



Status and Policy of Circular Economy in Taiwan

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Strategies and direction

Circulation of plastic

Conclusion





Strategies and direction



Promoting Background

➤ Responding to International Trends

- The European Union (EU) has approved the idea of carbon tariffs on products from overseas due to the incoming **net zero carbon emissions era**.
- Requirements of the recycled materials proportion in products have gradually increased in many countries.

➤ Reducing Environmental Pressure

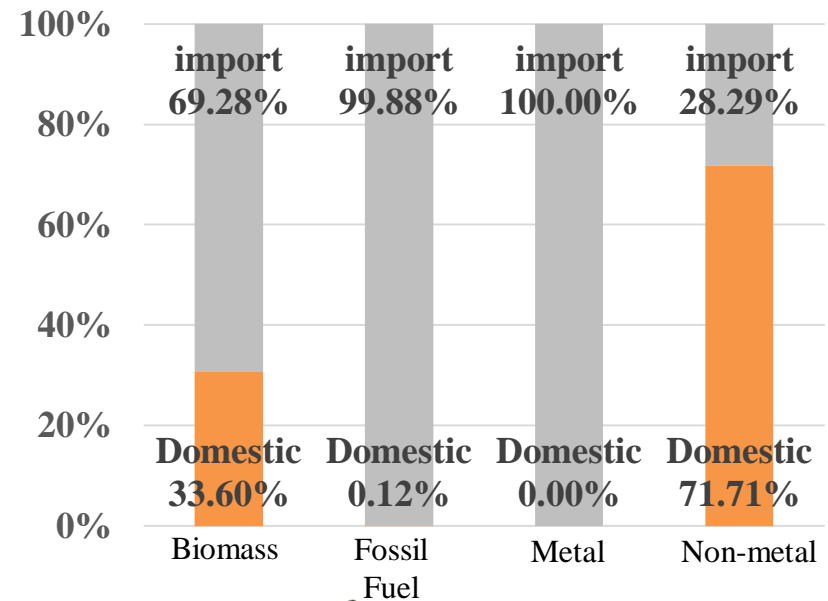
- Small territory and high population density of Taiwan cause the high environmental pressure for the country.
- Efficient intermediate processing needs to be developed for the limited capacity and expanding difficulties of the disposal facilities.

➤ Forming Business Models

- New business model has gradually formed thanks to the collaboration the industries, government agencies, academia and research organizations in Taiwan.
Ex: **Product-as-a-Service** and **Leasing**.

Status Description

- In Taiwan, **76%** of materials are imported. In 2019, approx. **325Mt** of materials were used.
 - Excluding materials that were processed and exported again, **247Mt** materials were consumed domestically.
 - Avg. **10.48tonnes** consumed per capital annually. (Mt=million tonnes)
- Since 1997, the Taiwan EPA has initiated a **“4-in-1 Resource recycling program.”**
 - The system of the program raised the recycling rate to **58.84%** in 2020.



