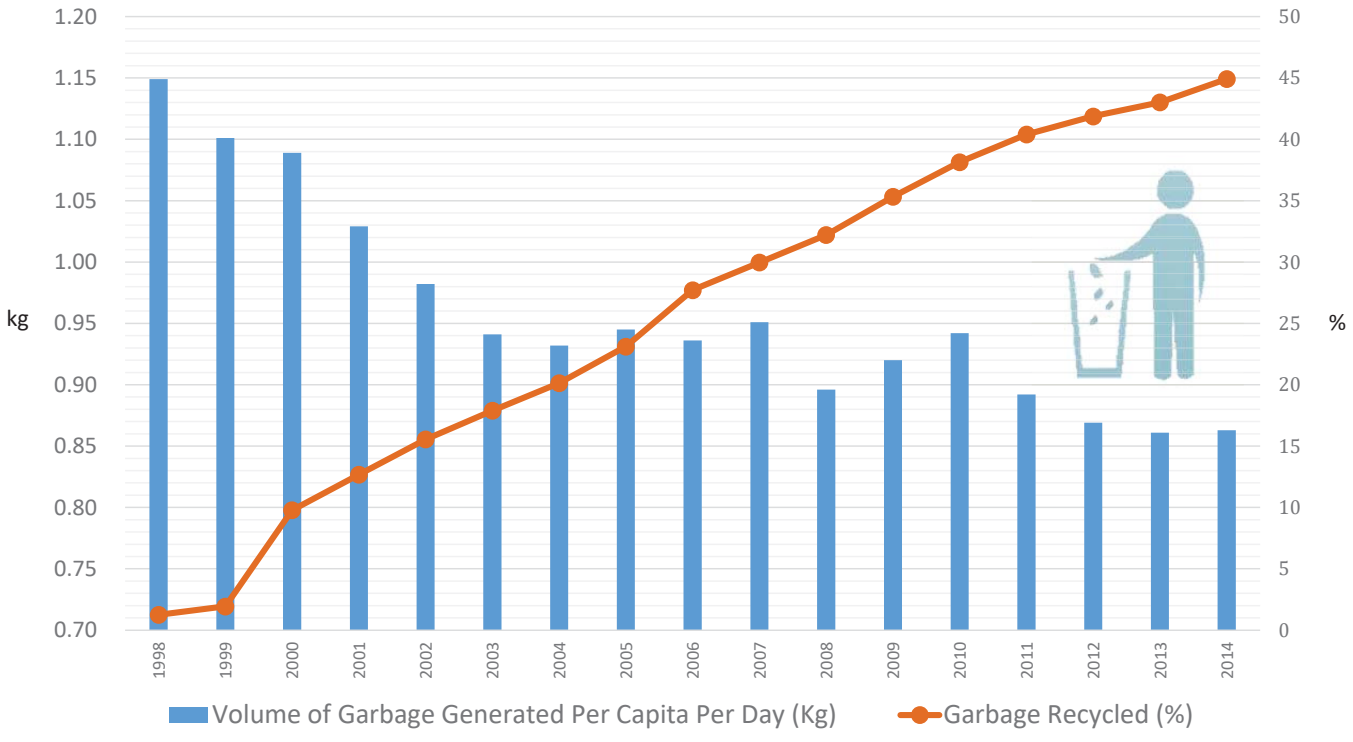
Giant Article Collection

Citizens who want to discard large furniture or appliances can call local environmental agency to arrange a pick up service for FREE

After the appointment is made, citizens should move the large waste to outside of their buildings after 22:00 for pick-up next day

Unit-Pricing Bags

Garbage Generated & Recycled



Source: Yearbook of Environmental Protection Statistics, Taiwan, 2015


THREE incinerators right in Taipei City
but
✓ lack of trash to burn
✓ Life time limitations on incinerators
13


Recycling in Waste Management
The Extended Producer Responsibility (EPR) Scheme

Recycling Management Policy

Waste Disposal Act (WDA) — **Resource Recycling Act (RRA)**

Market-driven recycling only

Producers were responsible for recycling physically and financially

Producers pay recycling fees to eight recycling funds

The eight recycling funds are administered by EPAT's Recycling Fund Management Board

1984 Garbage open dump

1987 MSW policy initiated – landfill

1990 Polluter Pays Principle" introduced

1997 MSW policy adjusted – shift to Incineration

1999 Four-in-one Recycling Program

Waste Household appliances collection and Storage

Waste Home appliances recycling enterprise setup

2002 Source reduction restriction of Plastic Shopping Bags and Disposable Tableware

Resource Recycling Act initiated

2003 •Zero waste

•Resource regeneration and reuse

2004 Prospects and evaluation on MSW treatment program

Zero waste policy

2005 Mandatory garbage sorting – keep trash off the ground

2007 Resource recycling promotion plan for general waste

2010 •Reactivate landfill site

•Construct Biomass-energy Center

SEA for waste treatment

Mandatory Items for Recycling

• Tires	1989
• Lubricants	1990
• Car batteries	1990
• Automobiles	1994
• Motorcycles	1994
• Household appliances	1997
• IT objects	1997
• Batteries	1999
• Fluorescent lamp	2002

☐ PET containers	1989
☐ Ferrous containers	1989
☐ Aluminum containers	1989
☐ Pesticide containers	1989
☐ Foamed PS containers	1991
☐ PS containers	1992
☐ PVC containers	1992
☐ PP/PE containers	1992
☐ Al foil containers	1992
☐ Glass containers	1993
☐ Paper containers	1993

In addition to EPR

Voluntary Programs

- Mobile Phones Take-Back Program
  - Since 2004
  - MOU signed between EPAT and 19 producers/service providers/retailers
  - 12,446 collection points as of now
  - ***No min collection requirements***

In addition to EPR

Mutually Agreed Programs

- Styrofoam Take Back Program
  - Since 2003
  - Agreement signed between EPAT and Styrofoam Recycling Association to take back the Styrofoam for packaging uses
  - The Association need pay at least US$ 0.03/kg or US$ 17/truck to local authorities
  - Min collection requirement: 60%

Plastic Source Reduction Plan by EPA Taiwan

Top 5 plastic wastes found on Taiwan's seashores:

PET bottles, Straws, Tableware, Cups, Bags

Targets	2020	2025	2030
Shopping Bags	Single-use plastic bags charged in the shops who are issuing receipts	Single-use plastic bags charged in all shops	Single-use plastic shopping Bags banned
Straws	No single-use plastic straws provided in restaurants for dining-in customers	No single-use plastic straws provided in all restaurants and tea/coffee shops	Sing-use plastic straws banned
Cups	Discounts with purchases when own cups/mugs used	Single-use plastic cups with charge only for limited uses in all restaurants and shops	Single-use containers for drinks banned
Tableware	No single-use tableware provided in restaurants for dining-in customers	Single-use plastic tableware only for limited uses with charges	Single-use plastic tableware banned

Current Regulations on Shopping Bags

No free plastic shopping bags from stores

Regulated bodies since 2011	New-added bodies in 2018
• Public Sectors	• Drugstores/Cosmetics Stores
• Private schools	• Medical Devices Stores
• Shopping centers	• 3C Product shops
• Wholesales stores	• Bookstores/stationary stores
• Supermarkets	• Laundry shops
• Convenient stores	• Coffee/Tea shops
• Fast food restaurants	• Bakery stores
20,000 stores regulated	100,000 more stores regulated

Current Regulations on Tableware

Since 2006

Regulated Bodies (100,000 shops)	• Public Sectors • Private schools • Shopping centers • Wholesales stores • Supermarkets • Convenient stores • Fast food restaurants • Restaurants and food shops
Regulations	• No single-use plastic tableware is allowed in the regulated bodies • Fiber or bio-degradable tableware is OK
Fine for Violations	• 1st time violation: warning • 2nd time and repeated violation: fine from US$ 40-200/audit

Current Regulations on Cups

for taking back single-use cups or incentives for carrying own cups

Mechanisms	Incentives for drink customers
• Rewards for single use cups take-back	• 2 single-use cups of store brand for NT$ 1
• Rebate for using own cups	• >NT$ 1~2 off or 10% discount for purchase of drink
• Point collection for using own cups	• 10 points for a NT$30 store coupon
• Drink upgrade for using own cups	• Upgrade from Medium sized drink Large sized drink



