

# Biotechnology

## Agenda

- Business Overview
- Business Outlook
- SMEs Business Opportunities



Business Research  
January 2024



**Biotechnology business** experiences continuous growth due to factors such as advances in medical technology, including the development of new innovations and treatments for currently incurable diseases. Additionally, with the rise in the elderly population, which is known to spend more on healthcare, biotech-related companies are thriving. However, the biotech business is complex and demands significant investment, carrying inherent risks. There is a chance of producing ineffective medication to treat diseases.

**Biotechnology** applies various techniques or processes to manipulate living organisms, parts of living organisms, or products derived from living organisms for the benefit of humans in various fields, such as



**1 Agriculture:** Assist in the development and enhancement of plant varieties through tissue and cell culture as well as gene editing. This includes the creation of crops that are resistant to pests and the development of fruits that ripen at a slower pace.



**2 Food:** Enhances the value of food products by increasing the quantity of beef or pork and decreasing the cholesterol content of egg yolks, etc.

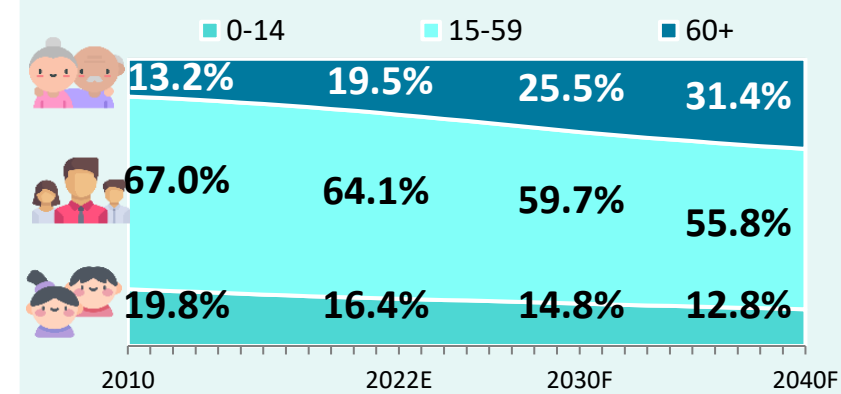


**3 Environment:** Decrease the usage of environmentally harmful chemicals, such as utilizing organic waste as fertilizer and employing microorganisms to manage wastewater and trash.



**4 Medical:** The creation of vaccines to prevent disease, the production of antibodies for diagnosing and treating diseases, and the utilization of DNA technology to identify genetic abnormalities or diseases.