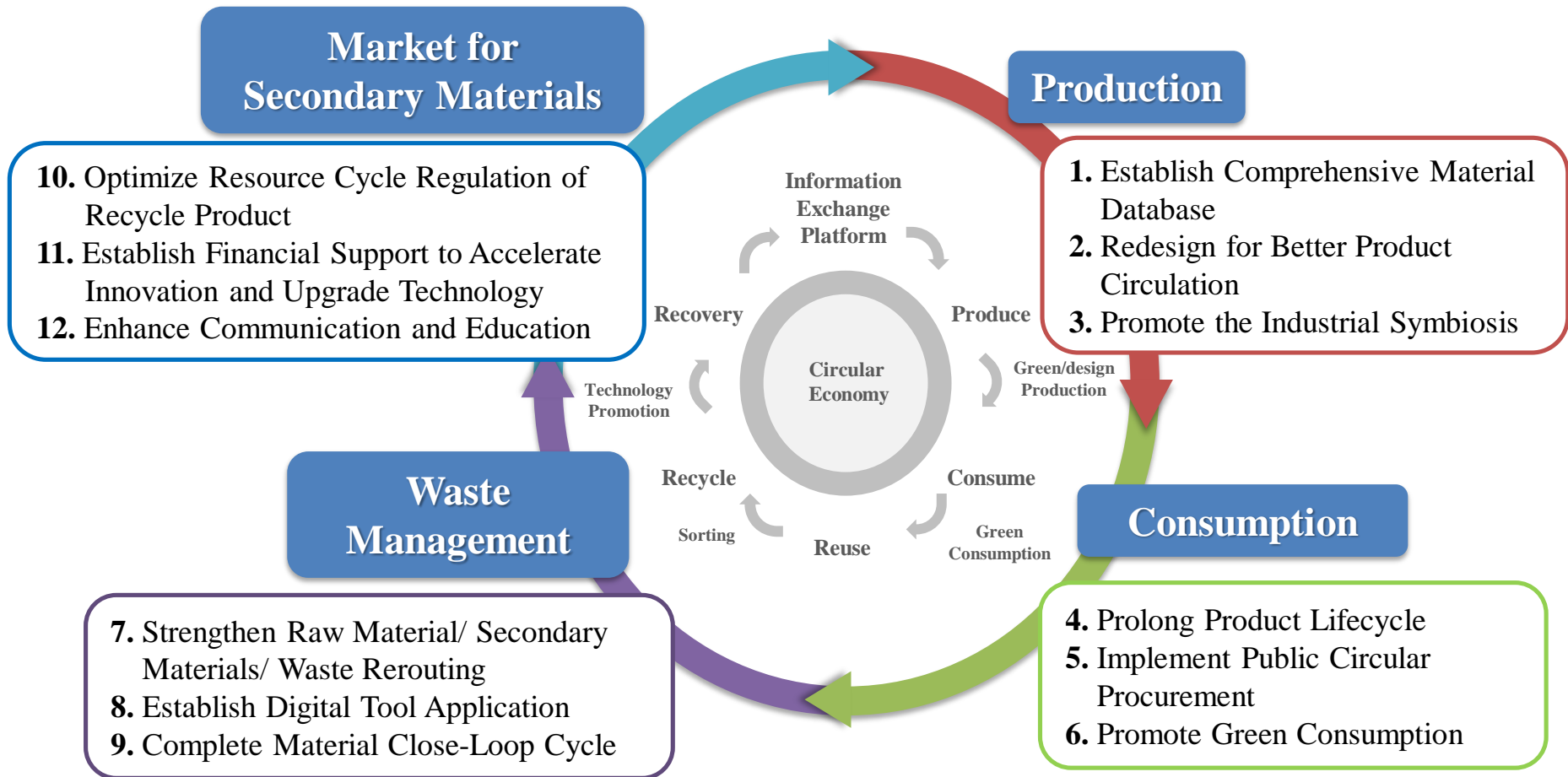
Establish a coordination mechanism between government departments

- According to Article 5 of *Resource Recycling Act*, EPA establish a Renewable Resource Recycling and Reuse Promotion Committee (herein referred to as “the Committee”) responsible for :
 - The review of major policies and measures on the recycling and reuse of renewable resources as drafted by the competent authority and industry competent authority.
 - The coordination and assessment of implementation and operational matters as related to items officially announced and designated in each article of the Source Management Chapter of this Act.
- The "Resource Recycling and Reuse Promotion Plan" has been established in phases as the promoting basis of the Committee and implemented by several Ministries of Taiwan.

