

Recycling & Waste Management Business



Agenda

- Business Overview and Industry Situation
- Business Outlook and Policy
- Market Overview and Key Financial Performance
- Green Energy and Recycle Businesses in Thailand

**Business Research
January 2024**

Recycling & Waste Management Business Overview and Industry Situation

Recycling and Waste Management Business – Overview

The recycling business tends to expand. This is in line with the increasing amount of waste and the trend to reuse more waste. The Pollution Control Department predicts that the waste reuse rate will reach 51% by 2024. In addition, the government sector is driving national development with the new economic model (BCG economy), and entrepreneurs are becoming increasingly concerned about the environment and the trend towards solving the world's waste problems are factors supporting the expansion of the recycling business.

Recycling businesses are businesses that process or improve the quality of waste or used materials so that the waste is returned to the same or close to the original quality or obtain new raw materials or new products.

Recycling businesses can be divided into 4 types:



1) Non-hazardous waste collection business: The business of collecting general and industrial waste, including waste segregation and management. This group of businesses uses low technology and a lot of labor.



2) Wholesale of Waste and scrap business: A business that collects and purchases waste, sorts it by type of metal, and compresses the waste before selling it to recycling plants. It does not require much investment and technology compared to recycling.

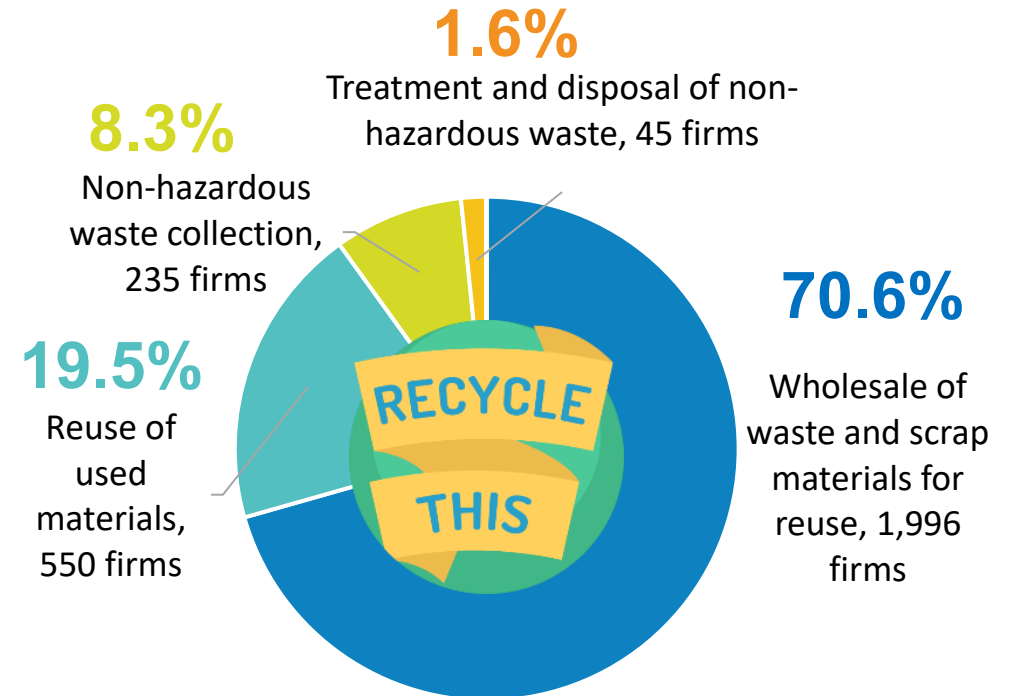


3) Treatment and disposal of non-hazardous waste business: A business that treats and disposes of non-hazardous waste by sanitary landfill, incineration, biological reduction and other treatments



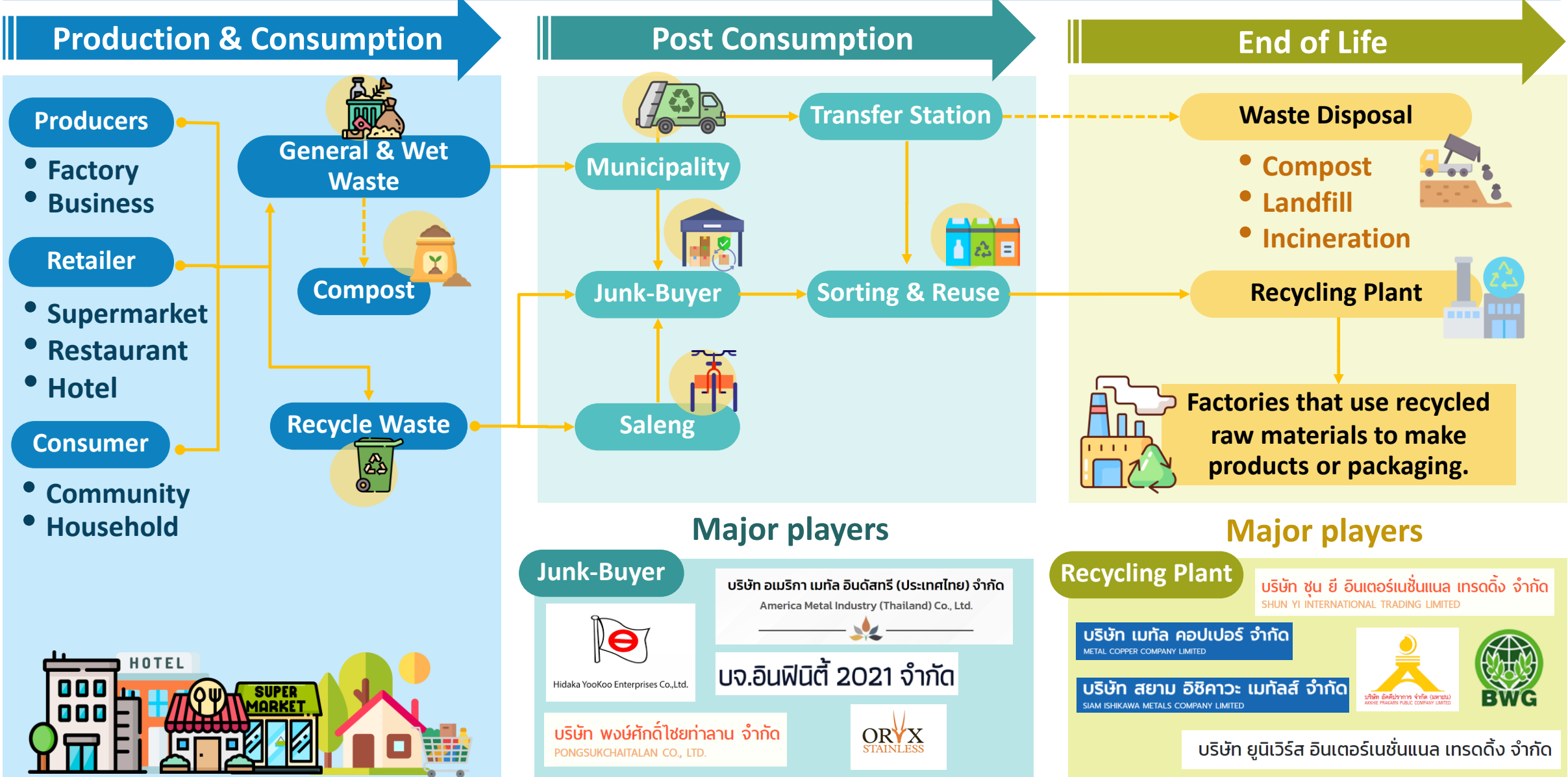
4) Recycling of used materials through the processing business: A business that takes waste and puts it through a process to turn it into a raw material. This group of businesses requires high investment and advanced technology.

Number of Legal Entities Classified by Business Mode



In 2021, there were a total of 3,040 legal entities active in recycling. And when classified by business model, it was found that the most of recycling business models were wholesale of waste and scrap materials for reuse, or 65.7% of the total number of entrepreneur.

