



 **LiB CONSULTING** 1 0 0 年 後 の 世 界 を 良 く す る 会 社 を 増 や す

# Plastic Recycling Market Research in Thailand

Interview report

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# About the project



**Project** : Plastic Recycling Market Research in Thailand

**Background** : NEDO is planning to **solve the issues** happening in the plastic recycling market in Thailand **by giving supports to Japanese companies** who can be potential solution providers

## Objectives of this project

- (a) To get insights about current plastic recycling situation in Thailand
- (b) To identify the issues that are occurring in the plastic recycling map
- (c) To determine potential solutions that NEDO could implement to solve the issues

# LiB Consulting is the number one consulting firm specializing in increasing top-line revenue and bottom-line profit

## No. 1 Consulting Firm specializing in increasing top-line revenue and bottom-line profit

### We have world-class best practices in growth strategy and cost optimization

#### Different layers



#### Various industries

Strategy

System

Organization

Personnel



Consumer Products



Food & agriculture



Healthcare Systems & Services



Real Estate



E-Commerce



Banking & finance



Retails



Telco



Logistics

### Extensive experience in building system and execution

Operation tools

Execution tools

PDCA tools

Organization system

Visualization

Motivation Management

Organization development  
i.e. reward system, evaluation system

### More than 600 consulting projects worldwide

**600+** consulting projects worldwide



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# LiB has approached various government departments and corporate industries to maximize the quality of interview results for the project

1

## Government interviews

- Thailand Institute of Packaging and Recycling Management for Sustainable Environment (TIPMSE)
- Department of Industrial Works (DIW)
- 3 Academic professors

2

## Corporate interviews

- Automotive
- Electronic appliances
- Food and beverages
- Plastic producer
- Waste management/recycling

# Five interviews with both government organizations and academic professors were conducted

1

Government interviews

## Objectives

- (a) To **validate as-is and to-be facts** collected by desktop research
- (b) To **validate recycling process map**
- (c) To **identify issues** occurring along the recycling map
- (d) To **gather solution** ideas to solve the issues in the recycling map

## Type

## Organization

## Position

### Government organization

**Thailand Institute of Packaging and Recycling Management for Sustainable Environment (TIPMSE)**

- Deputy Director and Acting Director

**Department of Industrial Works (DIW)**

- Director of Industrial Permit Services Division 1

### Academic professors

**Environmental Research Institute at Chulalongkorn University**

- Senior researcher
- Researcher

**Petroleum and Petrochemical College at Chulalongkorn University**

- Professor



# Moreover, interviews with 14 large private Japanese and Thai corporates were also conducted to obtain factual insights

2

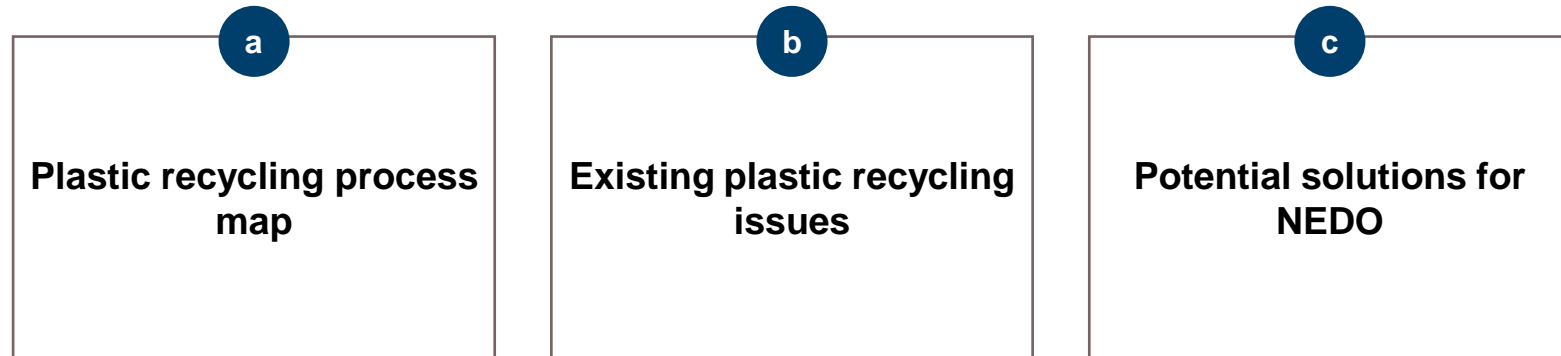
Corporate interviews

## Objectives of the interview

- (a) To gather information about **private companies' goals and actions in the plastic recycling chain in Thailand**
- (b) To gather opinions on private companies' **willingness to solve the existing issues** in the plastic recycling chain
- (c) To **gather solution** ideas to solve the issues in the recycling map