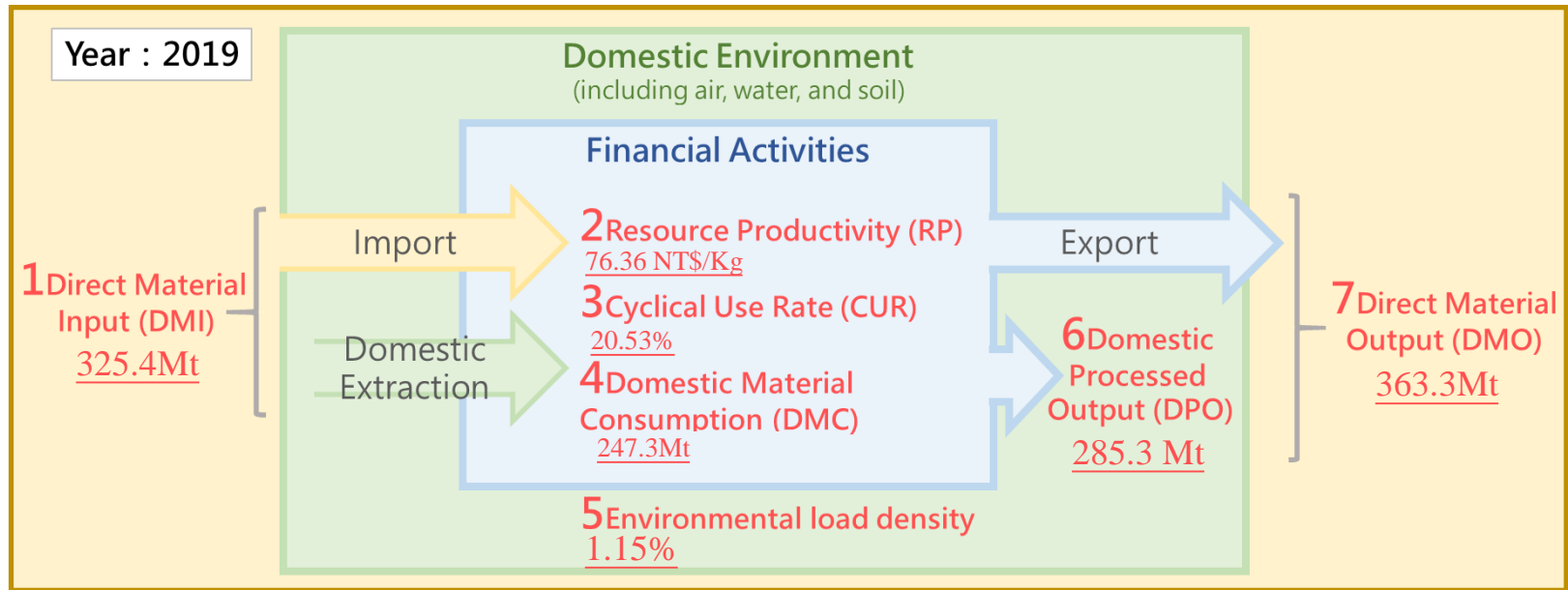
*The Plan has been renamed as the Resource Circulation Action Plan in 2020

Resource Circulation Action Plan

- To achieve the goals of **maximizing resource efficiency** and **minimizing environmental impacts**, 12 promotion strategies in 4 aspects and 4 key performance indicators are used.



Resource Circulation Analysis System



Biomass

Import	Domestic
Cereals	Vegetables
7.0 Mt	2.8 Mt
Timber (industrial round wood)	Fruits
5.0 Mt	2.5 Mt
Oil-bearing crops	Cereals
3.1 Mt	2.0 Mt

Fuel

Import
Coal
68.2 Mt
Crude oil
56.9 Mt
Natural gas
18.6 Mt

Metal

Import
Iron
35.5 Mt
Copper
1.1 Mt

Non-metal

Import	Domestic
Limestone and gypsum	Sand and gravel
4.0 Mt	52.3 Mt
Salt	
3.3 Mt	
Sand and gravel	
2.0 Mt	