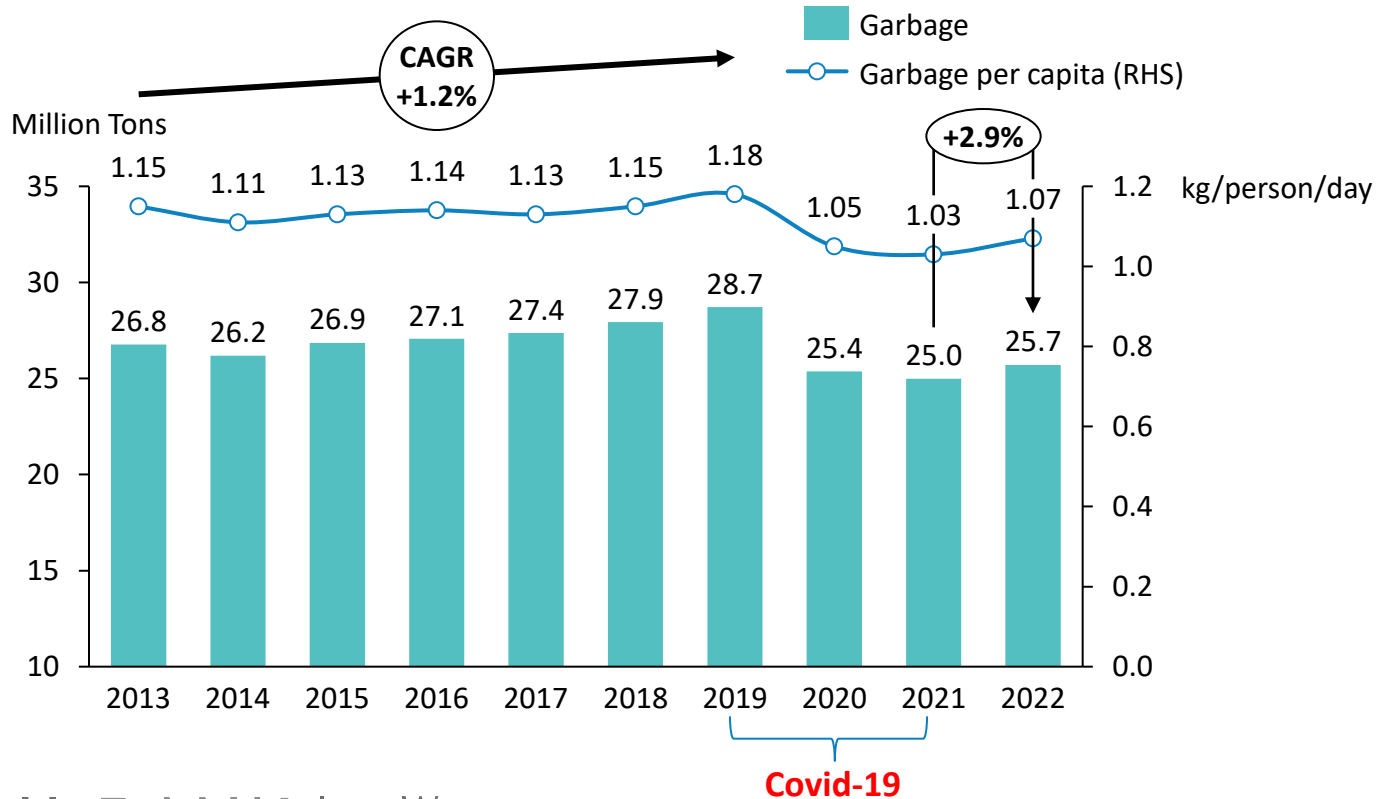
The Journey of Waste Management in Thailand



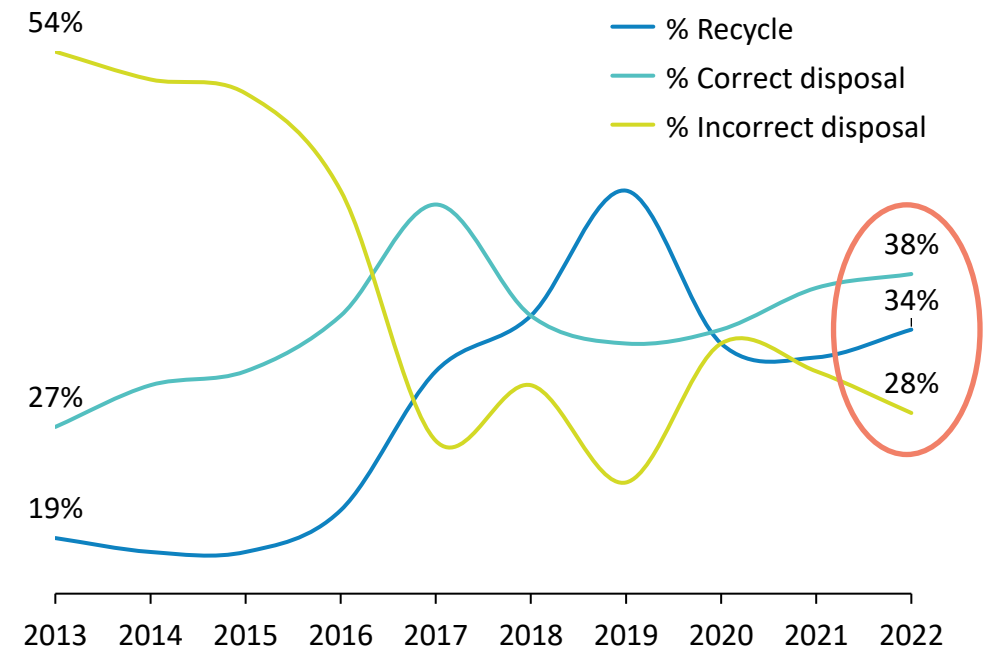
Recycling and Waste Management Business – Industry Situation

- Thailand's garbage volume tends to increase continuously from 2013 to 2019, but has decreased during the COVID-19 outbreak, from a decrease in the number of foreign tourists, while the lockdown measures have affected economic activities. **However, the amount of garbage increased again in 2022 after the COVID-19 situation was resolved** following the recovery of domestic economic activity and the gradual return of foreign tourists.
- Over the past 10 years (2013-2022), Thailand has continued to manage waste more properly, partly due to the trend of society becoming more environmentally conscious. **As a result, the demand for recycling and waste management business services has also increased.**

Thailand's garbage volume



Thailand's waste management classified by disposal process



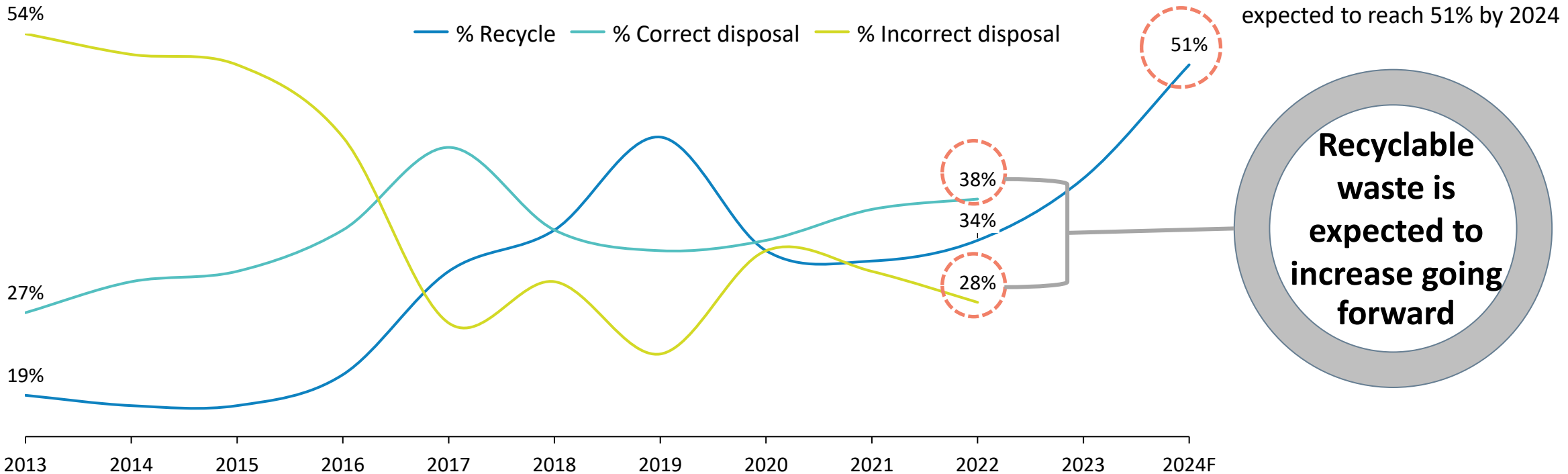
Note: 1) Correct disposal such as Landfill, Incineration, Composting
2) Incorrect disposal such as Open Dump, Open Burn