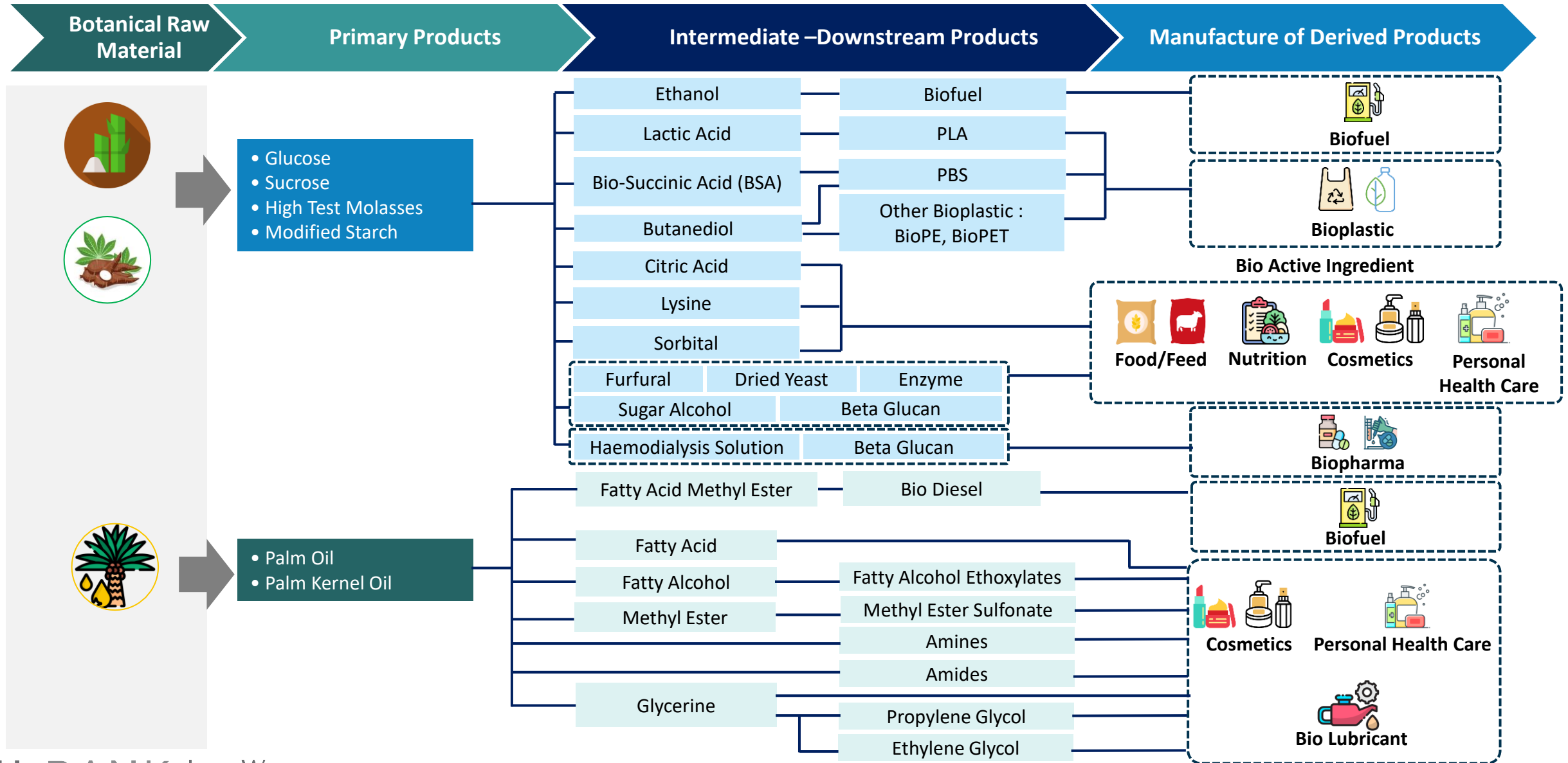
Thailand is becoming an aging society soon, with over 20% of the population being aged 60 or older in the coming years.



Number Of Legal Entity Operators Classified By Business



# Thailand's Biotechnology Industry : Value Chain



# Thailand's Biotechnology Industry : Market Players

## Private Sector



## Government Agency



## Research & Calibration Agency



## Academic



### SMEs in Biotechnology industry

- Herbal Processed Products**  
(shampoo, soap, toothpaste)
- Natural Cosmetic Products**
- Bioplastic Products**
- Biochemical Products**
- Biomaterial Processed Products**



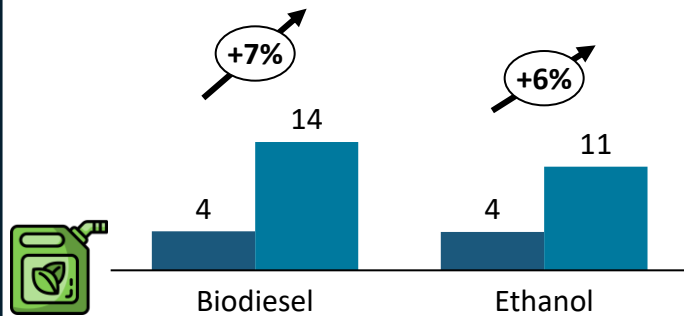
# Thailand's Biotechnology Industry : Outlook