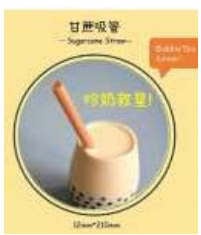
Governmental and Private Campaigns

Shopping Bags

- Own bags
- "Rebag"
- Integrated trash bags
- Alternative materials

Straws

- No use
- Repeated uses
- Alternative materials



Cups

- Incentives for carrying own cups
- Leasing
- Washable cups

Tableware

- Reusable tableware
- Leasing
- Own tableware

Ban on products containing plastic Microbeads

Since 2018

Regulated Targets

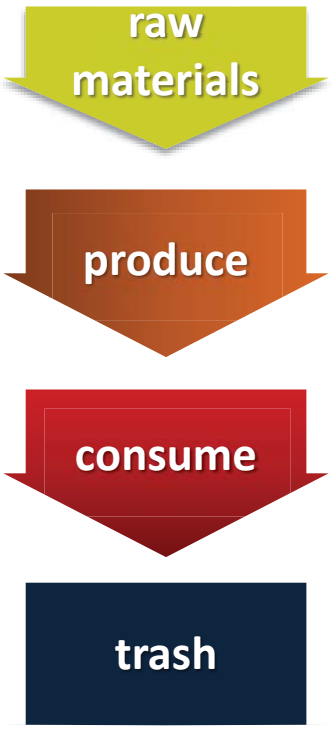
- Shampoo
- Soap
- Facewash cream/liquid or cosmetics
- Scrub cream
- Liquid materials for bathing
- toothpaste

Fine for Violations

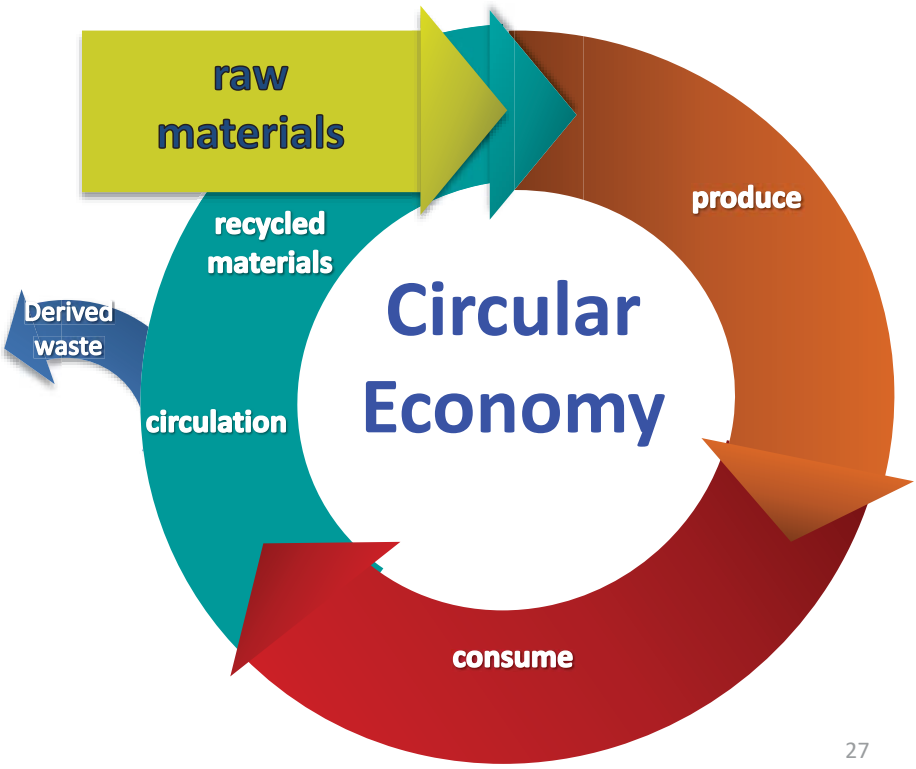
Importers: US$ 2,000~10,000
Sellers: US$ 40~200

Circular vs. Linear Economy

Linear Economy



Circular Economy



How about a Shirt made with recycled PET bottles ?

Source: http://www.soccerbox.com/blog/how-nike-manufacture-football-jerseys-from-recycled-bottles/

Far Eastern New Century • **The Food Grade recycled polyester materials from PET bottles**

How about a Blanket or Scarf made with recycled PET bottles ?

DA.AI Tech. Corp. • Eco Blanket

Increasing Circular Value Chains

fromwaste

to regenerated plastic pellets

to consumer products

Next with Plastic Bags
Official financial schemes than regulations?

Investigation Purposes

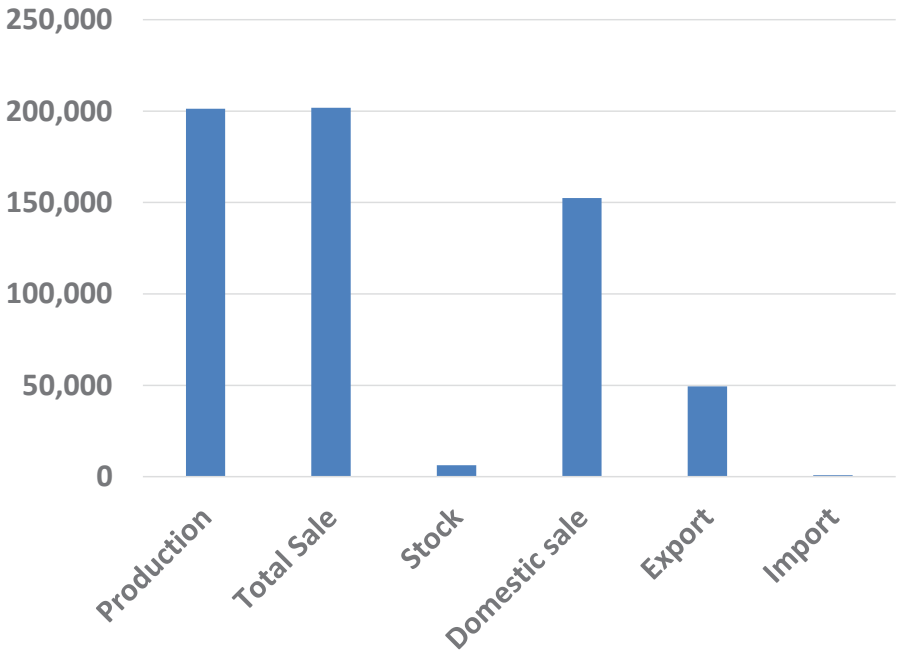
- Levy on plastic shopping bags instead of requiring some stores to charge on customers?

What are the international experiences?

How is its feasibility and effectiveness?

What are consumers' behaviors, expectation and awareness?

Legal requirement and readiness



- Annual Production:
  US$ 1~1.5 Billion
- No. of Total Employees:
  15,000
- No. of Producers:
  800

Status of Plastic Bag Industry

(unit: tones/year)

Status of Plastic Bag Recovery

- Take-back by local governments in 2016:
  8,589 Tones
  Collection Rate: **11.75 ~ 13.6%**
- Capacity of plastic regeneration facilities: 1,055.6 Tones/Month, much lower than domestic sales
- Collectors pay NT$ 0.11~2.1/kg from local government and sell it at NT$ 4.9~16/kg after cleaning and sorting
- RDF system under construction