Unit: Mt = million tones

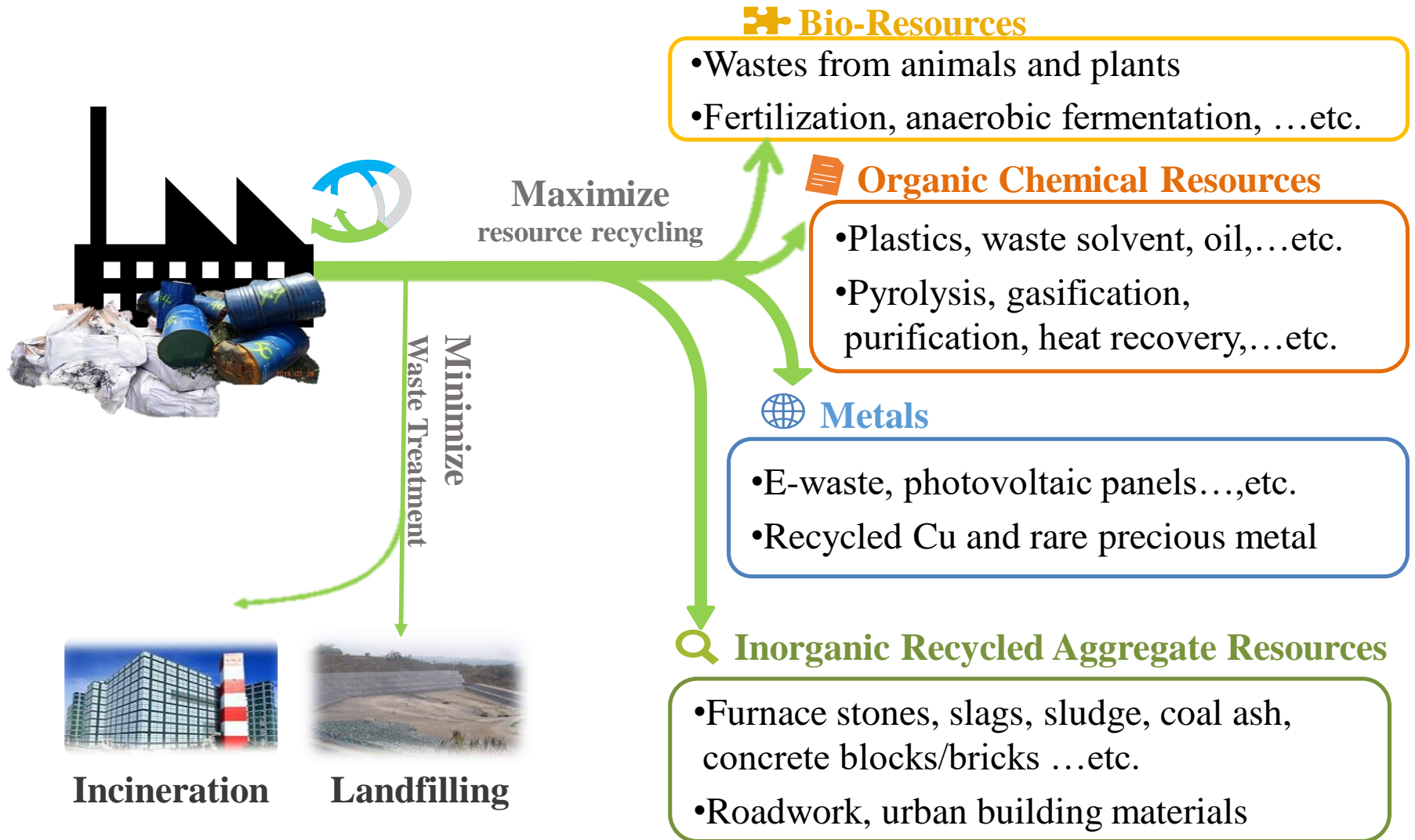
Key Performance Index

Section	Index		2019	2018	2019	2020
Production	Resource Productivity		76.36	67.2	68.3	69.4
Consumption	DMC* per capita		10.48	10.8	10.6	10.4
Waste management	Incineration and landfill reduction rate	General waste	-11.3	3%	5%	7%
		Industrial waste	0.4	1%	2%	3%
Secondary raw materials	Cyclical Use Rate		20.5	16.0	16.5	17.0