## Biofuel

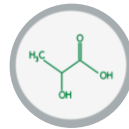
Unit: MN Litres/day

■ 2018 ■ 2036

Targets under Alternative Energy Development Plan



## Biochemical (5 future industries)



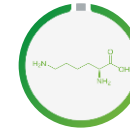
**Lactic acid**  
140,000 t/yr



**Citric acid**  
15,000 t/yr



**Sorbitol**  
43,000 t/yr



**Lysine**  
47,000 t/yr



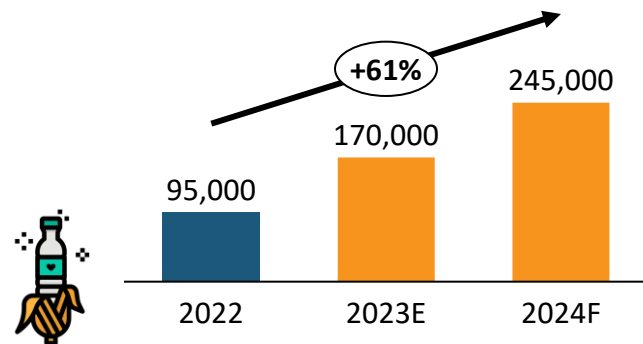
**Oleochemicals**  
120,000 t/yr

- The development of Biotechnology is key focus of Bioeconomy as one of major sectors under Thailand's Bio-Circular-Green (BCG) economy model, which is covering on Bioenergy (biofuel), Biochemical and Biomaterial (biochemical, biopharmaceuticals) and. The goal is to achieve energy security and convert to high-value commodity products.
- Thailand's biotech-industries has the advantage of having many raw materials in the country. The government aims to promote Thailand as global hub for these new s-curve industries. Especially for the bioplastic, Thailand is ranked 2<sup>nd</sup> global largest production capacity after the USA, with over 90% of products produced for export.

## Bioplastics

Unit: T/Yr

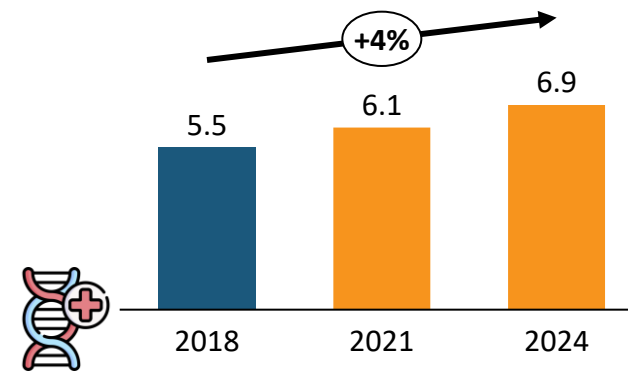
Thailand's bioplastic production capacity (2022, Thailand is #2 largest producer, #1 is USA)



## Biopharmaceuticals

Unit: BN USD

Thailand's pharmaceutical market



- For the biopharmaceuticals, Thailand is also one of the destination for health & wellness, but the high value products (special medicines / vaccines) still needed to imports around 1/3 of total market (77.83 BN THB in 2020). Therefore, Thailand needs to increase the local production of biopharmaceuticals to improve the country's health security.

# Thailand's Biotechnology Industry : Supporting factors and challenges

## Tailwind



- **Thailand has a biodiversity advantage in terms of raw materials.** It is a source of biomass resources from the agricultural sector and there is a large amount of biomass resources left over from the agricultural production process.



- **Thailand's agricultural sector produces enough food for consumption and exports agricultural products as a top priority in the world** due to its geopolitical location and natural resources. It is suitable for agricultural production and investment and can be further developed for commercial purposes.



- **Thailand has a good infrastructure with good scientists and laboratories.** There are agricultural research organizations in both the public and private sectors. This includes the growth of sustainable industries that are expanding. Local knowledge is being developed into community products.



- **The biotechnology is one of the targeted industries (New S-curve)** in the government's plan to promote the bioeconomy.