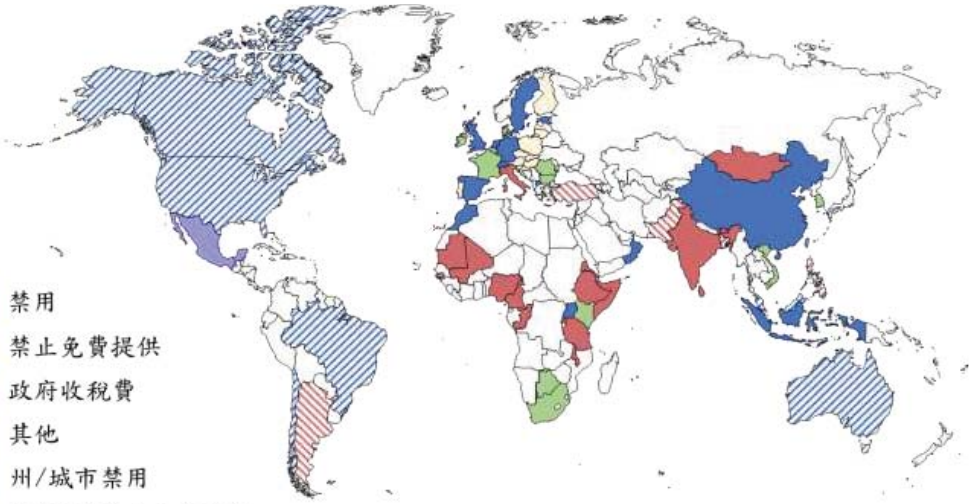
REUSE
REDUCE
RECYCLE

Alternatives of Plastic Shopping Bags

1. Material and design changes
2. Combining with other uses
3. Reuse and sharing programs (reBag, UBag)

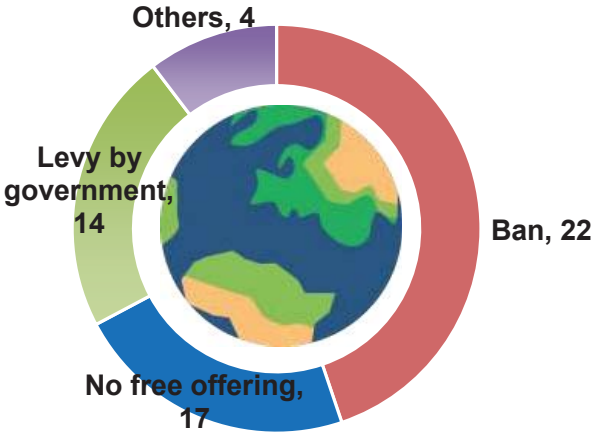
International Strategies on Shopping Bags

- Around 60 countries/regions have adopted control strategies since 1990s
  - **Ban on use**
  - **Charged with Fee**
  - **Tax and Levy**
  - **Propaganda**



Data Source：Summarized from Earth Policy Institute, 1 May 2014, www.earth-policy.org

International Experiences on Shopping Bag Control



Ban

成功 失敗 無明顯說明

No free offering

成功 失敗 無明顯說明

Levy

成功 失敗 無明顯說明

Info sources:
Summarized from Earth Policy Institute, 1 May 2014
www.earth-policy.org

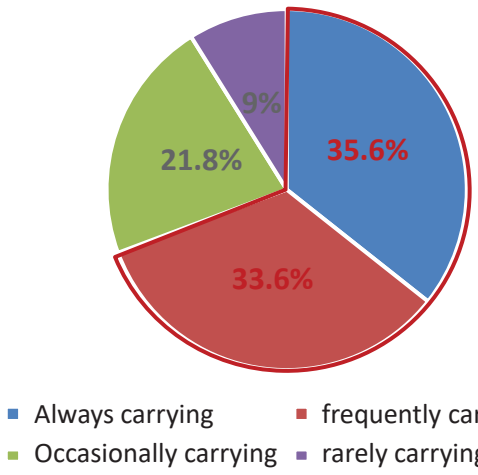
Survey on Consumers' Behaviors and Attitude toward Levy on Plastic Shopping Bags

◆ 1068 surveys conducted in 2017 through Internet with 95% confidence level

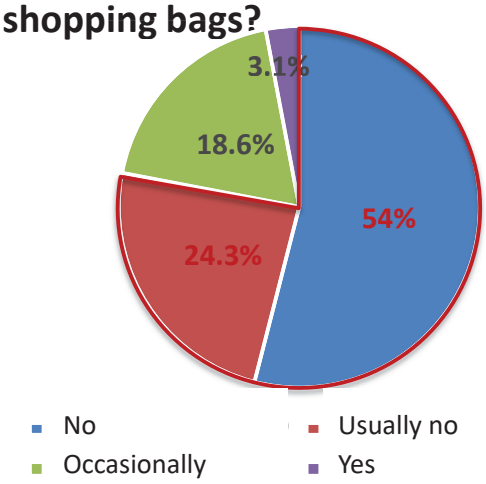
Experiences of using plastic bags	• Consumer behaviors • Frequency of getting a plastic bag • Reasons of getting plastic bags
Willingness to pay	• The price range willing to pay for different sizes of plastic bags
Preferences of fund usage	• The owner and operator of plastic fund • Supportiveness of fund
Basic Information of survey	• Sex, age, occupation, income, location, education

The Behaviors

Do you carry own shopping bags while shopping?



Will you ask for shopping bags even carrying own shopping bags?

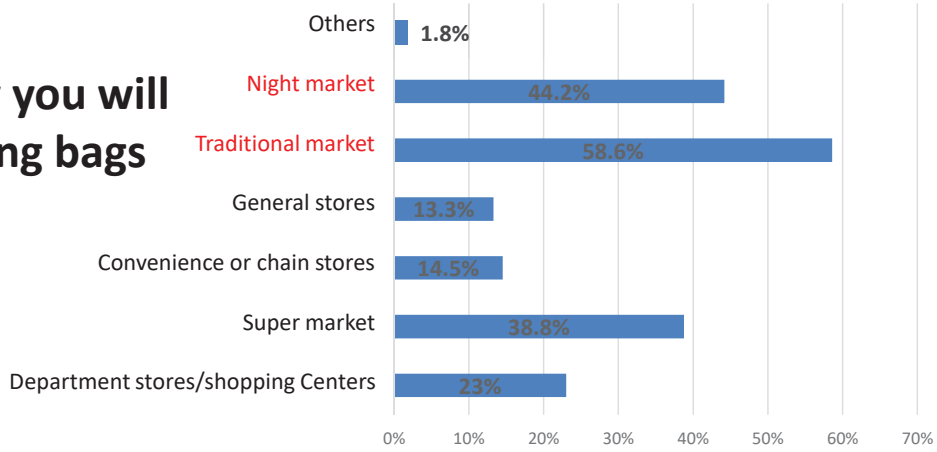


Conclusions

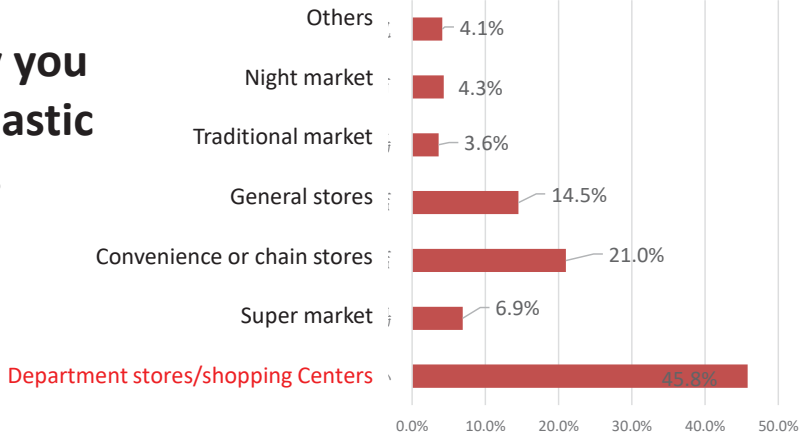
- Most of people will carry shopping bags when shopping **(69.2%)** ◦
- Once carrying own shopping bags, no need to purchase or ask for shopping bags **(78.3%)** ◦

The Behaviors

Where usually you will ask for shopping bags

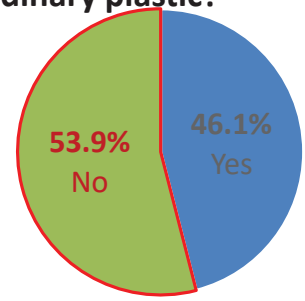


Where usually you will get non-plastic shopping bags

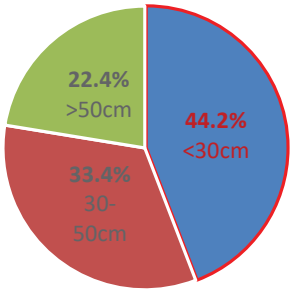


The Behaviors and Attitudes

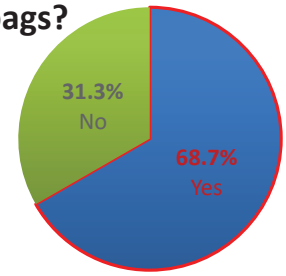
Can you distinguish biodegradable plastic from ordinary plastic?