Recycling & Waste Management Outlook and Policy

Recycling and Waste Management Business - Industry Outlook

- The recycling and waste management industry typically grows along with the rise in waste quantities and the growing trend towards waste reuse. **The Pollution Control Department projects that the recycling rate will reach 51% by 2024. Additionally, it was discovered that both correctly and incorrectly disposed waste contain reusable components.** However, Thailand's deficient waste management system and the public's lack of knowledge about how to separate waste have hindered the recycling process, resulting in suboptimal amounts of waste being recycled.
- Furthermore, **businesses benefit from government policies aimed at promoting national development through the circular economy model (BCG Economy)**, leading entrepreneurs to prioritize environmental concerns in their operations. **With the government now permitting the use of recycled plastic in the food industry and committing to achieving zero plastic waste by 2027**, these developments will bolster the sustained growth of the recycling sector.

The waste recycling rate continues to increase



The waste recycling rate is expected to reach 51% by 2024

Recyclable waste is expected to increase going forward

Recycling and Waste Management Business – Government Support Policy



Thailand's Roadmap on Plastic Waste Management 2018 – 2030



The aim is to achieve a 100% plastic waste reuse rate by 2030.

Set a goal to eliminate the use of single-use plastic and switch to 100% eco-friendly alternative materials by 2030.



Allowing recycled plastics to be used in the food industry

As more entrepreneurs adopt the use of recycled plastic pellets, the demand for plastic bottle waste is expected to rise. This will facilitate the circulation of resources in line with the government's set objectives.



BOI's Investment Incentives for recycling industries

Provide tax exemptions for plastic and paper recycling businesses, as well as businesses that incorporate recycled materials in their production processes.



Recycling and Waste Management Business – Supporting factors and challenges



Waste Collection

Tailwind

- **Economic growth, particularly the increase in private consumption**, is a direct result of fiscal stimulus measures and a surge in international visitor arrivals.
- **Low operating expenses** and no need for advanced tech make it easy to get into the business.

Headwind

- **The country's waste management process is inefficient**, leading to inadequate recycling of waste.
- **Labor shortage** in waste separation process.



Wholesale of Waste and Scrap

Tailwind

- **The expansion of the recycling industry** has raised the need for waste.
- **Increased demand for recycled plastics and paper** aligns with the circular economy development plan (BCG Economy) and government business incentives.

Headwind

- **Due to the large number of players in the market**, competition is likely to become more intense.
- **A shortage of raw materials**, especially plastic and recycled paper, due to the policy of reducing the use of plastic, including the relocation of production bases of some industries and the export of recycled paper to the Chinese market.



Recycling and Waste Treatment

Tailwind

- **Consumers are increasingly concerned about the environment and the efficient use of resources.**
- **Manufacturing companies** tend to send more waste for recycling.
- **The government has measures to support recycling businesses.**
- **Thailand has an opportunity to become a recycling hub in the CLMV region**, as Myanmar and Cambodia have large amounts of waste that is not recycled.

Headwind

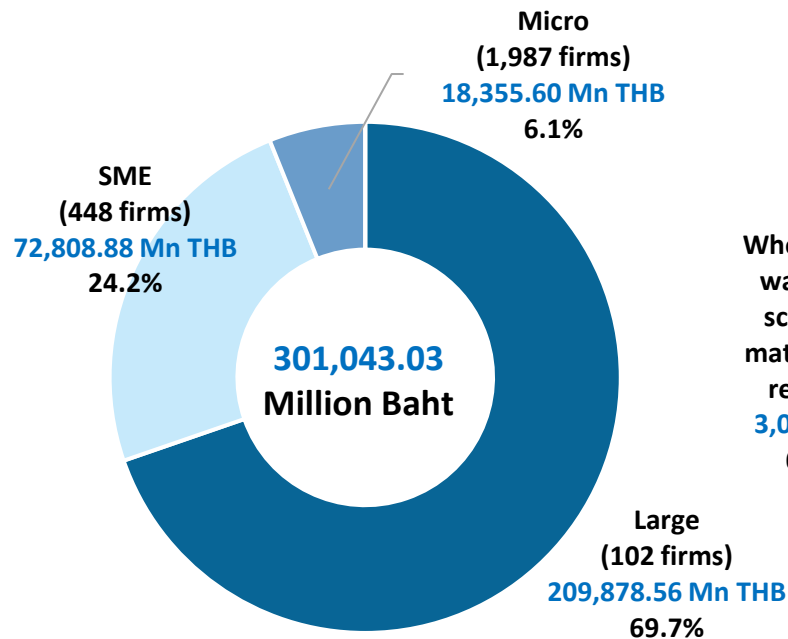
- **Some waste disposal processes have an impact on the environment.**
- **The quality of the materials** obtained from the recycling process will decrease progressively with the number of times the material is recycled.

Recycling & Waste Management Market Overview and Key Financial Performance

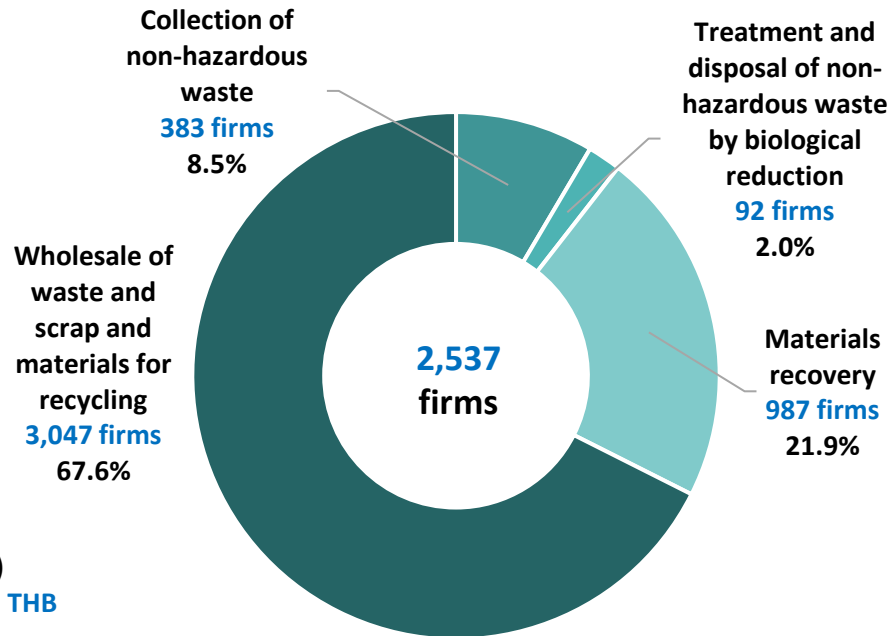
Recycling and Waste Management Business – Market Overview

In 2021, Thailand's recycling and waste management market was valued at 301,043.03 Million Baht, with the large firm size accounting for 69.7% of the market share. Furthermore, The most recycling firms operate as wholesale businesses, with accounting for 78.2% of the total market.