- **The trend towards environmental protection and green consumption opens more channels for market expansion,** such as organic products.

## Headwind



- **Thailand still has few entrepreneurs due to the limited number of people with specific expertise** and the relatively high cost of production technology, and still has to rely on imports from abroad, as well as laws and regulations on intellectual property, which are not conducive to investment.



- **Prices of agricultural products fluctuate due to uncertain economic conditions** both in the country and in the global economy, including the problems caused by climate change.



- **Lack of commercial research and development.** Meanwhile, government support remains ineffective and inconsistent.



- **Some consumer groups still do not give importance to changing their behavior** to use natural and environmentally friendly products, including some products that are still expensive.

# Thailand's Biotechnology Industry : Government's Support Policy

## 1. Measures to develop Thailand's biological industry 2018 - 2027

### Lower Northern

In 2017-2026, The total investment value is approximately **51,000 MB**

**Nakhornsawan Province: 41,000 MB**



1) **Palm Bio Complex** 10,000 Million THB



2) **Lactic Acid** 6,500 Million THB



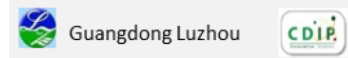
3) **PLA** 4,300 Million THB



4) **Bio-Succinic Acid (BSA) & Bio 1,4 Butanediol** 11,200 Million THB



5) **Furfural** 6,000 Million THB



6) **Lactic Acid for Food** 3,000 Million THB



**Kamphaengphet Province: 10,000 Million THB**

1) **Dried Yeast** : 1,500 Million THB

2) **Yeast Extract** : 2,000 Million THB

3) **Beta-Glucan (Food)** : 3,000 Million THB

4) **Beta-Glucan (Animal Feed)** : 2,000 Million THB

5) **Functional Sugar** : 2,000 Million THB



### Central Northeastern

In 2017-2026, The total investment value is **35,030 Million THB**

1) **Bioeconomy industrial park** : 20,000 MB



2) **Yeast Probiotics** : 55 MB



3) **Liquid Enzyme** : AST-ASAHI



4) **Beta-Glucan (by fermentation)** : 25 MB



5) **Lactic Acid (Food & Cosmetic)** : 6,000 MB



6) **Sugar Alcohol (Food & Cosmetic)** : 2,500 MB



7) **Dried Yeast** : 900 MB



8) **Phytase enzyme (Animal Feed)** : 200 MB



9) **Resistant starch** : 30 MB



### Eastern Economic Corridor

In 2018-2021, The total investment value is approximately **9,740 Million THB**

1) **Bioplastic Project, Rayong** : 3,500 Million THB  
(Lactide 100 KTA , PLA 75 KTA)



2) **Haemodialysis Solution Project, Chonburi** : 2,240 Million THB



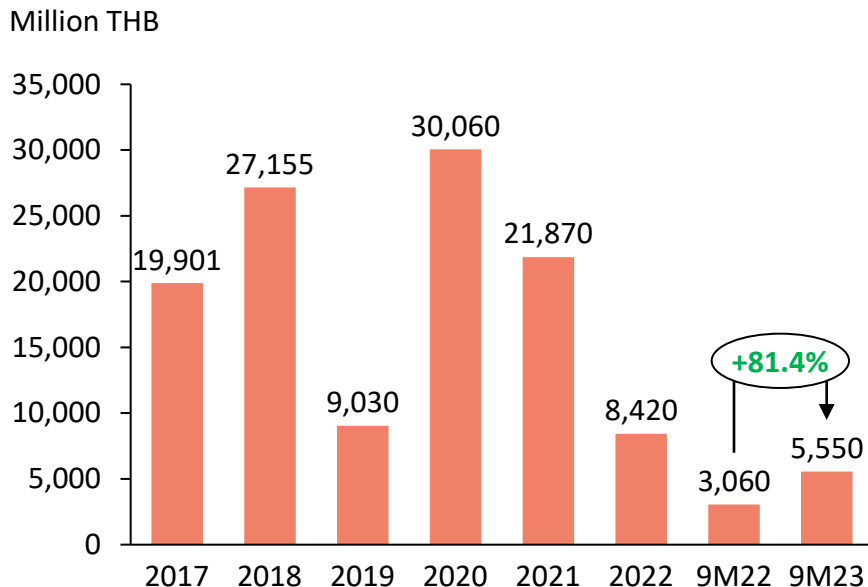
3) **Palm Bio Complex Phase 1&2, Chonburi** : 4,240 Million THB