Goal values

*DMC : Domestic Material Consumption

Cyclic Resource Management Framework



Credit to: Professor Zu-En Zhang, National Cheng Kung University

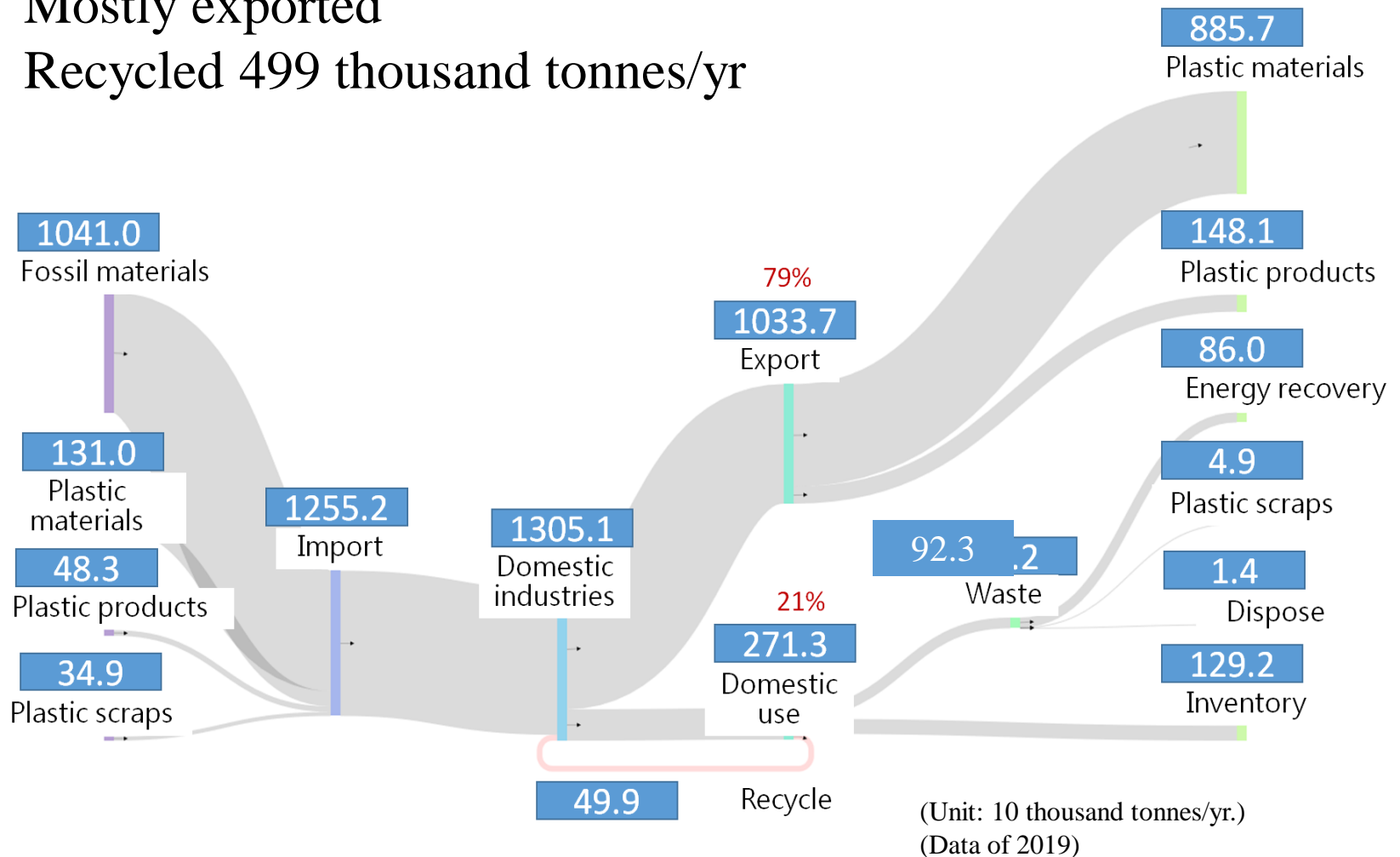


Circulation of plastic



Flow chart of plastics in Taiwan

- Mostly exported
- Recycled 499 thousand tonnes/yr



Strategies

- Increase the amount of recycling
- Increase the added value of recycling
- Establish verification mechanism for recycled plastic

Action

1. Require all plastic packaging to be recycled
2. Establish alliances to reduce plastic waste and increase recycling
3. Develop new markets with innovative technology
4. Establish verification mechanism for recycled plastic
5. Reduce the use of plastic packaging