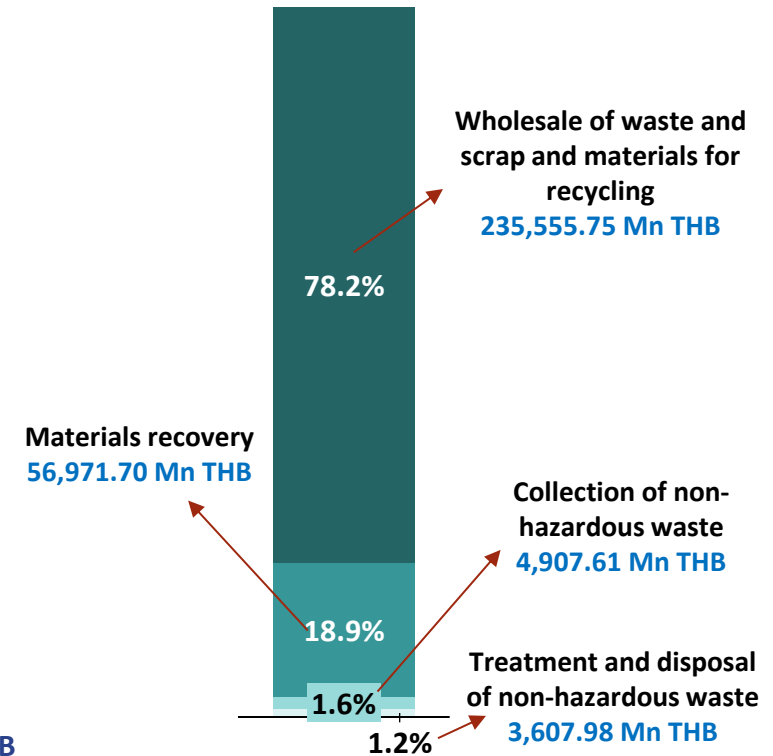
Share of Market Value by firm size



Share of Market Player by firm type



Share of Market Value by firm type



Note : No. Firm (L, SME, Micro) = 2,537 Firms No. Firm (Not Specify) = 1,972 Firms No. Total Firm = 4,509 Firms

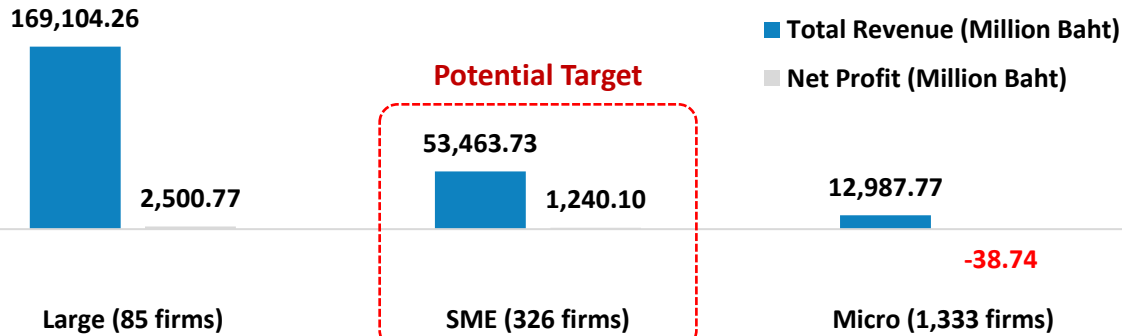
SME with revenue of 50-500 MN THB

Note: Recycling business market value is determined by aggregating the total revenue of enterprises listed under TSIC codes 38110, 38213, 38300, and 46695.

Recycling and Waste Management Business – Key Financial Performance

46695 Wholesale of waste and scrap and materials for recycling

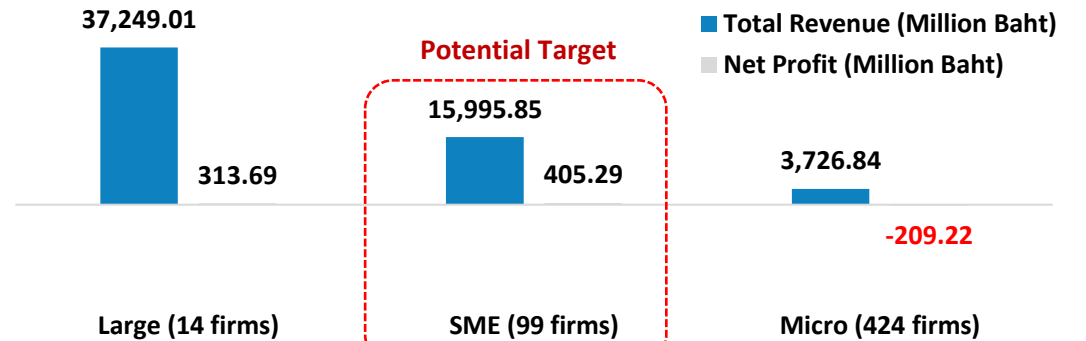
Market Value = 235,555.75 Mn THB
Total Player = 3,047 Firms*



Note: *No. Firm (Not Specify) = 1,303 Firms

38300 Materials recovery

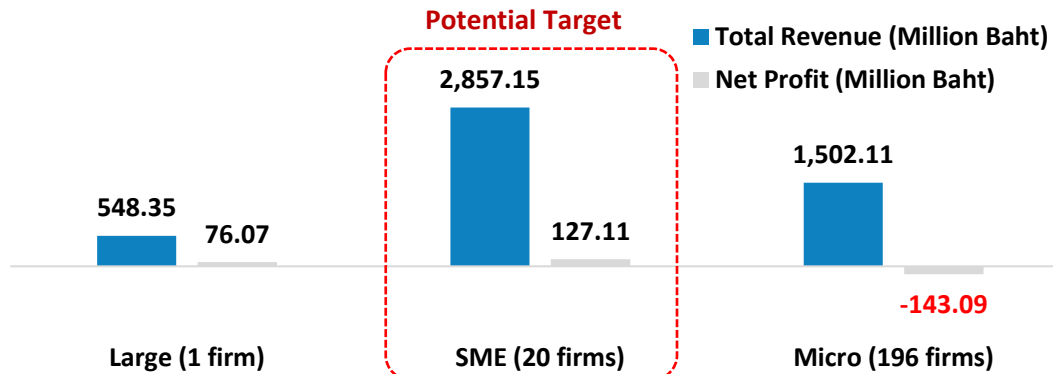
Market Value = 56,971.70 Mn THB
Total Player = 987 Firms*



Note: *No. Firm (Not Specify) = 450 Firms

38110 Collection of non-hazardous waste

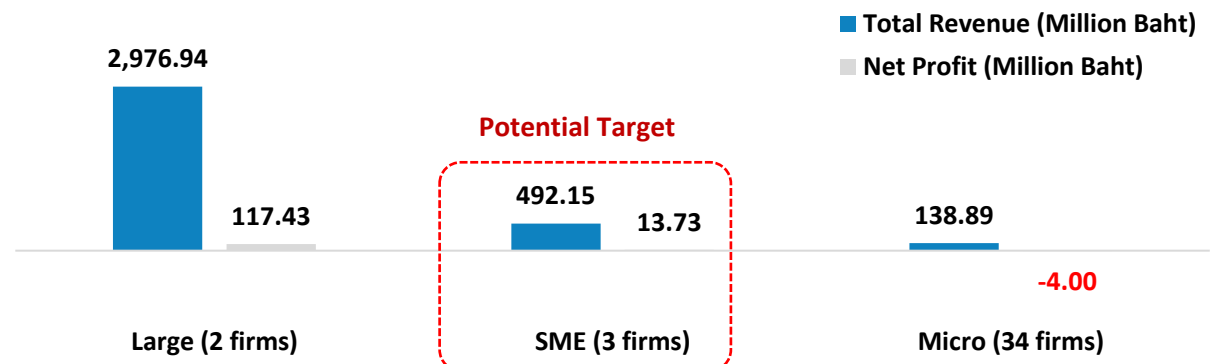
Market Value = 4,907.61 Mn THB
Total Player = 383 Firms*