# Thailand's Biotechnology Industry : Government's Support Policy

## 2. BOI's Investment Promotion Measure

In 2017 – 9M2023, BOI approved investment promotion applications in biotechnology industry worth a total of **121,986 Million THB**.



### List of Activities Eligible for Investment Promotion

Activities	Incentive	Exemption of CIT	Exemption of import duties on machinery	Exemption of import duties on raw materials used in R&D	Exemption of import duties on raw materials used in production for export	Non-tax incentives*
1) Manufacture of bioplastic or products from bioplastic derived from the continual process within the same project	A2	8 Years	✓	✓	✓	✓
2) Manufacture of products from bioplastic	A3	8 Years	✓	✓	✓	✓
3) Manufacture of biochemicals	A2	8 Years	✓	✓	✓	✓
4) Manufacture of Biotechnology	A1	8 Years	✓	✓	✓	✓
5) Biotechnology development	A1+	10 – 13 Years	✓	✓	✓	✓

\* Non-tax incentives : Permit to own land, Permit to bring into the Kingdom skilled workers and experts to work in investment promoted activities, Permit for foreign nationals to enter the Kingdom for the purpose of studying investment opportunities, Permit to take out or remit money abroad in foreign currency



# Thailand's Biotechnology Industry : Market Overview

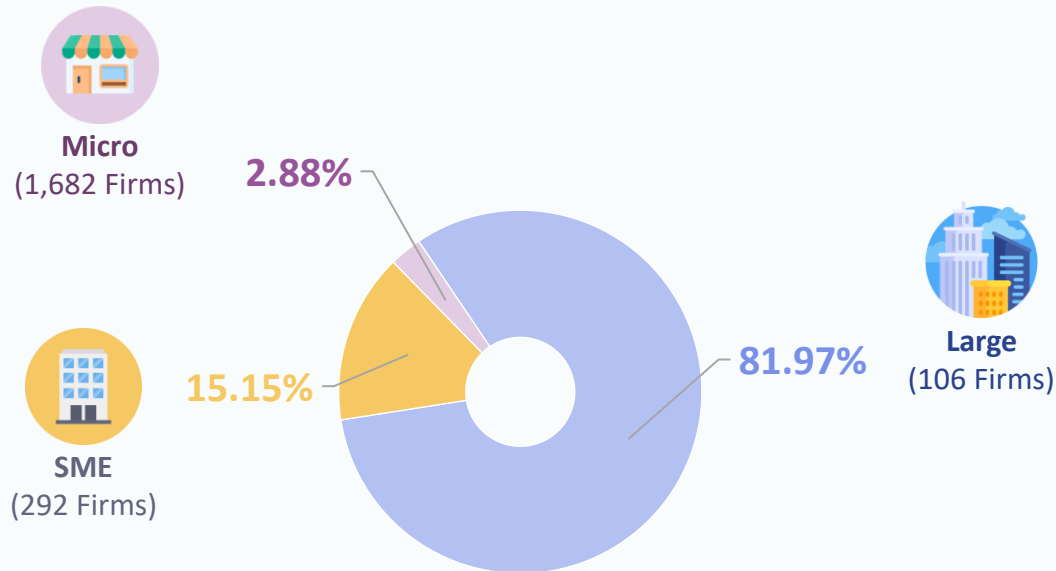
Based on selected TSIC groups (in 2022), Thailand's Biotechnology Industry was valued at 343,479.34 million baht, with large enterprises accounting for 81.97% of the market share. This is followed by SME with 15.15% and micro with 2.88%.