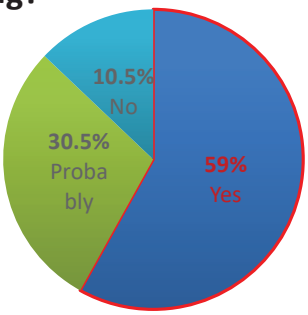
What are the sizes you asked for?



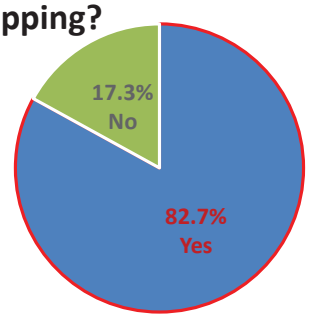
Have you noticed the recycling marks or material ID on plastic bags?



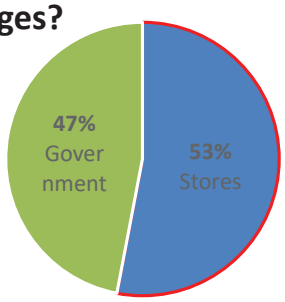
Does charge discourage you to get a shopping bag?



Have you ever bought a shopping bag after you shopping?



Who should be in charge to the fund accumulated by fee charges?



The Behaviors and Attitudes

Why asking for shopping bags

- Characteristics of contents
- Sanitary reasons
- Various items to carry
- For conveniences
- For special purposes (ex. gift)
- Seller's offer
- For private collection
- Because seller will offer

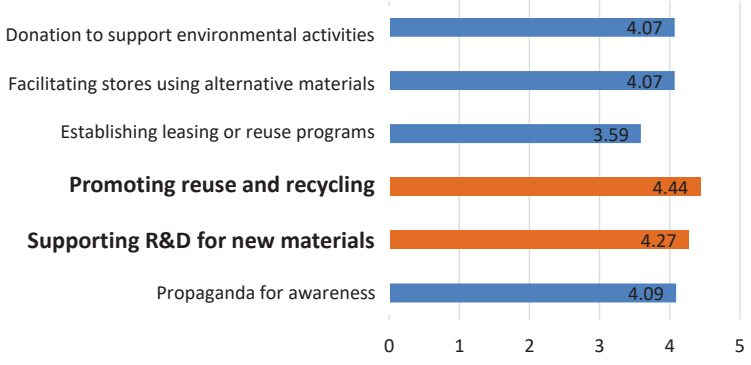
The price willing to pay

Bag Sizes	Price/bag
<50 cm	NT$ 1.74
>50 cm	NT$ 3.13

Materials of shopping bags to get

- Plastic
- Paper
- Bio-degradable

Preferred usage of the fund



Survey on traditional markets

◆128 on-site face-to-face interviews in traditional markets in Taipei, 2017

- Most interviewees are:
  - Retired
  - house-keeping females (85%)
  - above 60 years old (36%)

Behaviors in traditional markets

◆Frequency of going to traditional markets:

- More once a week

Age	weekly		twice/week		daily		biweekly or longer	
	No.	%	No.	%	No.	%	No.	%
>60	12	24%	**17**	**49%**	**13**	**42%**	**4**	**31%**
55-59	6	12%	4	11%	7	23%	0	0%
50-54	**14**	**29%**	4	11%	4	13%	1	8%
45-49	6	12%	4	11%	2	6%	1	8%
40-44	6	12%	4	11%	3	10%	3	23%
35-39	2	4%	0	0%	1	3%	1	8%
30-34	1	2%	1	3%	0	0%	2	15%
25-29	0	0%	1	3%	0	0%	1	8%
20-24	0	0%	0	0%	0	0%	0	0%
<20	2	4%	0	0%	0	0%	0	0%
Total	49	100%	35	100%	31	100%	13	100%

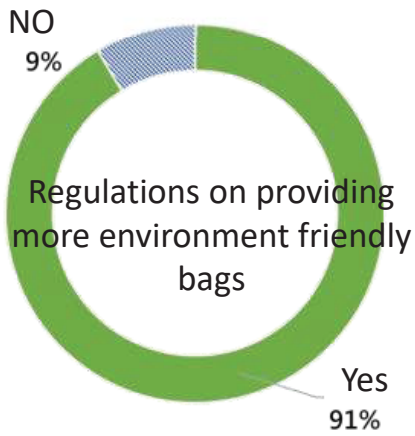
Behaviors in traditional markets

ITEMS	No. of bags	No. of non-carriable bags	Percentage of needing bags even the items are already packed
Meat, Seafood, Eggs	1.22	**1.17**	**78.1%**
Fruits, Vegetables, Grains	**1.92**	0.85	**34.3%**
Processed food	0.42	0.43	12.5%
Cooked food	0.80	0.72	**44.5%**
Food with packaging	0.25	0.20	3.9%
Non-food	0.34	0.17	3.1%
Total	**4.95**	**3.55**	

◆**91.4%** of shopping bags will be reused

◆**Repeated Uses: 1.71 times**

Attitudes in traditional markets



Uses of Fund	Facilitating using alternative materials	Promoting public awareness	Upgrading recycling program	Donation to environmental activities
Overall supportiveness	3.477	**3.633**	**3.672**	3.125
Pro-charge supportiveness	**3.74**	3.72	**3.76**	3.19
Con-charge supportiveness	2.77	**3.40**	**3.43**	2.94

Fund used to promote recycling is more preferred

Summary

- In Taiwan, 60~73 Thousand Tones of plastic bags consumed 11.75 ~ 13.6% collection rate and low recycling benefits
- More consumers get plastic bags for free from non-regulated sectors such as traditional markets but the quantity is less and and the sizes are smaller than before
- Bag charge does discourage the needs for plastic bags. More people agree to reduce the demands for plastic bags by higher charges
- Shopping bags usually are reused for 1.71 times.

Conclusions and Policy Suggestions

- "User Pays" principle is well accepted. High cost discourages plastic bags demand
- Legal basis to impose levy on plastic bags needs clarified or amendent on current legislations.
- In the short term:
  - Voluntary scheme
  - Multi-uses of shopping bags and trash bags
  - Information disclosure about the use of plastic bags to encourage reduction
- In the long run:
  - Study on the necessity of levy on plastic bags, scope, targets and fund management of levy.

How to pursue Circular Economy…in addition to Recycling and Restrictions?

Government (EPAT) Approach to Enhance…

- Sorting mechanisms
- Organic waste/materials to energy
- Inorganic materials to construction materials
- E-Waste Recycling
- New Business models

How can private business achieve CE?
Taiwan Alliance for C2C

SINGTEX® 中台資源科技股份有限公司 CHUNG TAI RESOURCE TECHNOLOGY CORP. 新北市政府 環境保護局 sintex Technology for Green Living
Dr. Green 綠博士 Oswald Essence EPEA Taiwan DA.AI Coexist with the Earth BASF The Chemical Company
紡織產業綜合研究所 Taiwan Textile Research Institute 工業技術研究院 Industrial Technology Research Institute 行政院 環境保護署 地球公司 GLOBE TAPE
財團法人 塑膠工業技術發展中心
寶成國際集團 POU CHEN GROUP
TAiWAN Cradle to Cradle Taiwan
T.E.F.P 大鄴企業
立順興資源科技股份有限公司 RE-SOURCE TECHNOLOGY CO., TLD.
藍天大地有限公司 Azureland Organic Co., Ltd. Azure Canvas Organic Cotton
台灣綠領協會 TAIWAN GREEN COLLAR ASSOCIATION Shine Young Everlight Chemical 福泰飯店集團 FORTE HOTEL GROUP
wistron 緯創資通
MINLAN FABRIC INDUSTRIAL CO., LTD. TÜVRheinland® Precisely Right. 大地旅人 Earth Passengers http://earthpassengers.org SJ GROUP
大豐環保科技股份有限公司 Buotex FABRICKING J. J. Pan

Taiwan Green Economy Initiative
by CGE/CIER

Taiwan Circular Economy Awards

Since 2019

- ***Issues:***
  - ***Guidelines for Industries***
  - ***Technology Limitations***
  - ***Financing and Marketing***
  - ***Inter-industrial Cooperation***