Action 1 -Require all plastic packaging to be recycled

Characteristic	 <p>Containers announced for recycling</p>	 <p>Others available for recycling</p>	 <p>Not available for recycling</p>
Management	<ul style="list-style-type: none">• Guide by laws<ul style="list-style-type: none">①Change sales pattern②alternative materials or business model③adjust living habit	<ul style="list-style-type: none">• Collected and recycled to produce secondary materials to create new recycling value• Establish a communicated platform to assist promoting recycling	<ul style="list-style-type: none">• Incineration with general waste• Make SRF for high-efficiency energy recovery in industrial boilers

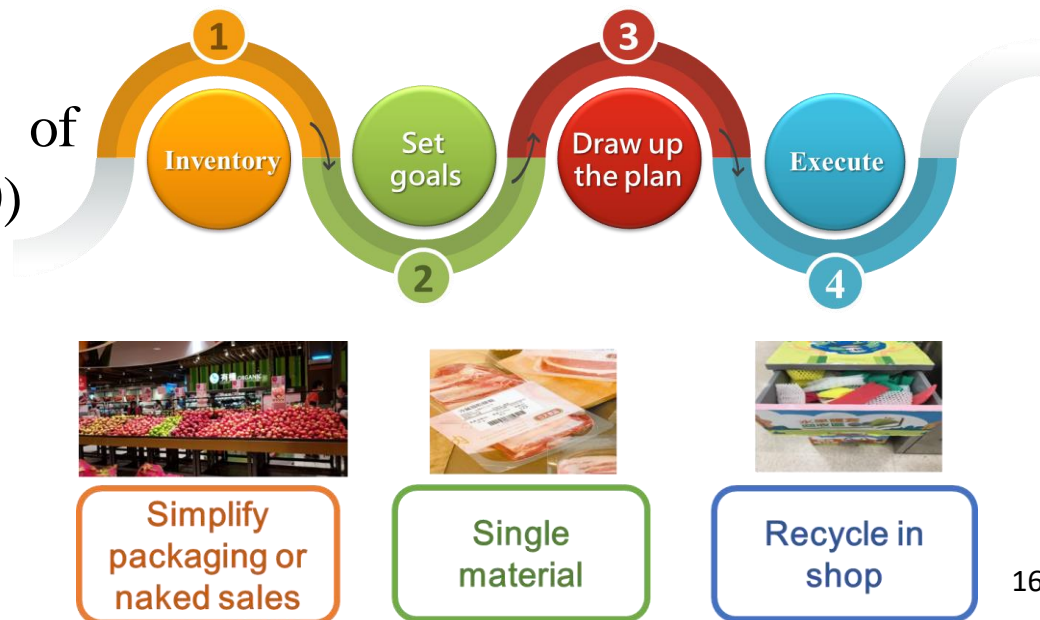
Action 2 –Establish alliances to reduce plastic waste and increase recycling

- ◆ Promoted the recycling of pallet and made it into garbage bags for use in retail stores (2019)



- ◆ Establish circulation model of retail plastic packaging (2020)

- ✓ Innovative business model
- ✓ Recycle
- ✓ Change packaging material



Action 3 –Develop new markets with innovative technology

➤ Green design

- Easy to disassemble, modularization and easy to recycle design
- Reduce the use of raw materials or harmful substances
- Use recycled material and renewable resources