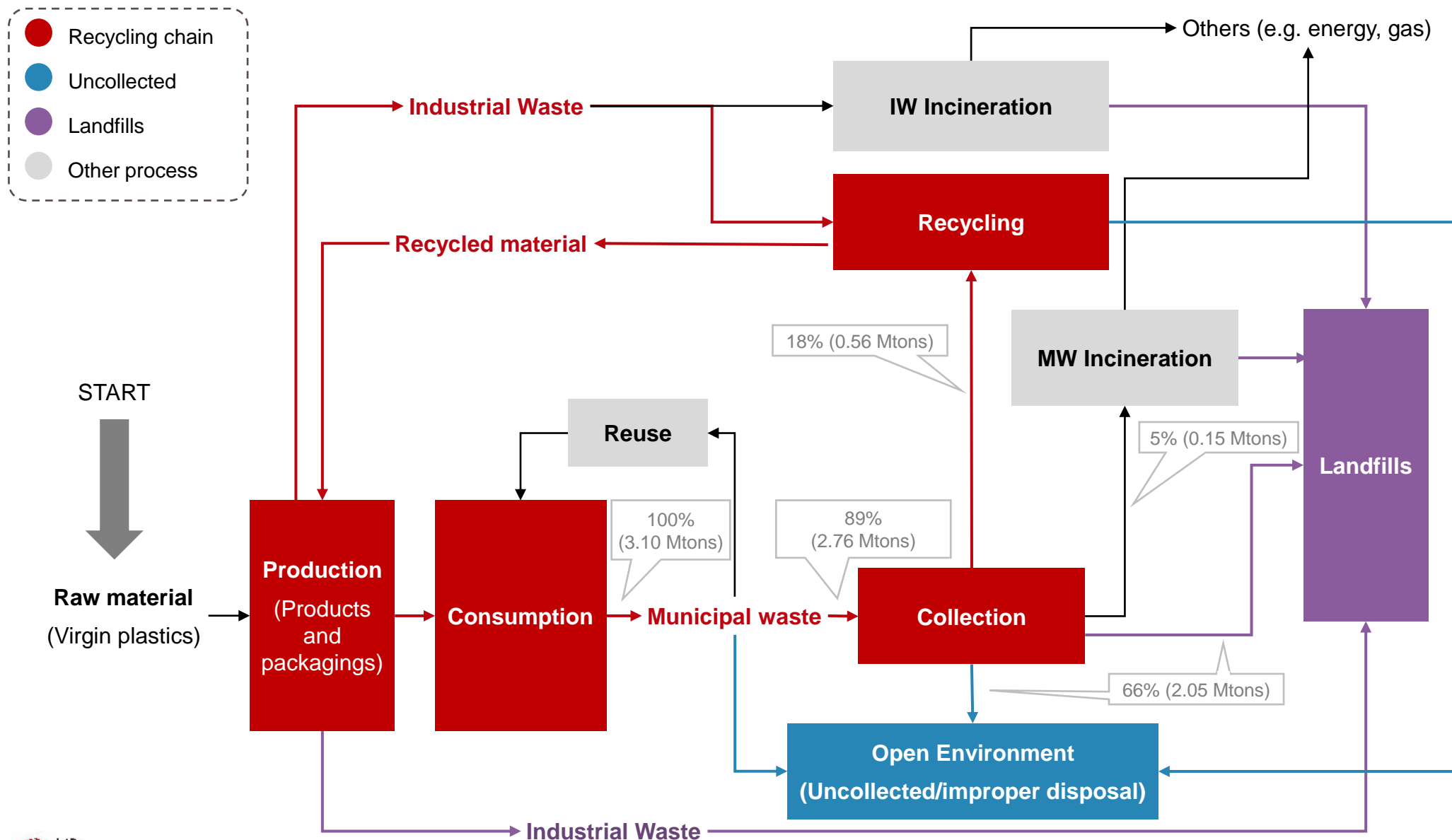
Industry	No. of companies	Position
Electrical appliances	<ul style="list-style-type: none"><li>• 3 Japanese companies</li></ul>	<ul style="list-style-type: none"><li>• General Managers</li><li>• Manufactured System Engineers</li></ul>
Automotive	<ul style="list-style-type: none"><li>• 3 Japanese companies</li><li>• 1 Thai company</li></ul>	<ul style="list-style-type: none"><li>• Vice President</li><li>• General Managers</li><li>• Sustainability Development Managers</li></ul>
Food and beverages	<ul style="list-style-type: none"><li>• 1 Japanese company</li></ul>	<ul style="list-style-type: none"><li>• Vice president</li></ul>
Plastic producer	<ul style="list-style-type: none"><li>• 1 Japanese company</li><li>• 2 Thai companies</li></ul>	<ul style="list-style-type: none"><li>• Chief Operating Officer</li><li>• Sales Vice President</li><li>• Managing Director</li></ul>
Waste management / recycling	<ul style="list-style-type: none"><li>• 1 Japanese company</li><li>• 2 Thai companies</li></ul>	<ul style="list-style-type: none"><li>• Managing Director</li><li>• Division General Manager</li><li>• President</li></ul>

# The interview results can be divided into three major parts: plastic recycling process map, existing plastic recycling issues, and potential solutions for NEDO