## Share of Biotechnology Industry Value by firm size

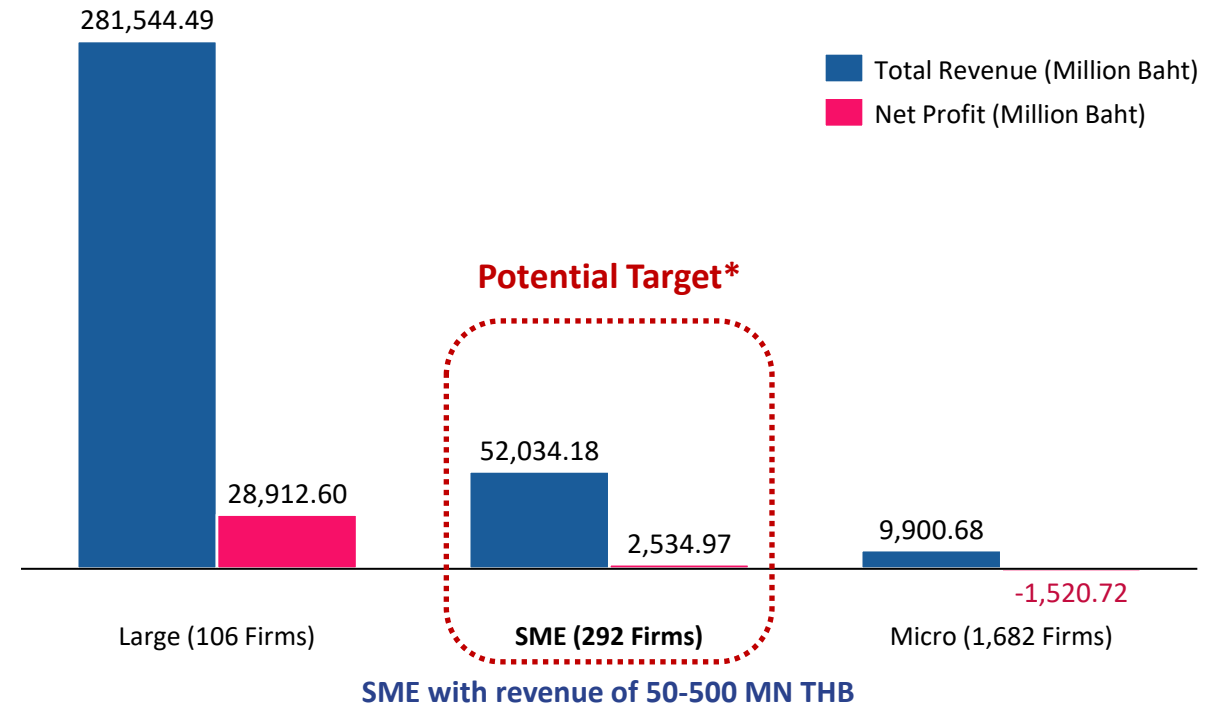
(20114, 20115, 21001, 21002, 72101, 72102, 72109)