Note: *No. Firm (Not Specify) = 166 Firms

38213 Treatment and disposal of non-hazardous waste by biological reduction

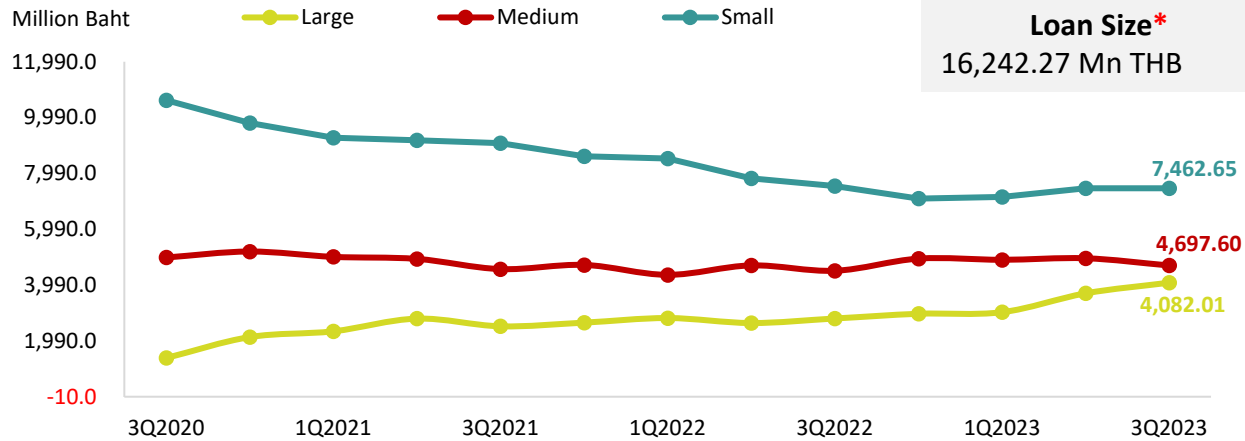
Market Value = 3,607.98 Mn THB
Total Player = 92 Firms*



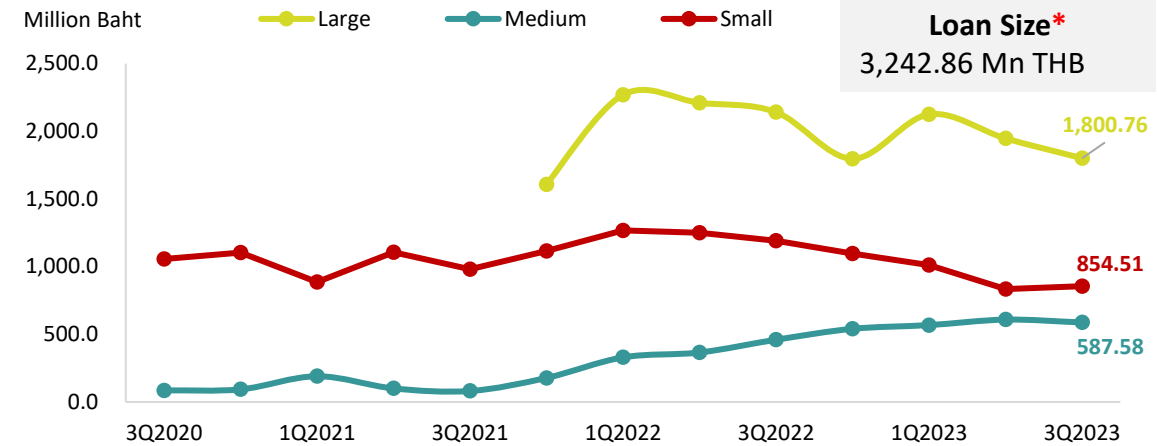
Note: *No. Firm (Not Specify) = 53 Firms

Recycling and Waste Management Business – Loan Outstanding

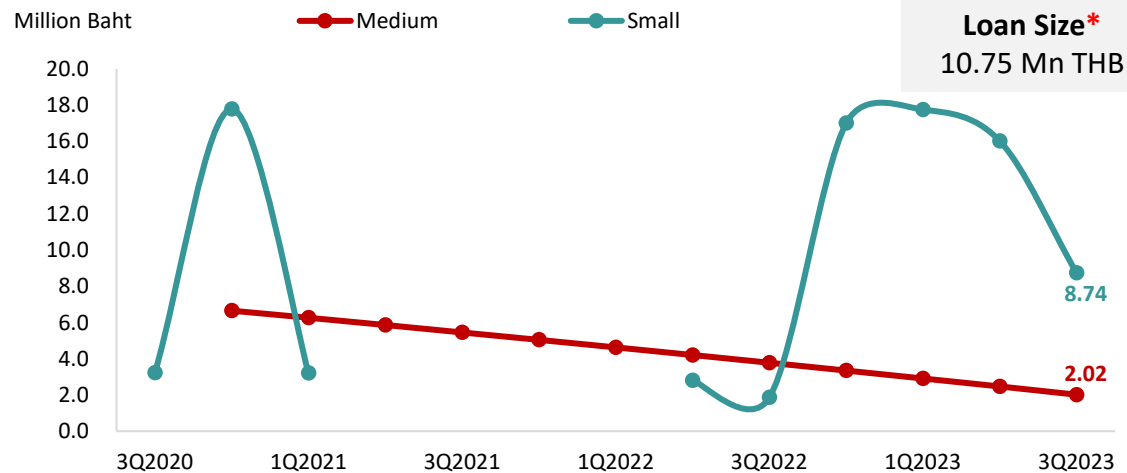
46695 Wholesale of waste and scrap and materials for recycling