- ***Taiwan Circular Economy Awards***
  - *Initiated by CIER*
  - *Training Workshops (2018)*
  - *Forum and Ceremony (3/26/2019)*
  - *Promotion (All future years)*

Background

➢ **Objectives**

- **Circular Economy (CE) is one of the core policies**

  "The 5+2 Industrial Innovation Plan"

- **To create a strong environment and economy through economic processes**

➢ ***Awards***

1. Corporate Award 企業獎

2. Product Award 產品獎

3. Innovation Award 創新獎

4. Multi-Industry Award 跨界獎

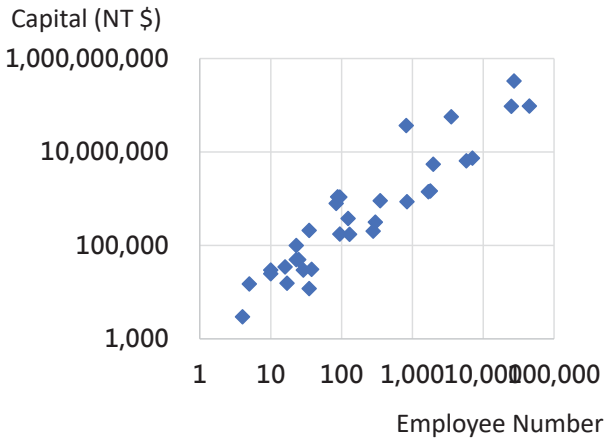



– **Grading**

- **Quantitative & Qualitative**

Participants in 2019

Award	1st Round Review	2nd Round Review
Corporate CE Award	15	8
Product CE Award	23	13
Innovation CE Award	26	17
Multi-Industry CE Award	16	7
Total (Project)	**80**	**45**
Total (Business)	**52**	**33**



Award Ceremony and Promotion

March 26, 2019

2019 Circular Economy Award Spotlight

Taiwan Sugar Corporation
台灣糖業

Pig’ s gallbladder shampoo

E&E Recycling
綠電再生

Metal Recycling

- From 2000 to 2017
- 136,718 tons
- Eiffel Tower *18.7

Singtex
興采實業

Clothing made from coffee grounds

2019 Circular Economy Award Spotlight

Chen Ya Resource Technology Corp.
成亞資源

Silicon briquettes generates no further industrial waste

San Fu Chemical
三福化工

- The 1st company to develop TMAH recycling technology in Taiwan
- Water saving = Olympic-size swimming pool *260
- CO2 Reduction: Daan Forest Park (Taipei) *46

AU Optronics
友達光電

The Lungtan fab achieved the target of 100% process water recycling


Thank You
Partnership with CIER/CGE!
Dr. Chun-hsu Lin:
chlin@cier.edu.tw

"MARINE PLASTIC LITTER and CIRCULAR ECONOMY"

ADUPI

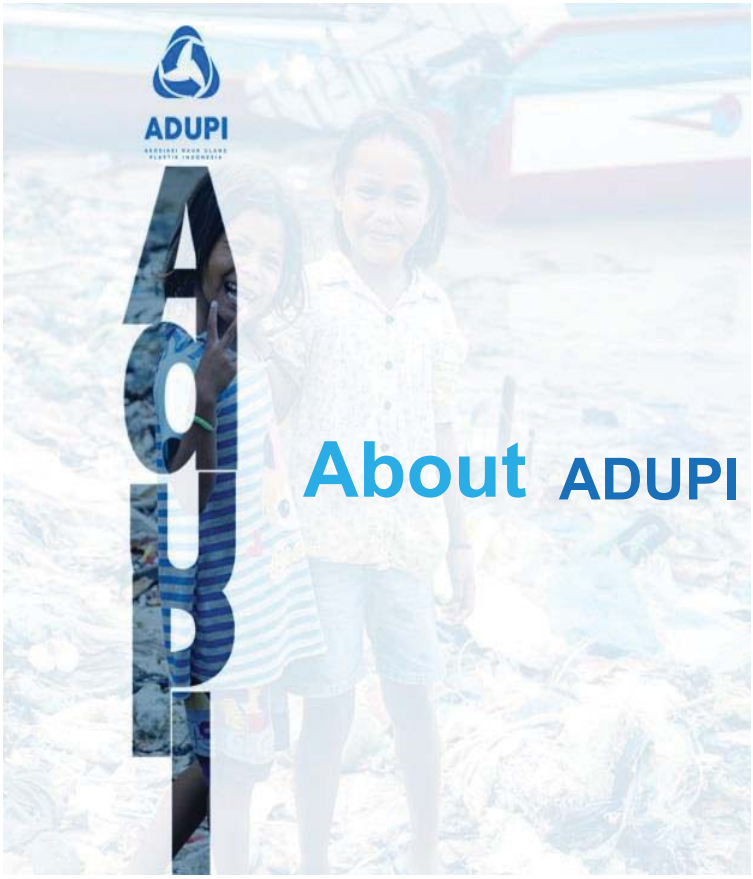
Indonesian Plastics Recycling Association

Presented by Felicita Yanti

What is ADUPI

ADUPI

ASOSIASI DAUR ULANG PLASTIK INDONESIA



About ADUPI

- Established in 2015 in Surabaya, East Java.
- Previously named AIDUPI.
- Founded by plastic recycling entrepreneurs.
- To create a conducive recycling business by working with all the stakeholder.
- At present ADUPI has 7 regional representative office: Greater Jakarta, West Java, Central Java, Jogja/Solo and East Java, West Nusa Tenggara, Papua.

ADUPI

VISION & MISSION

Vision

Becoming a beneficial association for members and the government in the prevention program for plastic waste pollution on the environment.

Mission

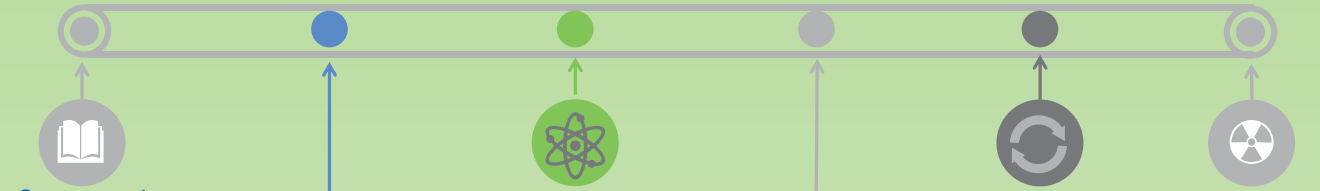
- Fight for members' aspirations, increase cooperation, and communication between members with the Indonesian government.
- Improve services and help members provide direction related to government policy.

What is Recyclable

Easy to Recycle

Hard to Recycle

• Recycling Agent in INDONESIA



Scavenger / Waste Bank
Collecting garbage

Collectors
Receive and do the initial sorting of plastic waste

Grinder
- Sort by type and color
- Grinding plastic into a smaller form

Processor
Processing the results of the granule into semi-finished raw materials, for example, plastic pellets, etc.

Converter
- Processing semi-finished materials into finished products.
- For example PSF, film sheets, plastic bottles, tools "household, plastic bags, etc.

Wholesaler
Selling finished products to consumers

Other Aspect of Recycling

Indonesia has around 5 million pickers, they are part of the recycling chain.