# Some part of both consumption (municipal) and production (industrial) waste are collected for recycling

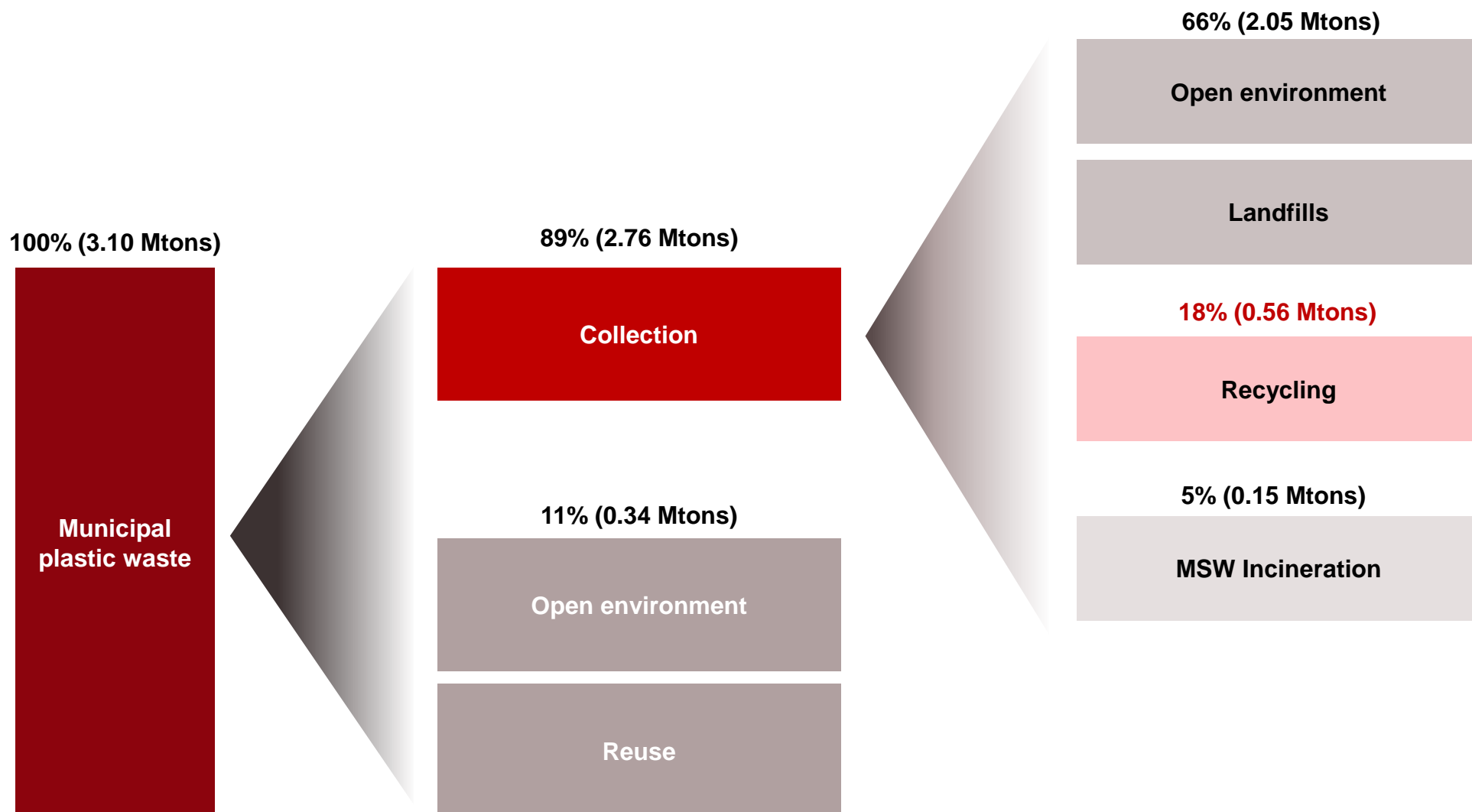
## a Plastic recycling process map



# However, only 18% of the total municipal plastic waste was recycled in 2021 although 89% was collected

a

Plastic recycling process map



# According to the government interview, we have discovered eight critical problems in the municipal waste aspect

b

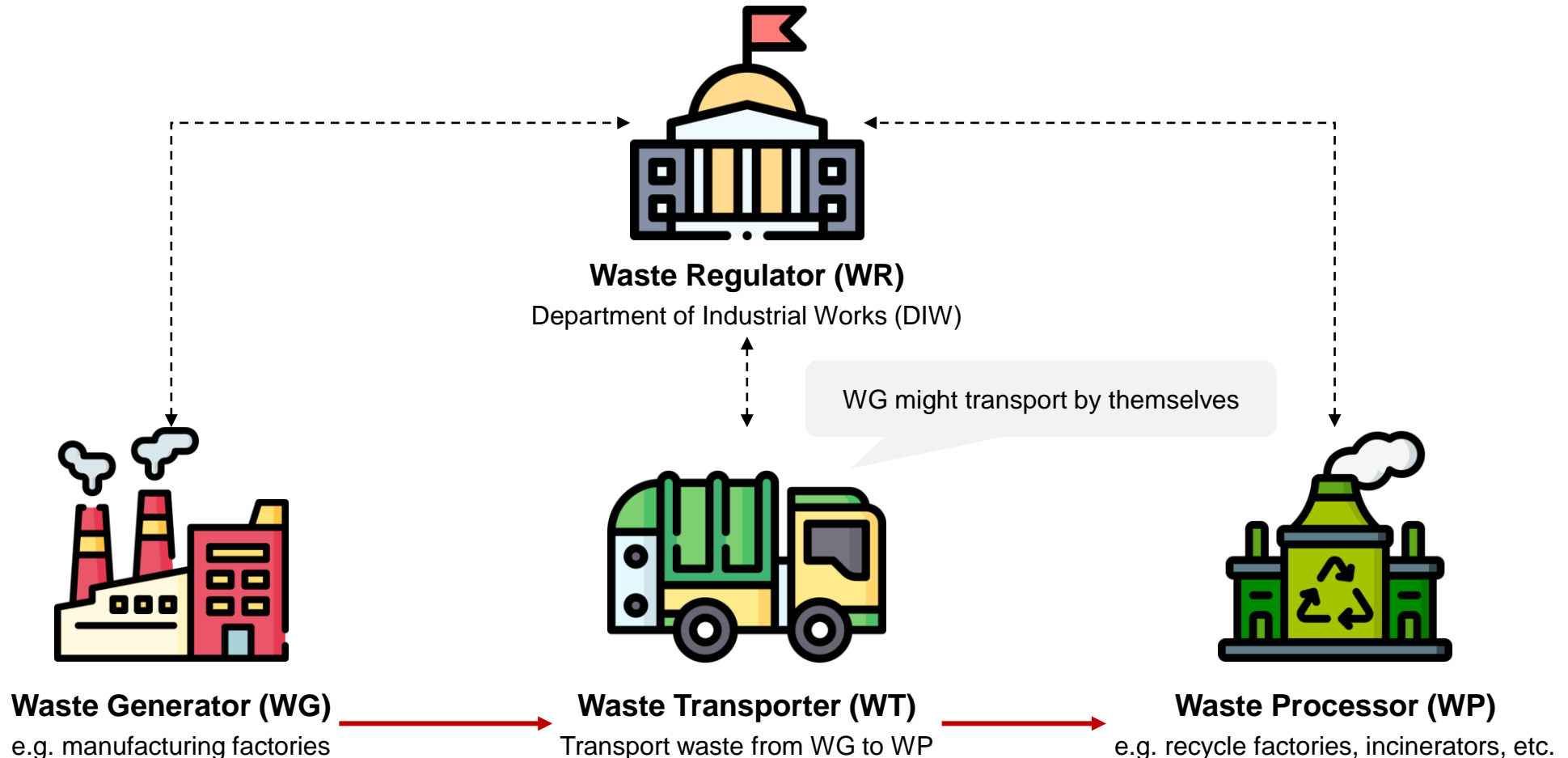
Existing plastic recycling issues

Municipal waste issues	Definition
<b>(1) Poor collection</b>	General waste is mismanaged/improperly disposed/leakage during collection, resulting in high amount of uncollected waste
<b>(2) Poor sorting</b>	General waste is not sorted properly due to <ul style="list-style-type: none"> <li>• Consumer behavior</li> <li>• Inefficient sorting system</li> <li>• Lack mandatory extended producer responsibility</li> </ul>
<b>(3) Lack advanced technology in recycling</b>	Recycling factories avoid investment in advanced recycling technology due to lack of fundings and low value-added of processed materials
<b>(4) Inconsistent or insufficient supplies for recycling</b>	Plastic waste is not enough for recycling in each period
<b>(5) Low quality recycled material</b>	Processed materials from recycling has low quality due to the contamination of waste that recycling factories received
<b>(6) Poor management on pollution after recycling process/accidents</b>	Recycling process creates pollution and often creates flame accidents in Thailand
<b>(7) Limited capacity on type of plastic recycle</b> (only PET, HDPE, PP)	There are only three main types of plastic that are recycled in Thailand, but other types are not recycled due to poor management
<b>(8) Limited demand for recycled plastic materials</b>	Manufacturing companies has low demand for recycled plastic materials as the quality is low and cost is high compared to virgin plastics