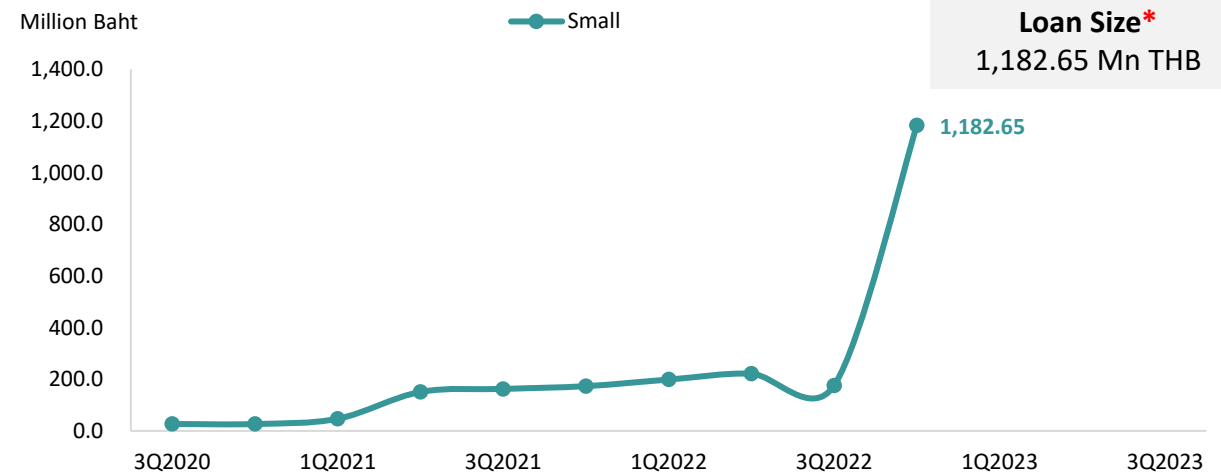
38300 Materials recovery



38110 Collection of non-hazardous waste



38213 Treatment and disposal of non-hazardous waste by biological reduction



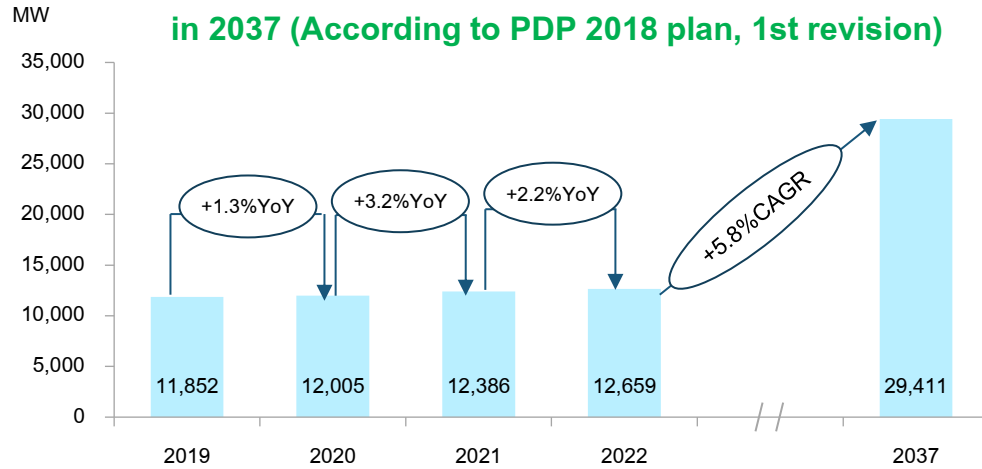
* Data as of 3Q2023

Overview of Green Energy and Recycle Businesses in Thailand

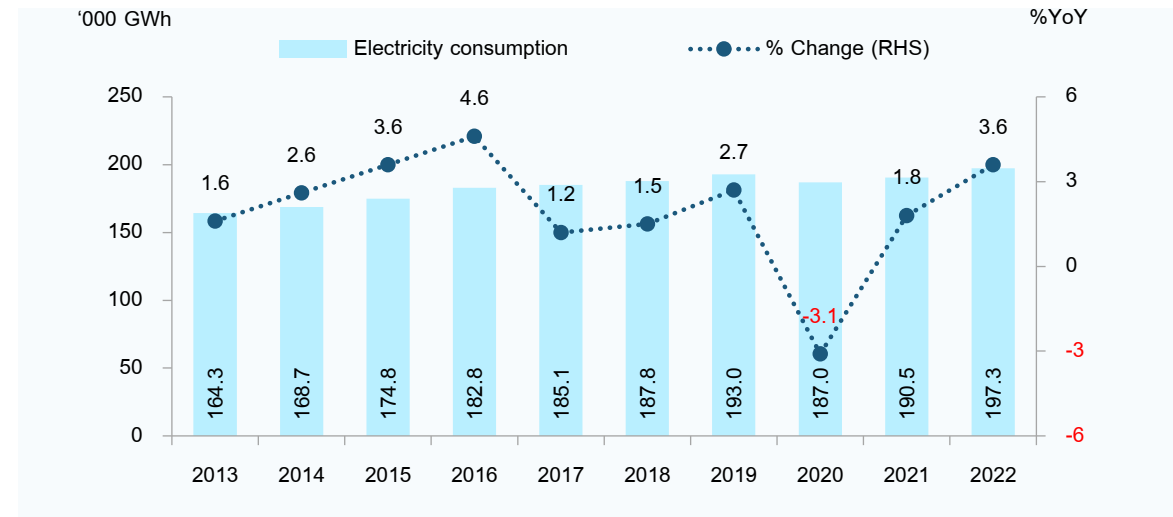
Green energy or clean energy is energy from resources that are not fossil fuels, or it can be called 'renewable energy' because it comes from renewable energy sources such as wind, solar, water, biomass, etc. The use of green energy is a result of the problems of environmental degradation and global warming. It is a solution for sustainable development, reducing the use of fossil fuels and reducing carbon gas emissions.



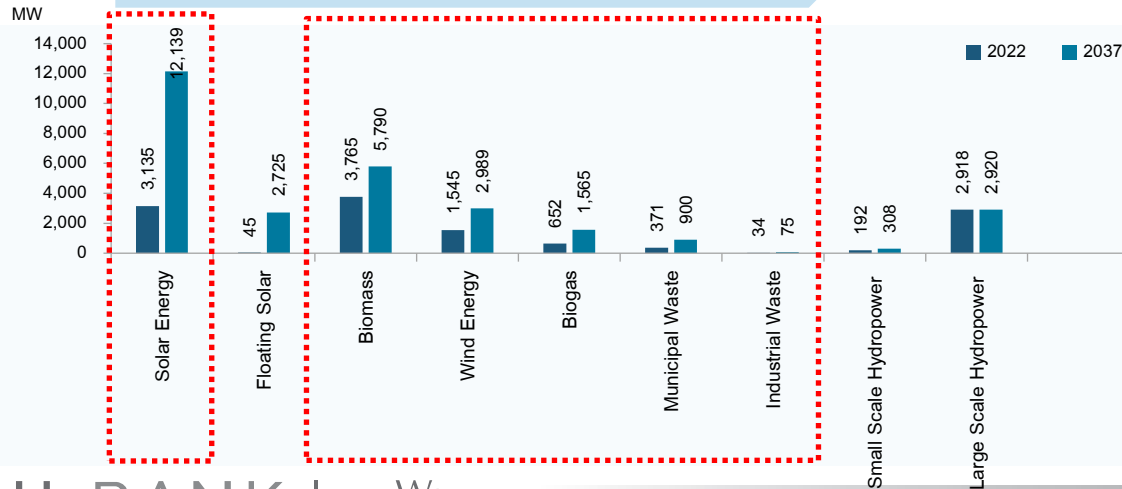
Amount of electricity produced from renewable energy and targets



Overview of Thailand's electricity consumption



Divided by type of renewable energy



Clean energy is a business with good potential for expansion. This is because the cost of producing clean energy has declined significantly. Meanwhile, electricity consumption continues to rise. In addition, the use of clean energy in Thailand is supported by the government in both the short and long term.

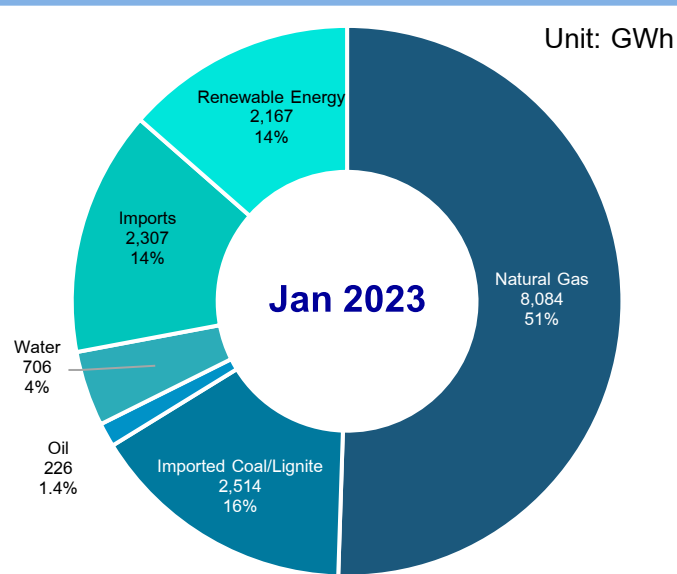
When the price of clean energy is lower, consumers tend to use more clean energy products and services. For example, Thai people are increasingly installing solar panels in their homes and factories to save on electricity bills.

Solar Energy, Floating Solar, Biomass, Wind Energy, Biogas, Municipal Waste, Industrial Waste = is a renewable energy group that is expected to mostly be SME.

The solar rooftop business is expected to continue to grow. The average electricity rate is expected to continue to rise due to the increase in energy costs and the cost of electricity generation, while production and installation costs tend to fall. This will encourage entrepreneurs to turn to the business of installing solar panels for households and SMEs.