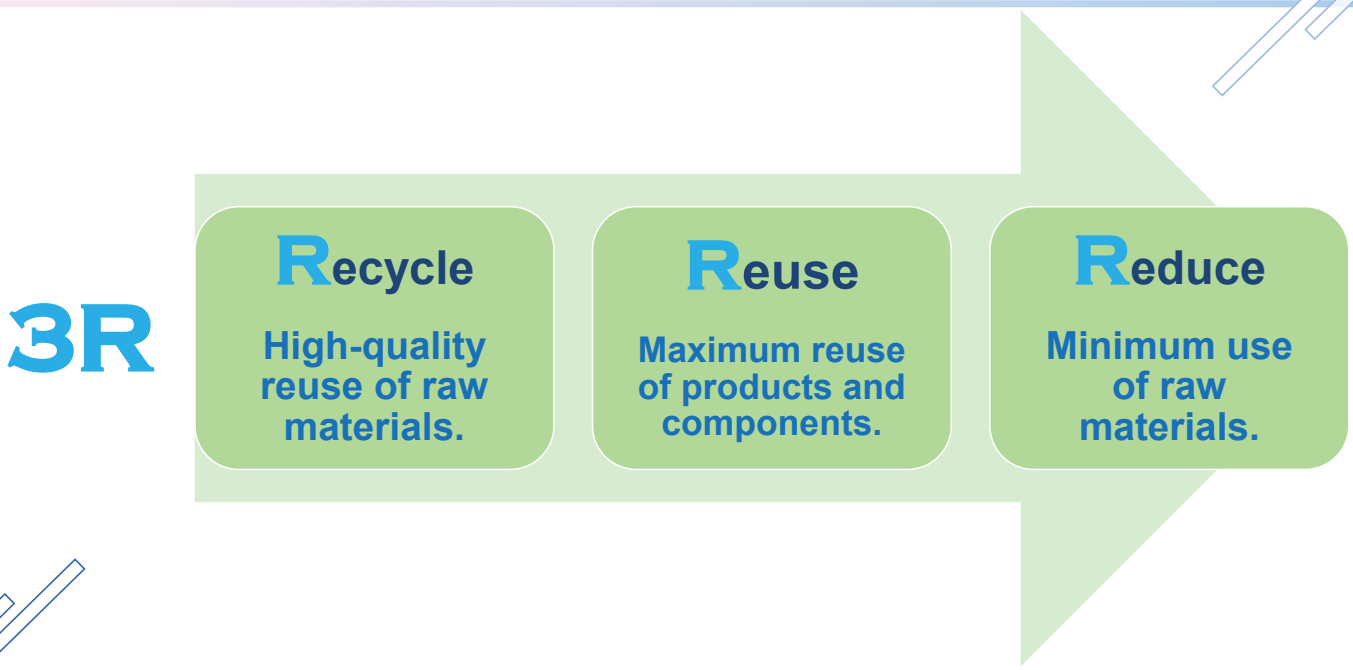
Informal sector has a big impact in the recycling process.

Plastic Recycling & Circular Economy

Plastic is an important and inevitable material in our daily life and our economy.

Circular Economy is a system of continuous use of material or resources, thus eliminating waste (whenever possible).

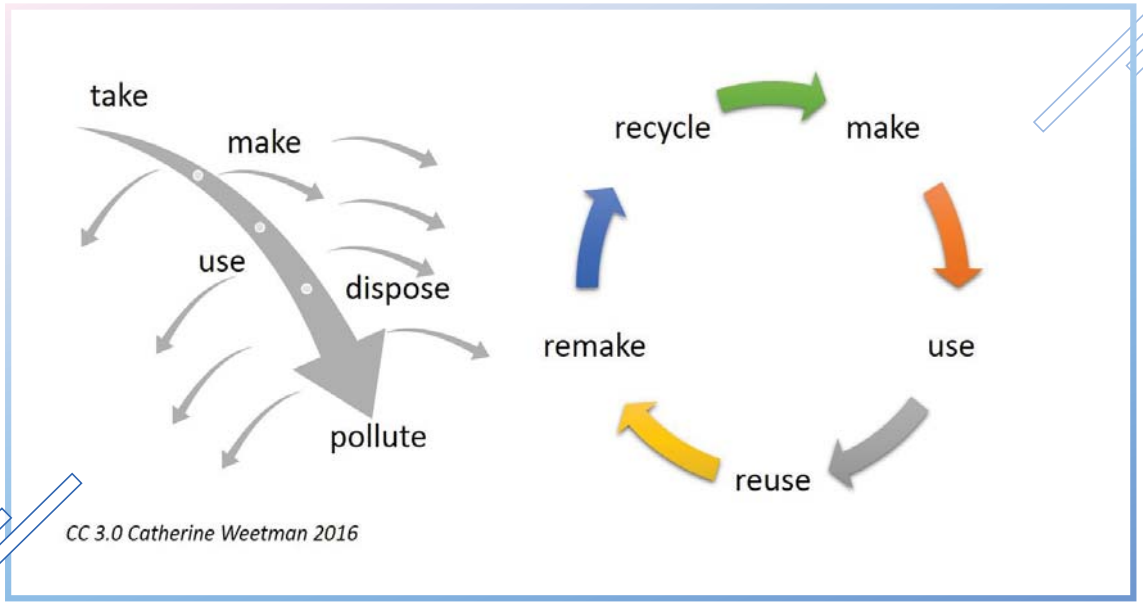
Plastic Recycling & Circular Economy



Purpose of Recycling and Reuse (Circular Economy)

- Reducing the use of natural raw materials or natural resources.
- Pollution prevention.
- Save energy.
- Provides income to several stakeholders.
- State foreign exchange savings.
- The raw material will never run out because it keeps returning to the cycle.

Plastic Recycling & Circular Economy



Different Aspect from Recycling Industry
Public Perception

Dilemma	Glass	Alluminium	Paper	Plastic
Perception	Good	Medium	Good	Bad
Recycling	Good	Good	Medium	Good
CO2	Bad	Bad	Medium	Good

Indonesia's Waste Management Law No 18/2008

- This law is not all implemented.
- Misunderstanding/missed interpretation- banning plastic bag/Straw/Styrofoam.
- Local government lack of knowledge and/or understanding about waste management, especially in the plastic sector.
- EPR & CSR is not managed properly.

PLASTIC INDUSTRY IN INDONESIA

Important industrial sectors that have links with many other industries.

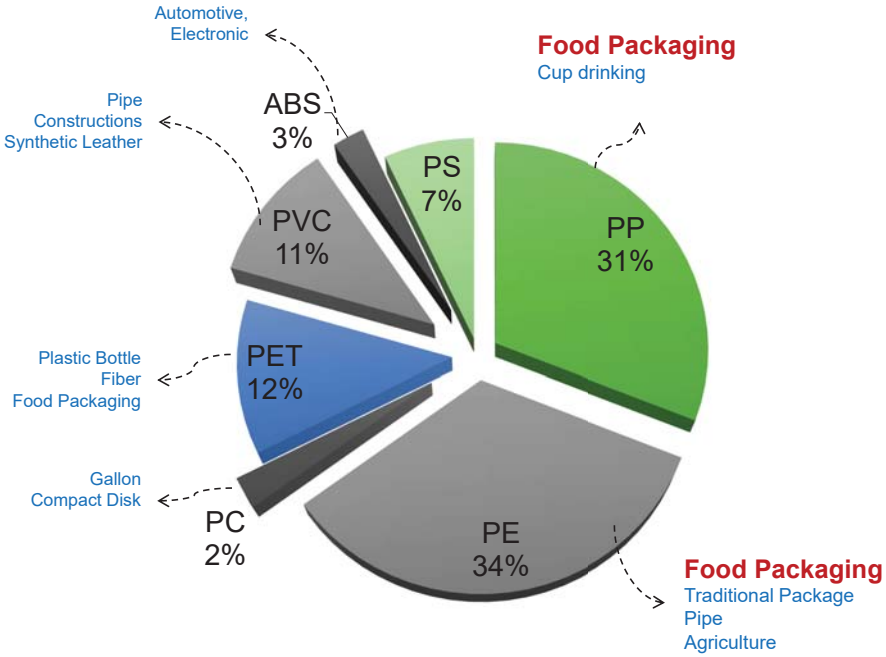
In 2018, the demand for plastic goods is 7.6 million tons, which is supplied from national production of 6.74 million tons and imports of 854 thousand tons.

The need for raw materials is supplied from within the country (2.33 million tons), imports (3.66 million tons); and scrap / recycle (1.23 million tons).

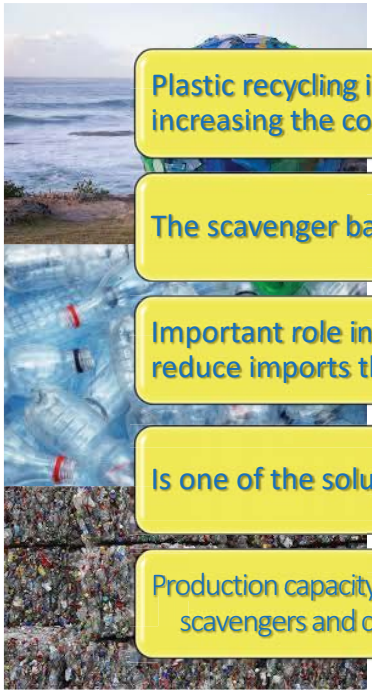
Per capita consumption is still low (28 kg / year) and has the potential to grow.