# On the contrary, WG are required look after the industrial waste they generated until completely processed

→ Industrial waste flow

← - - - → Get approvals / licenses

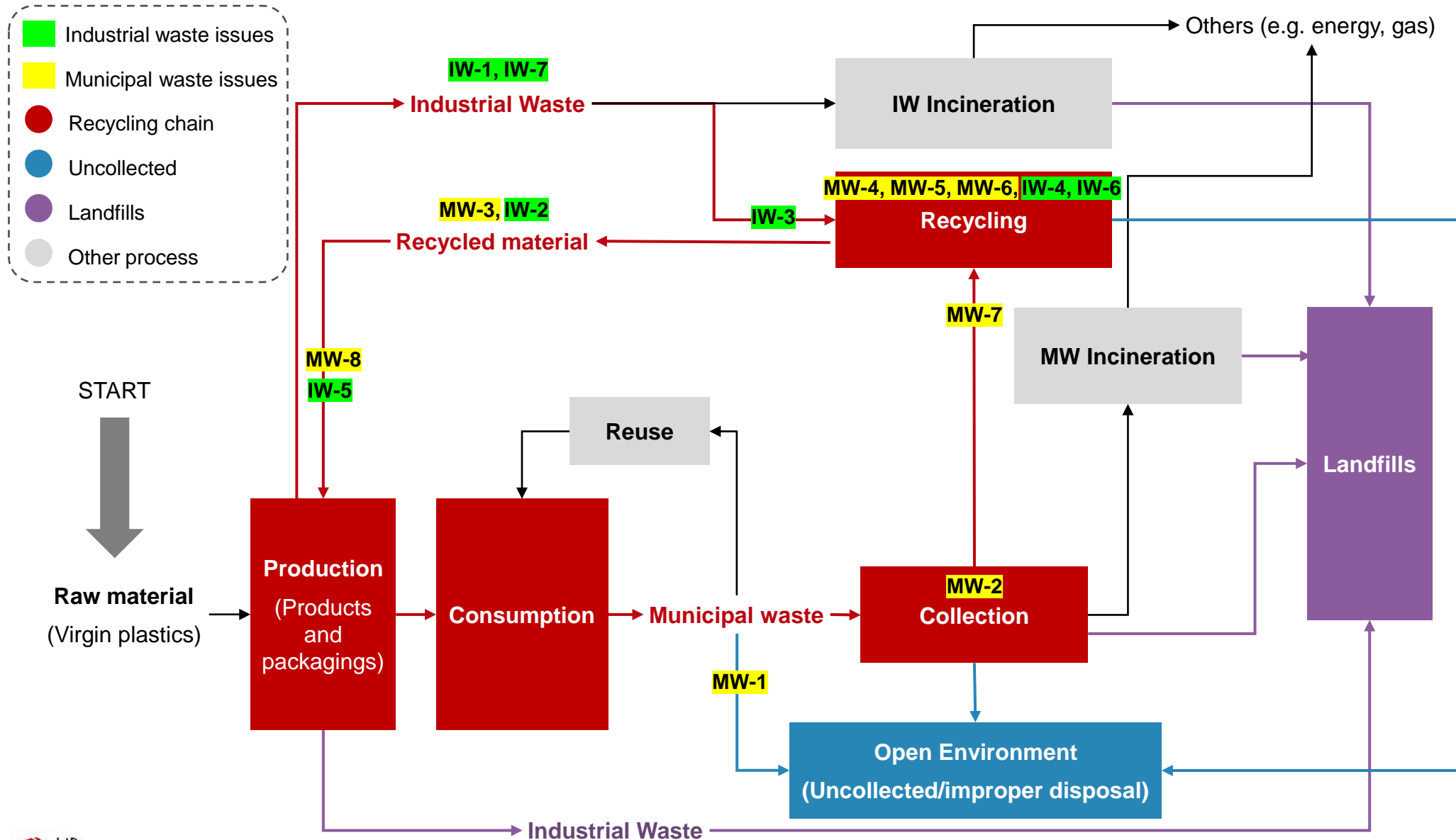


# Still, seven major industrial waste issues exist

Industrial waste issues	Definition
<b>(1) Lack effective system for data collection and analysis</b>	Waste generators and waste regulators do not have an effective data collection and analysis to manage industrial waste efficiently
<b>(2) Poor sorting</b>	Industrial waste is not sorted properly due to <ul style="list-style-type: none"><li>• Lack know-how or tools for sorting</li><li>• Lack strict mandatory regulations on waste sorting</li></ul>
<b>(3) Lack advanced technology in recycling</b>	Recycling factories avoid investment in advanced recycling technology due to lack of fundings and low value-added of processed materials
<b>(4) Inconsistent or insufficient supplies for recycling</b>	Plastic waste is not enough for recycling in each period
<b>(5) Low quality recycled material</b>	Processed materials from recycling has low quality due to the contamination of waste that recycling factories received
<b>(6) Limited capacity on type of plastic recycle</b> (only PET, HDPE, PP)	There are only three main types of plastic that are recycled in Thailand, but other types are not recycled due to poor management
<b>(7) Limited demand for recycled plastic materials</b>	Manufacturing companies has low demand for recycled plastic materials as the quality is low and cost is high compared to virgin plastics

# The issues can be mapped along the flows of the plastic recycling process map

## b Existing plastic recycling issues





# Eight potential solutions were designed according to the rank of criticality of the issues

c