➤ Alternative material



Dec 21, 2017



Jan 23, 2018



Feb 21, 2018



Apr 23, 2018

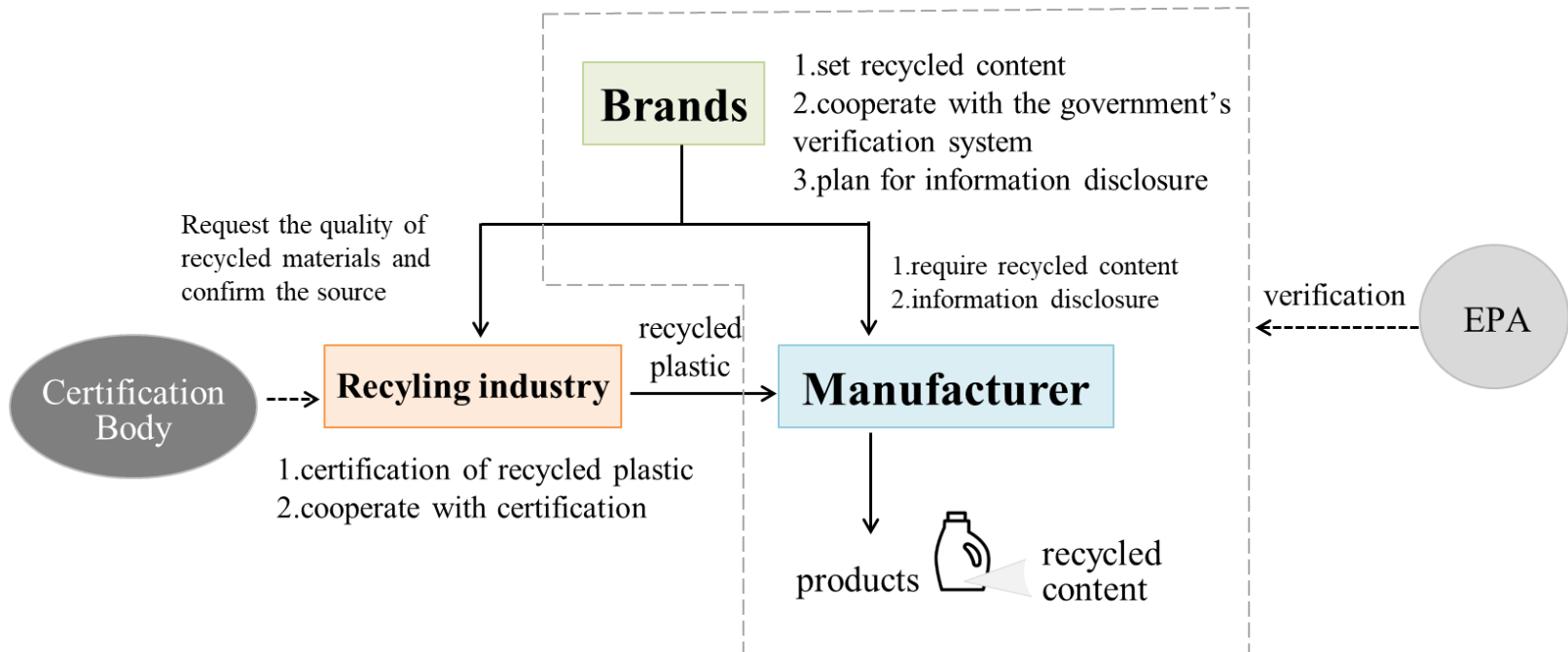
Agriculture
film (PLA)

Decomposition

Action 4 –Establish verification mechanism for recycled plastic

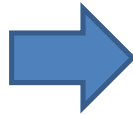
- Priority is given to voluntary methods, gradually achieved target of recycled content in accordance with legal requirements.

Set goal of recycled content ➡ certification ➡ information disclosure ➡ verification