The population of 1,580 companies absorbs 132 thousand workers.

PROFILE OF PLASTICS CONSUMPTION

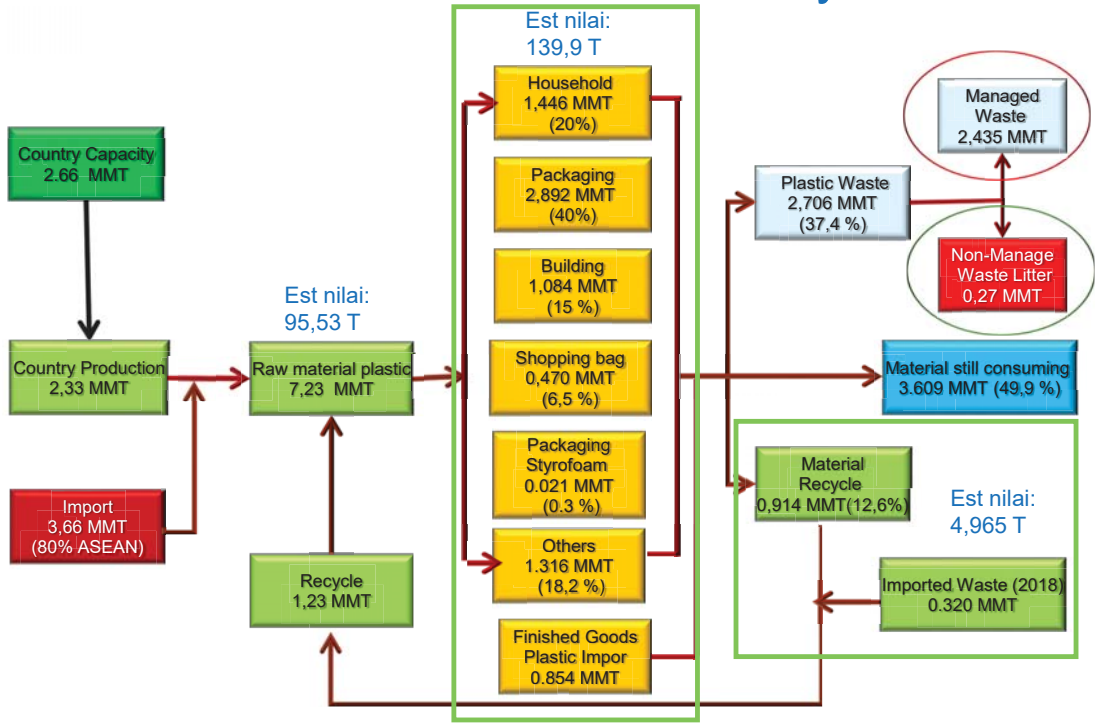


PLASTIC RECYCLING INDUSTRY



- Plastic recycling industry has an important role in meeting the needs of raw materials and increasing the competitiveness of the downstream plastic industry.
- The scavenger bases whose population is about 5 million people.
- Important role in the national economic circular, generating foreign exchange, and helping to reduce imports through product substitution.
- Is one of the solutions to the problems of plastic pollution.
- Production capacity reaches 2 million tons and absorbs 3.36 million workers (direct and indirect, including scavengers and collectors).

Indonesia Plastics Lifecycle



Sumber: Inaplas, UN Comtrade (diolah Kemenperin)

POTENTIALS OF PLASTICS RECYCLING INDUSTRY

- Improving The Economics and Quality of Plastic Recycling :
  - An increase in recycling rate can bring a significant contribution to towards environmental and economic benefits.
  - Better product design makes plastics recycling easier.
    - Higher usage of single material in packaging.
  - Collection and segregation of plastics waste to ensure quality inputs for the recycling industry.
  - Create a viable market demands for recycled plastics.

RECYCLING INDUSTRY CHALLENGES

- The government is helpless with the amount of garbage generated by its populations.
- The main cause is human behavior, not plastic products.
- The imposition of value added tax {VAT} which cannot be burdened by the recycling industry.
- The "waste management" system in Indonesia is not working well.
- The problem of collection n sorting (high cost, no infrastructure, etc). Collection and recycling systems are needed in many areas.

OTHER CHALLENGES

- “Green Washing”.
- What is “Environment-Friendly”.
- Single-use plastics → by definition & usage.
- Preventing plastic waste in our environment.
- A better understanding of plastics waste from government & public.
- Market demand for recycled products.

ADUPI

ADUPI

ASOSIASI DAUR ULANG PLASTIK INDONESIA

THANK YOU

LET'S DISCUSS

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Instagram : @adup.indonesia

WWW.ADUPI.ORG

Ocean Plastic Coalition

Turning marine waste into consumer goods

Ting- Fen Ho

財團法人塑膠工業技術發展中心

Plastics Industry Development Center

In Taiwan , 98% of enterprises in plastics industry are SMEs.

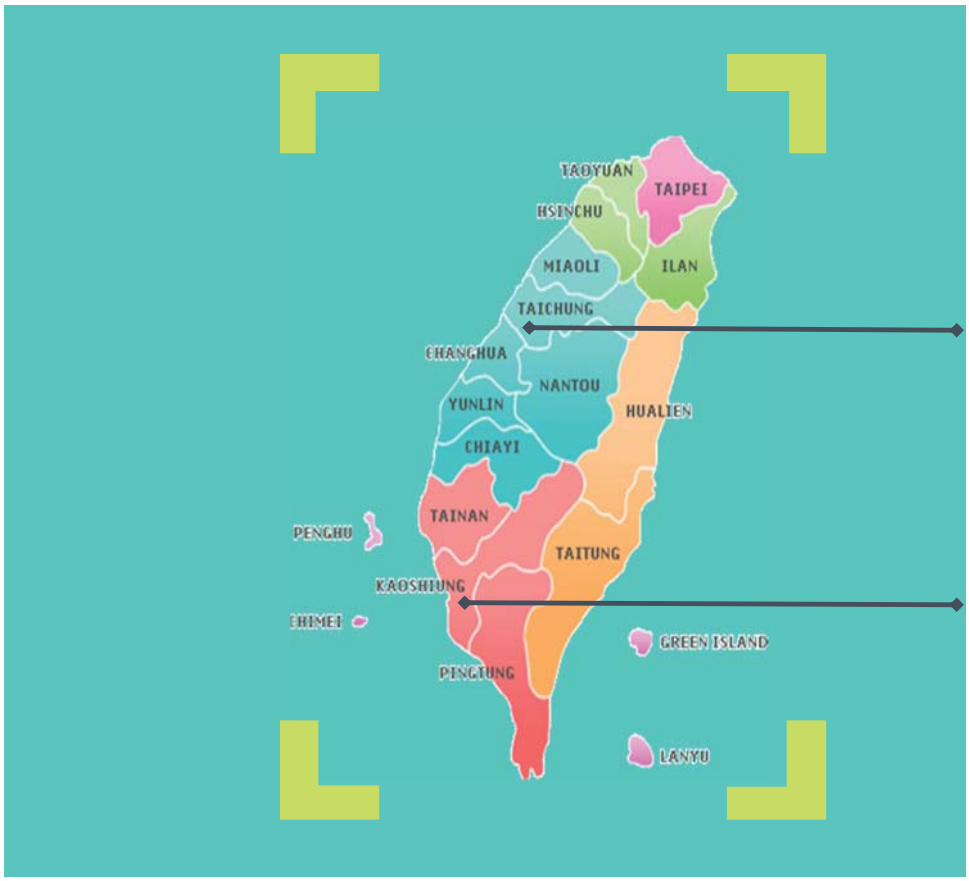
Plastics Industry
Development Center

Since 1993

Mission

Promoting the Plastic Industry

- To advance production technology.
- To improve R&D capabilities.
- To bridge international technological exchanges.



Location

Taichung

Industrial Park 38St.& 39 St.