Potential solutions for NEDO

## Potential solutions

(1) Partnership with law-drafting team and support on webinars for waste regulators

(2) Partnership with Japanese companies to be educational providers to private companies/ consumers

(3) Support technology/ innovation/ know-how for “Waste sorting, cleaning, or collecting”

(4) Support technology/ innovation/ know-how for “Recycling”

(5) Material recovery facility

(6) Producer Responsibility Organization (PRO)

(7) Online matching platform

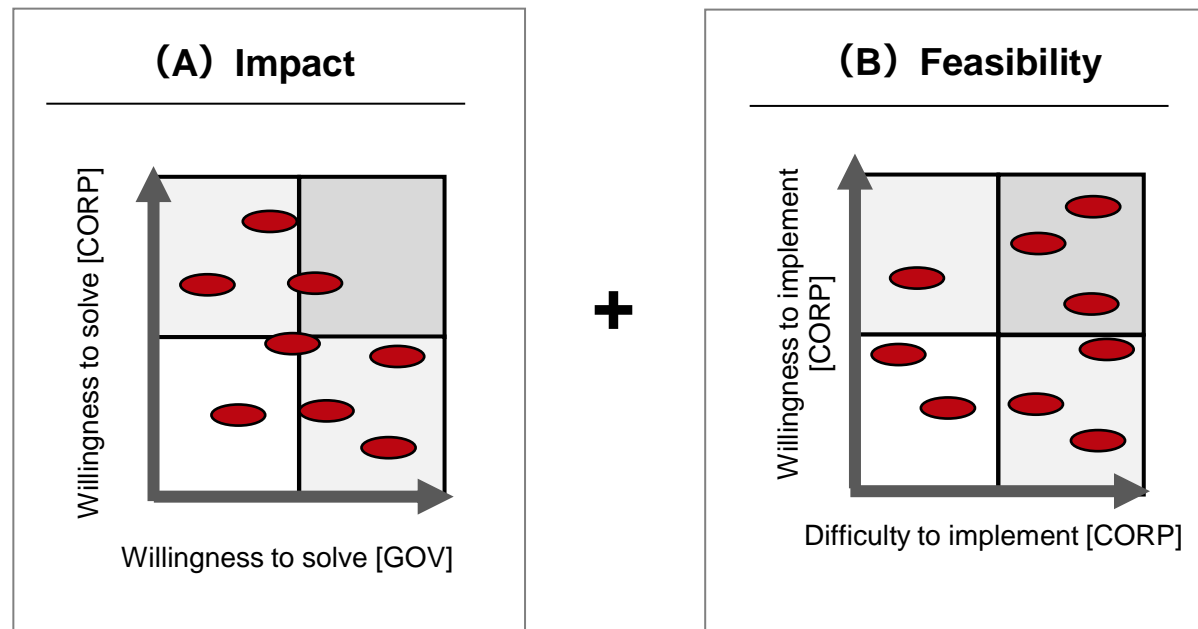
(8) Data collection and analysis tools

# Both impact and feasibility will be considered in prioritizing solutions for NEDO

c

Potential solutions for NEDO

## Prioritizing solutions to be solved



# High-priority solutions will be selected according to the results for the creation of solution model

c

Potential solutions for NEDO

## High-priority solution evaluation result from each industry

Solution name	Industry					
	Electrical appliance	Automotive	Food and beverage	Plastic producer	Waste management	All industries
(1) Partnership with law-drafting team and support on webinars for waste regulators	○	○	△	○	△	○
(2) Partnership with Japanese companies to be educational providers to private companies/ consumers	△	○	△	△	△	△
(3) Support technology/ innovation/ know-how for <u>“Waste sorting, cleaning, or collecting”</u>	△	△	△	○	△	△
(4) Support technology/ innovation/ know-how for <u>“Recycling”</u>	□	△		○		△
(5) Material recovery facility	△	○	△	△	△	△
(6) Producer Responsibility Organization (PRO)		○	△	△	△	△
(7) Online matching platform	△	○		○	○	○
(8) Data collection and analysis tools		○	□	△	△	△