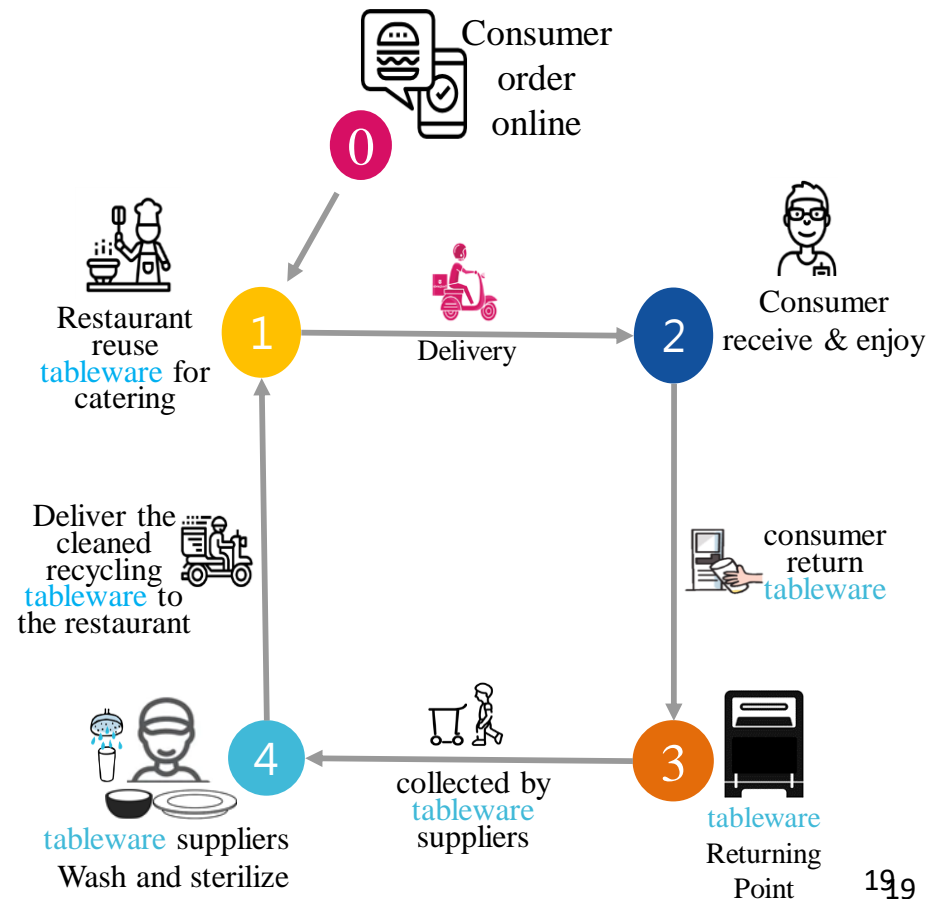
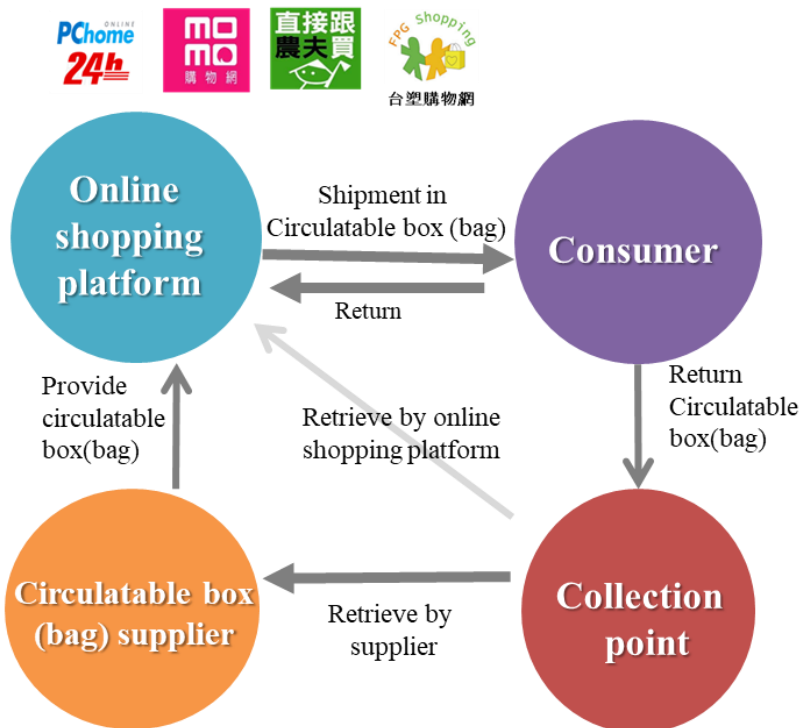
Action 5 –Reduce the use of plastic packaging

➤ Guide by laws



1. Change sales pattern
2. Alternative materials or business model
3. Adjust living habit

- Circulation box(bag) for online shopping
- replace single-use packaging





Conclusion



Conclusion

- EPA will keep improving regulations, establishing innovative business models to drive production with consumption and provide market incentives, and networking manufacturing and recycling industries.
- Hopefully, move forward to the goals of increasing the resource efficiency and the integration of energy and resource effective use.



Law

Market

Innovation

Network