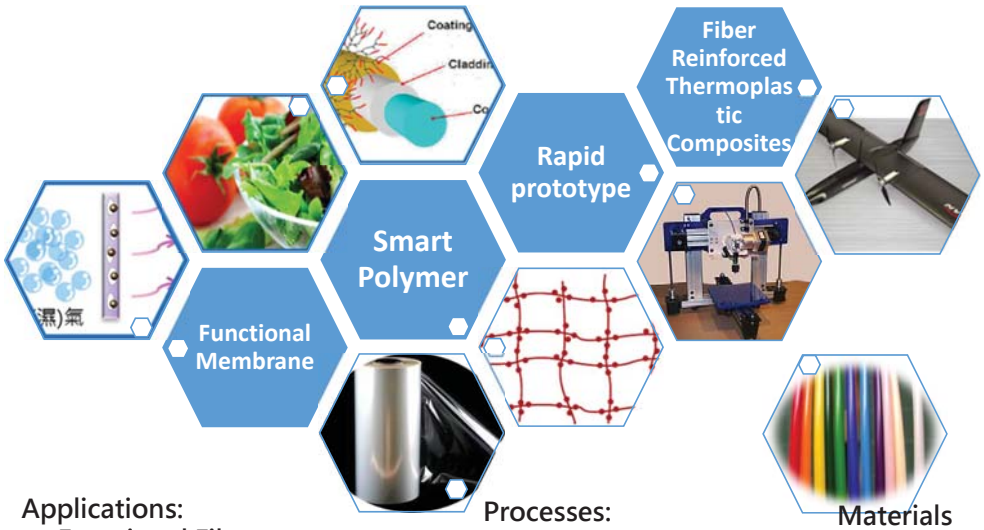
PIDC headquarters housing specialized laboratories, pilot plants and innovative teams of researchers and consultants.

Kaoshiung

R7 3D Printing Station

Learning and demonstrating hub for 3D printing techniques and applications.

Research & Development



Applications:
- Functional Film
- Smart devices & indicators
- LFT composites
- Fiber reinforced Thermoplastics Composites

Processes:
- FDM 3D printing device
- Fast RIM
- Fast RTM

Materials
- DCPD
- Smart adhesives
- FDM 3D printing materials

Inspection & Verification

Labroatory Accreditation

International Certification

Dr. P – Failure Analysis of Polymer Products

Departments

- Research & Development
- Inspection & Verification
- Sustainability Consulting
- Talent Training
- Biomedical Technology

Sustainable material space

Source: PlasticBank.com

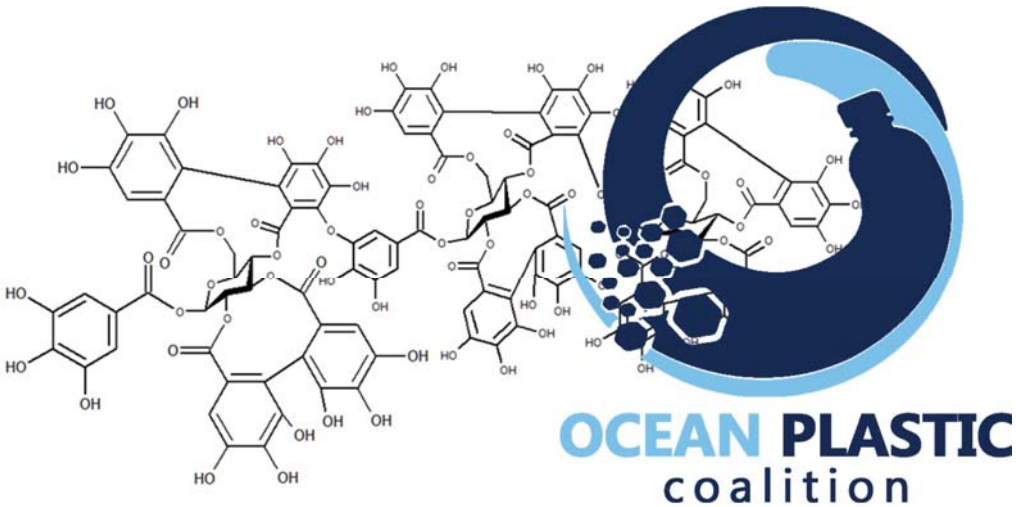
Ocean Litter Facts

80% of the marine litter is made of *plastics*. In Taiwan, it goes up to **89.6%.** 8 million tons of plastic waste being dumped into ocean every year.

46,000 piece of *plastic* are swirling in each square mile of our ocean

24,000 tons of *plastic* were ingested by fish in the middle depths of the northern pacific ocean

267 species around the world are harmed by *ocean plastic*. 86% of sea turtles, 44% of seabirds and 43% of sea mammals ingest of become tangled in *ocean plastic.*



OCEAN PLASTIC
coalition

Since 2018

About OPC

The Ocean Plastic Coalition is a coalition dedicated to all industries to which the health of our oceans matters. We raise awareness on marine plastic pollution and develop concrete industrial solutions to turn this pollution into a resource for the circular economy.

We turn ocean plastic waste into consumer goods to achieve a circular economy.

Members

And more…

Ocean Plastics

Fishery

EPS

ABS/ PVC

PE/ EVA/ PVC

Deep Sea

Off Shore

Ghost Net

PA6/ PE/ PET/ PP

Life

Objective 1

To promote the recycling of ocean plastic waste in the supply & demand chains.

The waste fishnet circular platform

【The connection】

Fisheries Agency
(COA)

EPA
(Executive Yuan)

IDB
(MOEA)

Fishermen

Fisheries Associations

Recycling companies

Plastic mfrs.

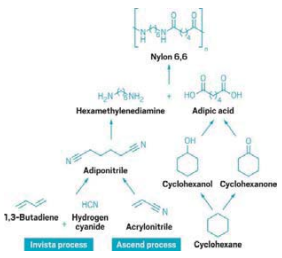
Waste fishnets → **Cleaning Sorting** → PA6, (PA6.6), PET, PE, PP

→ **Chemical re-make**

→ **Physical re-make**

The waste fishnet circular platform - chemical recycling

台灣化學纖維股份有限公司
FORMOSA CHEMICALS & FIBRE CORPORATION



Objective 2

To develop design and technical capabilities to convert waste plastics into consumer goods.

Material acquirement > Producing & manufacturing > Transportation > Consumer usage > Recycled processing

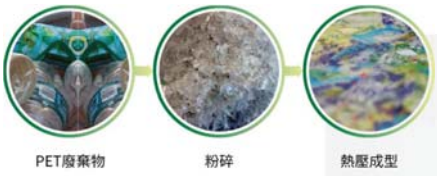
Sustainable DESIGN LAB

- Extend product life / Reduce/ Reuse/ Repair/ Remanufacture/ Recycle
- Aesthetics/ Function

2017 Project /

Ocean Plastic Sunglasses

From Beach to Bag



From Fishnet to Sunglasses

廢棄漁網蒐集
Gathering of waste fishnets

清洗去除雜質
Cleaning and ridding impurities

熔融造粒
Net-melting and granulating into pellets

模具射出
Injection molding

Sustainability

Each pair of glasses reduce 180g ocean plastic.

Make an ocean pledge, keep our ocean clean!

Exhibition

2018 Project /

Recycled Plastic Fountain Pens

From
PET bottle
To Fountain Pens

From
Styrofoam (Polystyrene)
To Fountain Pens

Green To Packaging

Black-face Spoonbill Fountain Pen.

2019 Launch!

2019 Project /

Eco Travel

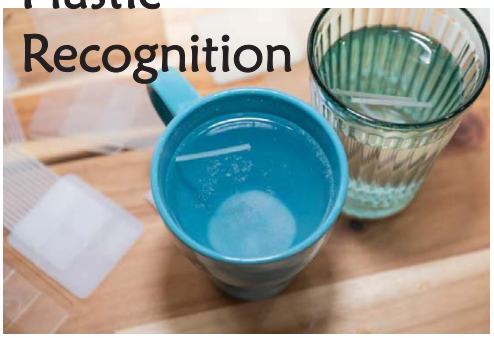
台灣潛水

OCEAN PLASTIC coalition

Bring Ocean to your life

Training Course

Plastic Recognition



Environmental Education Event

書屋 紅氣球
LE BALLON ROUGE

A Travel Kit That Speaks

Objective 3

To develop advanced technology which creates a recycling cycle of ocean plastic waste.

Sign up for Corporate Visit Tour with us. (2020 April)

Thank you!

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財團法人塑膠工業技術發展中心
Plastics Industry Development Center