○ = High-priority area for both **“Impact”** & **“Feasibility”**

△ = High-priority area for only **“Impact”**

□ = High-priority area for only **“Feasibility”**

Blank = does not fall in any high-priority areas

# Solution 3,4 – Support technology/ innovation/ know-how for “Recycling”

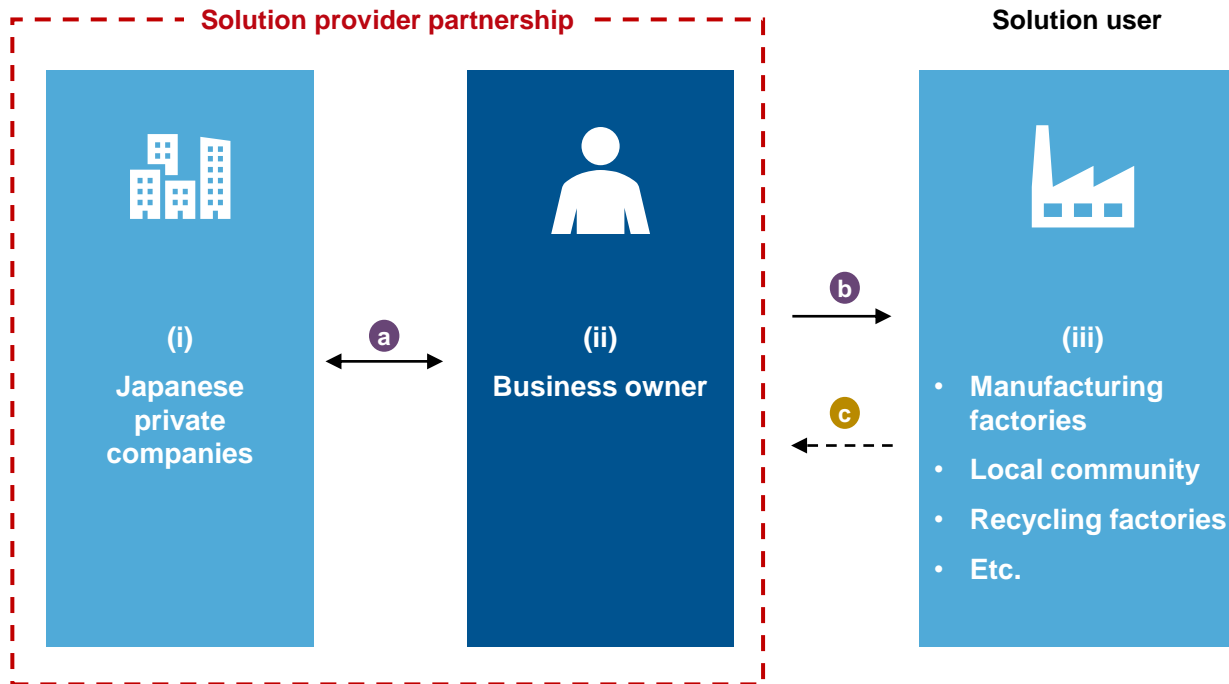
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Potential solutions for NEDO

## Goal

- To get higher quality supplies to produce higher quality recycled material
- To get higher value of recycled material from the increase in quality level

## Solution model hypothesis



Remark: Japanese companies can join all parts of the solution model

## Explanation



### Roles

- (i) Transfer technology and know-how
- (ii) Facilitate the transfer of technologies and know-how [e.g. knowledge sharing programs]
- (iii) Receive supports for technologies and know-how transfer



### Activities

- (a) Partner for technology and know-how transfer
- (b) Transfer technology and know-how for waste sorting, cleaning, collecting, and recycling

### Examples



- Reversed vending machine



- Chemical recycling



### Cash flow

- (c) Licensing fees/ training fees/ consulting fees

# Solution 5 – Material recovery facility

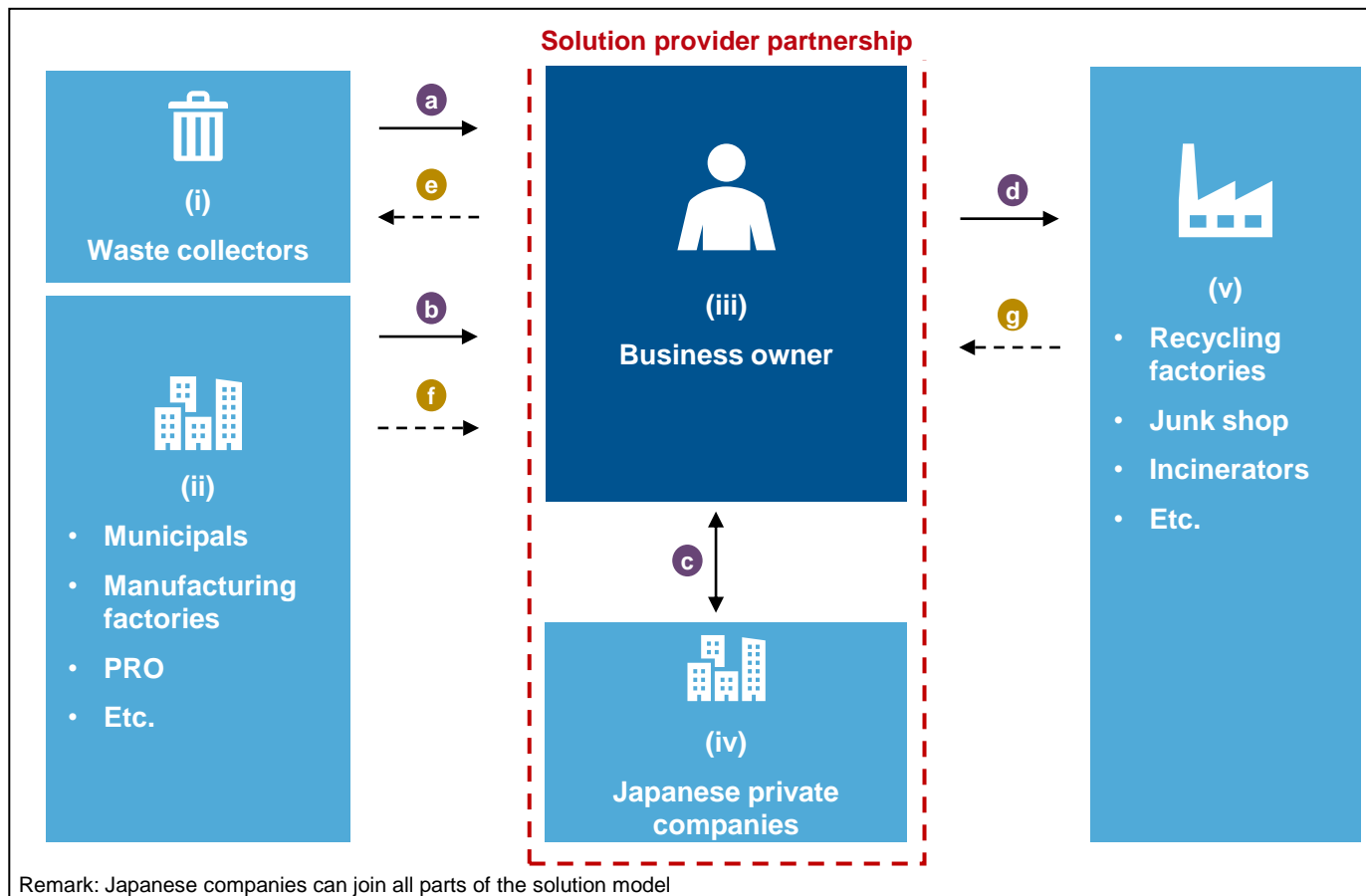
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Potential solutions for NEDO