Proportion of Electricity Generated From Different Fuel Types

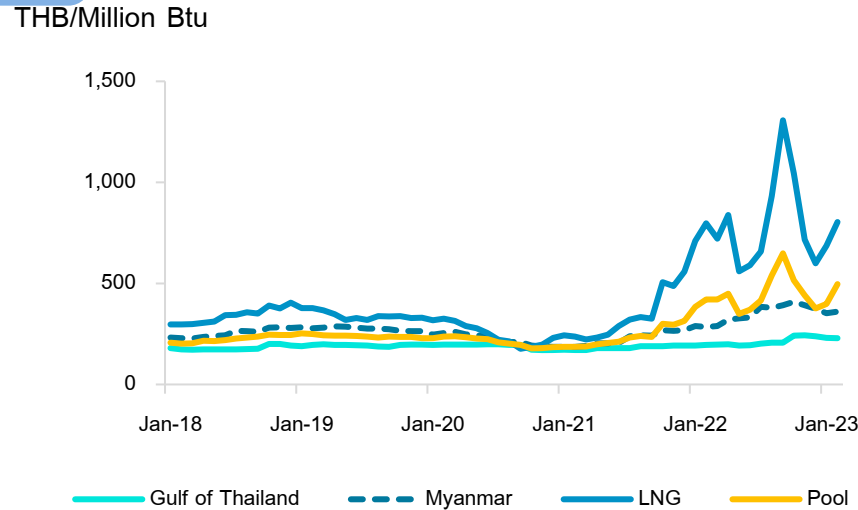


Total 16,003 GWh

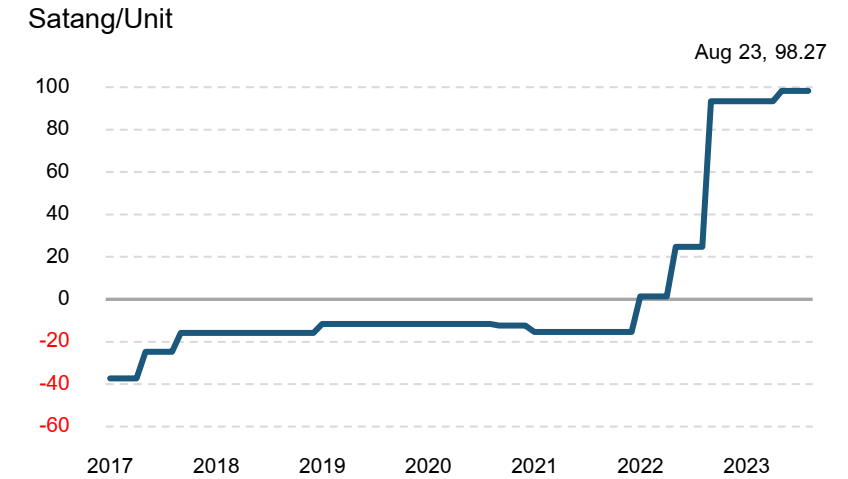
Note : (1) Electricity generation excludes electricity generated by Independent Power Supply (IPS). (2) Electricity generation from oil includes electricity generation from palm oil by the Bang Pakong power plant.



Natural Gas Price

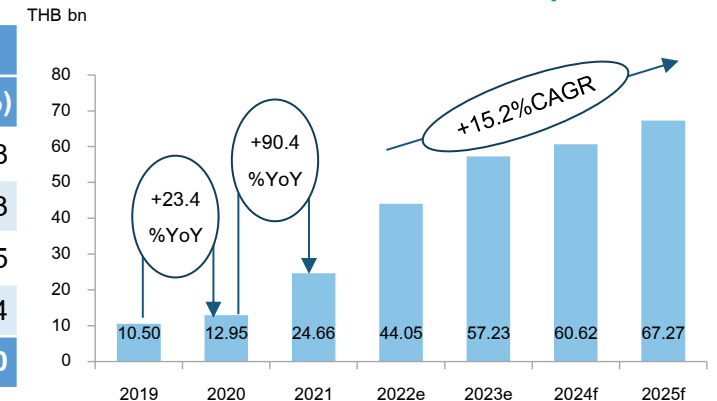


Retail Ft value

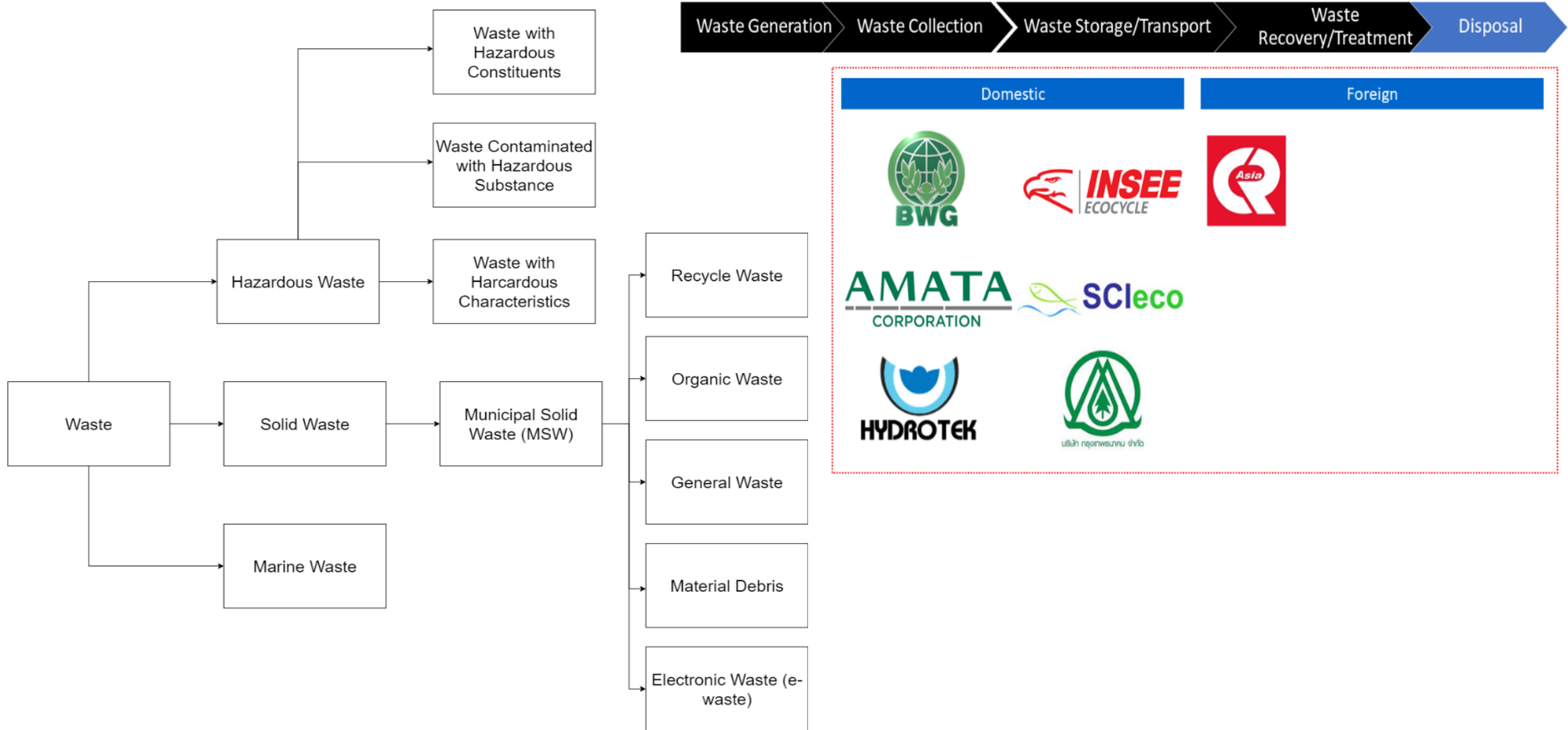


Sectors	Electricity Usage			2022	
	2020	2021	2022	%YoY	Share (%)
Household	52,860	54,290	53,738	-1.0	28
Business	43,950	41,529	46,094	11.0	23
Industry	82,158	86,427	88,563	2.5	45
Others*	8,078	8,223	8,829	7.4	4
Total	187,046	190,469	197,224	3.5	100