## Goal

- To get higher quality supplies to produce higher quality recycled material
- To maximize the quantity of recyclable materials

## Solution model hypothesis



## Explanation



### Roles

- (i) Collect mismanaged waste for MRF
- (ii) Send their waste to MRF
- (iii) Establish MRF and oversee day-to-day operations
  - Clean MRF = Industrial waste MRF
  - Dirty MRF = Municipal waste MRF
- (iv) Transfer technology and know-how
- (v) Buy sorted waste from MRF



### Activities

- (a) Send mismanaged waste
- (b) Send their mixed waste
- (c) Partner for technology and know-how transfer
- (d) Deliver sorted waste



### Cash flow

- (e) Pre-payment collection fee/wage
- (f) Operational fee
- (g) Waste sales revenue

# Solution 7 – Online matching platform

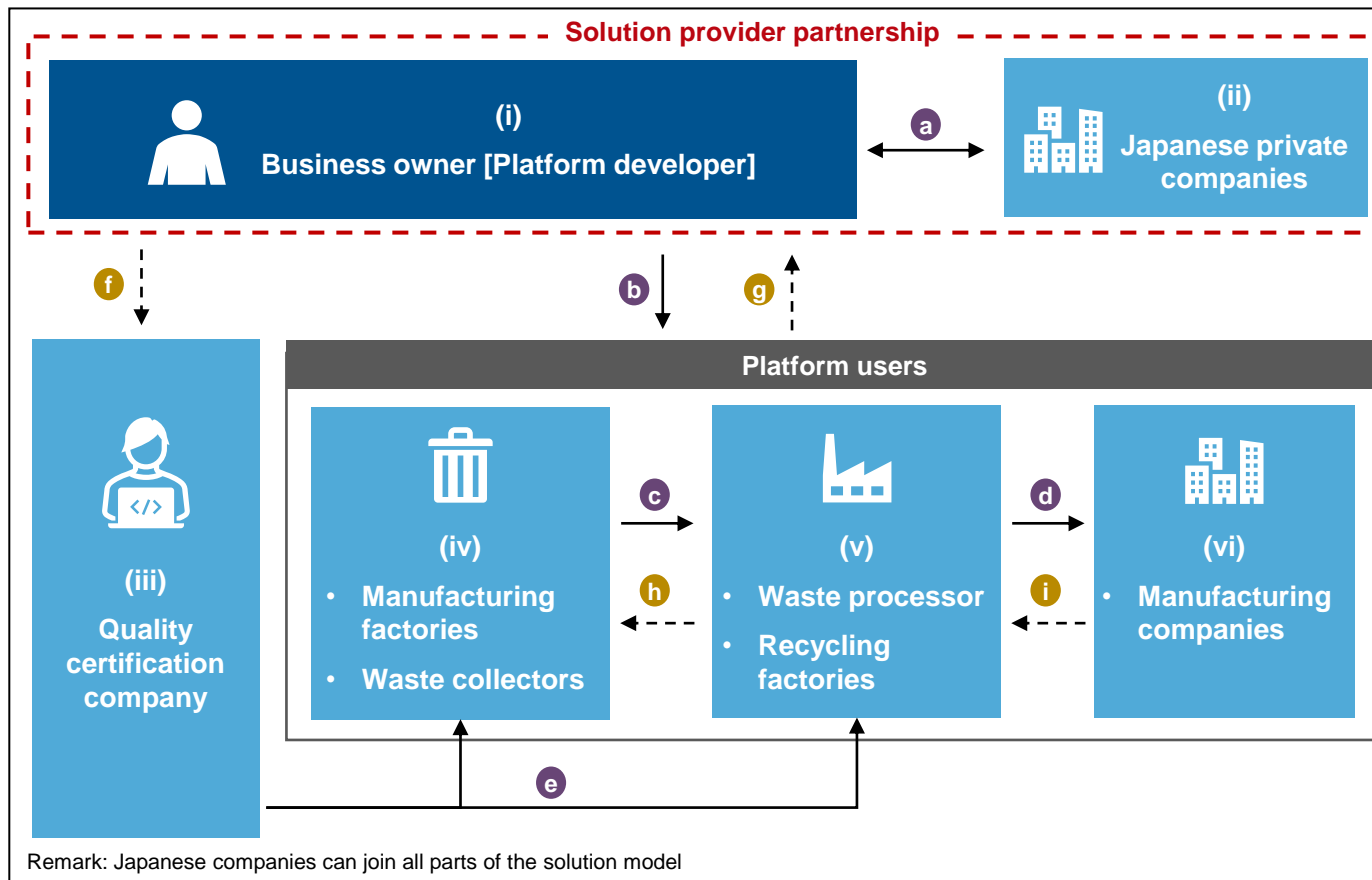
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Potential solutions for NEDO

## Goal

- To match demand with supplies of waste and recycled materials
- To provide plastic waste information that will be useful for businesses

## Solution model hypothesis



## Explanation



### Roles

- (i) **Manage operations and continuously update know-how** provided for the online platform
  - Demand and supplies information
  - Domestic and international standards for recycled materials and products
  - Guideline for circulation transformation
- (ii) **Transfer technology and know-how**
- (iii) **Certify quality**
  - Of waste from waste generator and waste collector
  - Of recycled materials from waste processor
- (iv) **Sell waste to waste processor**
- (v) **Buy waste or sell recycled materials**
- (vi) **Buy recycled materials**



### Activities

- (a) Partner know-how / information transfer
- (b) Provide access to online platform
- (c) Deliver waste
- (d) Deliver recycled materials
- (e) Certify quality of products sold on the platform



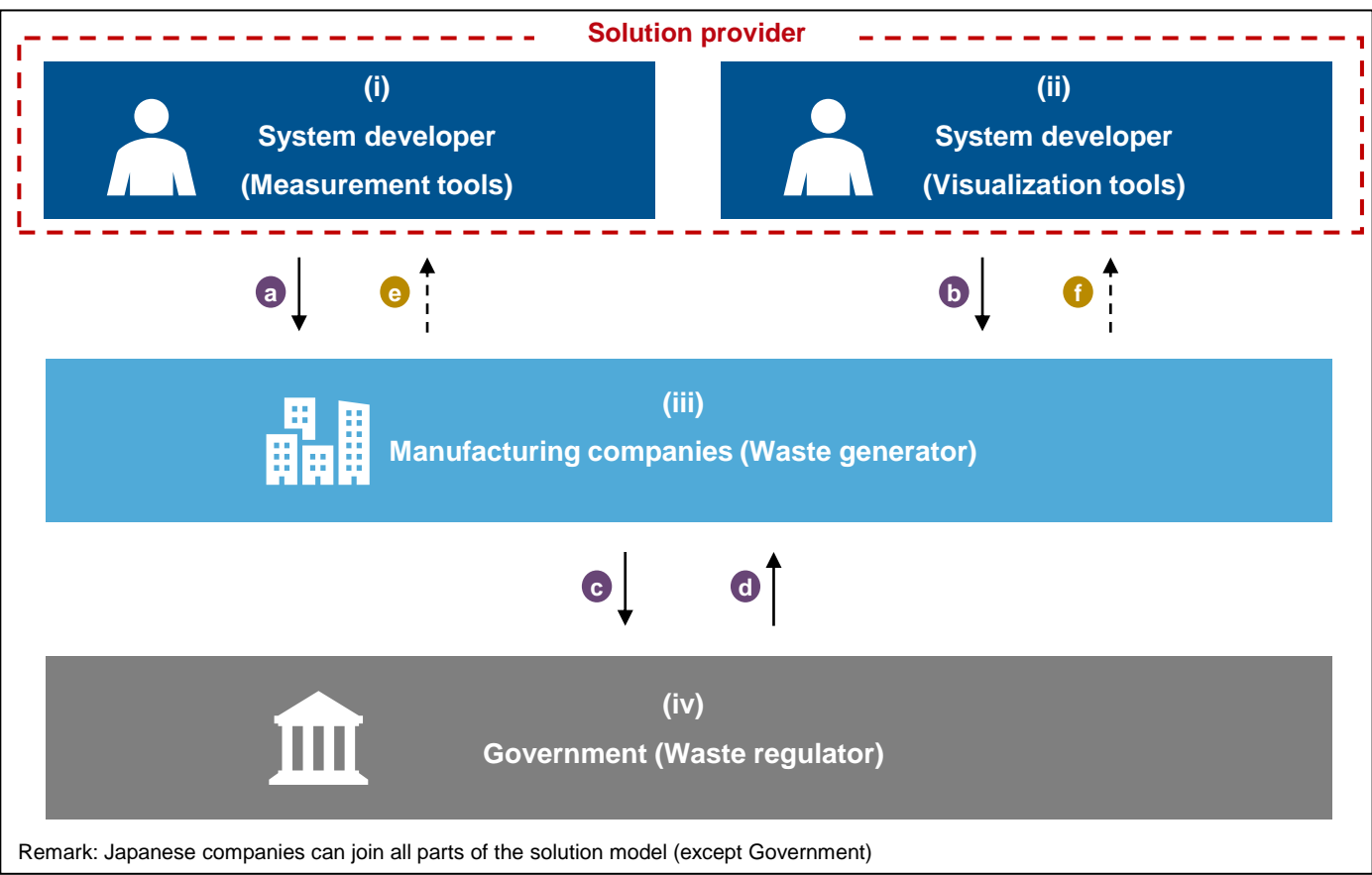
### Cash flow

- (f) Service fee/wage
- (g) Subscription/commission fee
- (h) Cash flow from waste sales
- (i) Cash flow from recycled material sales

## Goal

- To help waste generator **collect and analyze data** more accurately
- To help waste generator **monitor waste generator** more effectively

## Solution model hypothesis



## Explanation



### Roles

- (i) Provide measurement tools or machines to help with data collection (e.g. Traceability system, real-time data integration)
- (ii) Provide visualization tools to help with data analysis (e.g. plastic waste visualization dashboard)
- (iii) Utilize the tools for better data collection, analysis, and report to waste regulator
- (iv) Regulate waste generator [Optional in this solution model]



### Activities

- (a) Provide access to measurement tools
- (b) Provide access to visualization tools
- (c) Deliver industrial waste report created by the tools to waste regulator
- (d) Monitor waste generator



### Cash flow

- (e) Measurement tools subscription fee
- (f) Visualization tools subscription fee

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