The Market Value of Solar Rooftop in Thailand

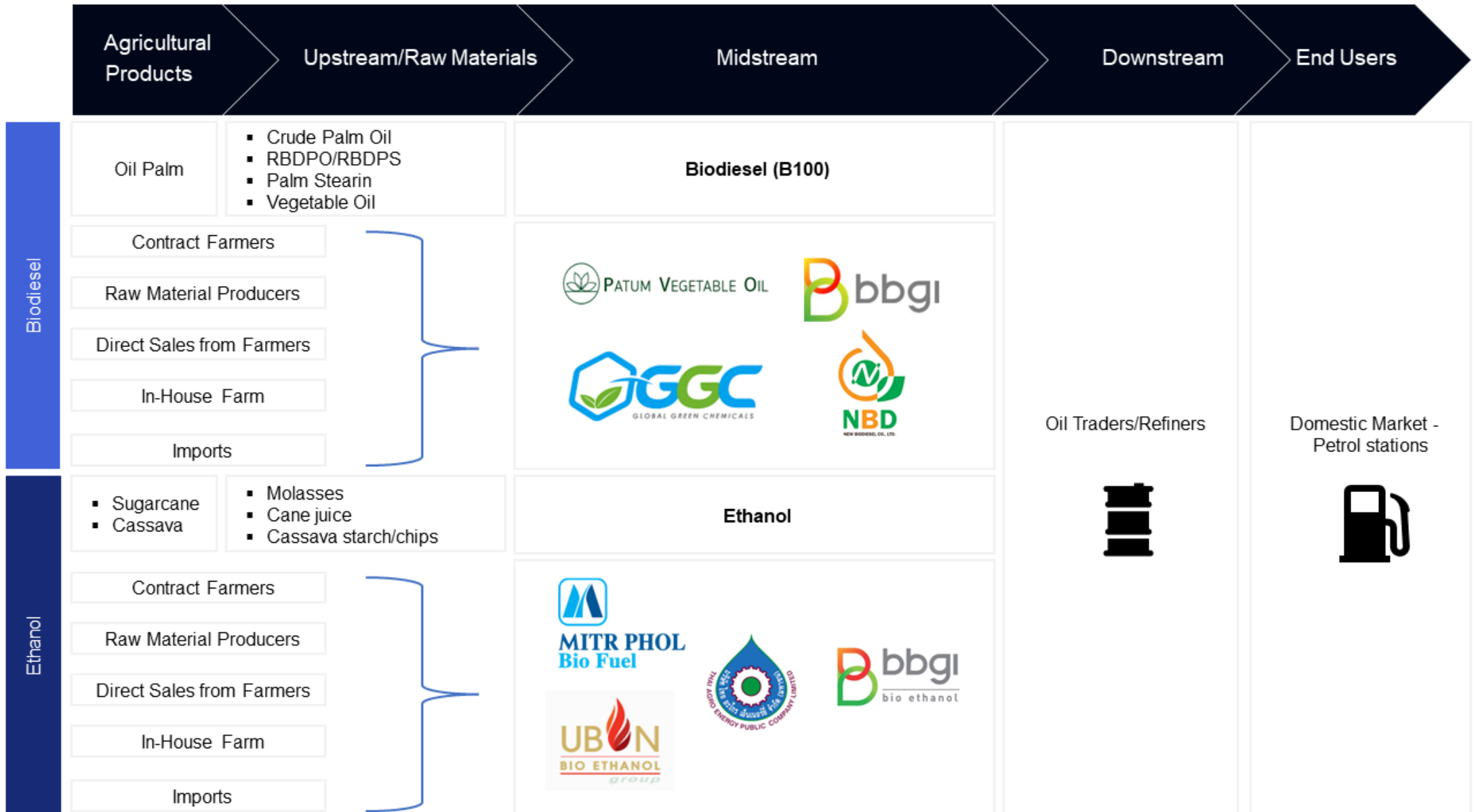


Thailand's Waste Treatment Industry Value Chain: Overview

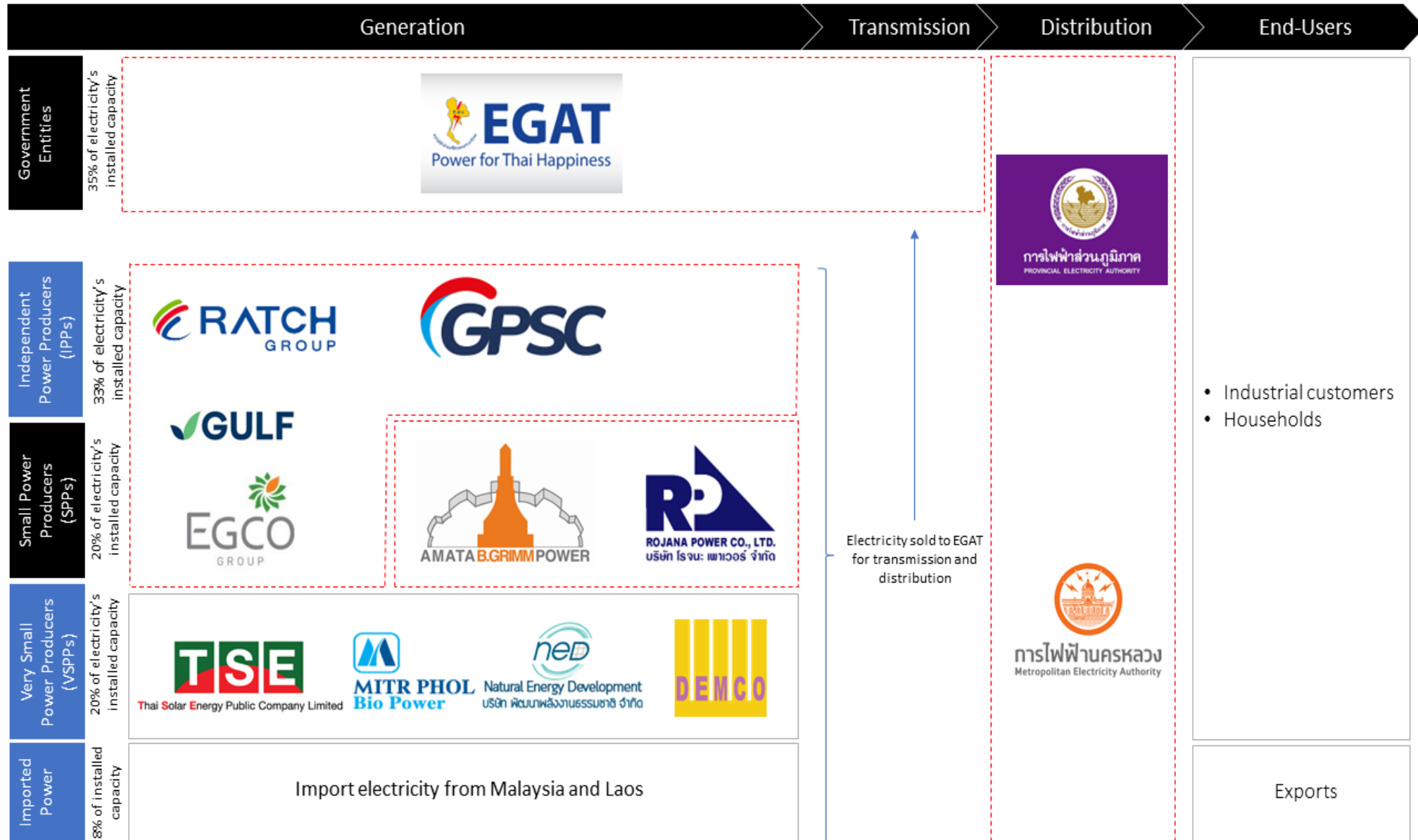


Source: LH Bank Business Research analysis based on data from Speeda

Thailand's Biofuel Industry Value Chain: Overview



Thailand's Thermal Power Industry Value Chain: Overview



End of Presentation

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