Market Value (L, SME, Micro) = 343,479.34 Mn THB

Total Firms = 3,839 Firms



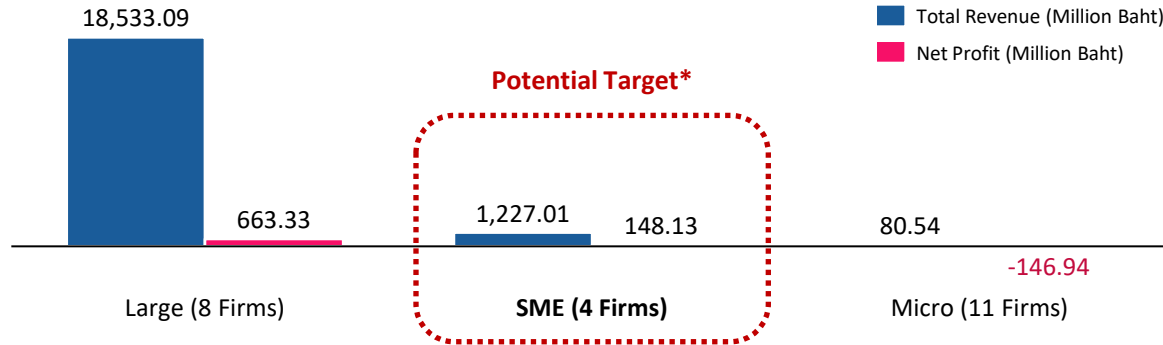
Note : No. Firm (L, SME, Micro) = 2,080 Firms    No. Firm (Not Specify) = 1,759 Firms    No. Total Firm = 3,839 Firms



# Thailand's Biotechnology Industry : Key Financial Performance

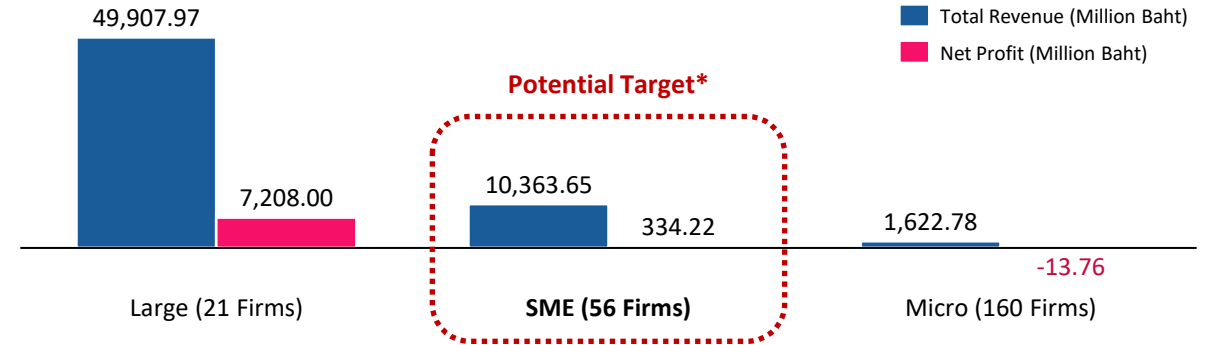
## 20114 : Manufacture of ethanol and ester

Market Value = 19,840.64 Million Baht  
Total Players = 32 Firms



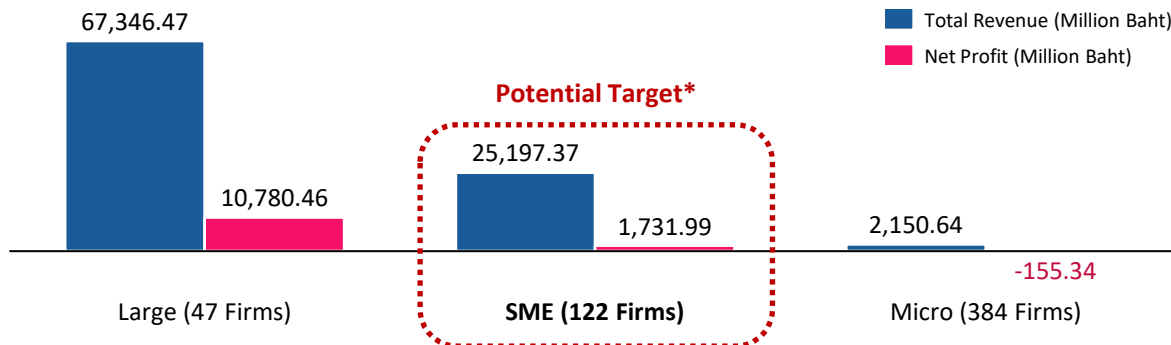
## 20115 : Manufacture of other basic organic chemicals

Market Value = 61,894.40 Million Baht  
Total Players = 354 Firms



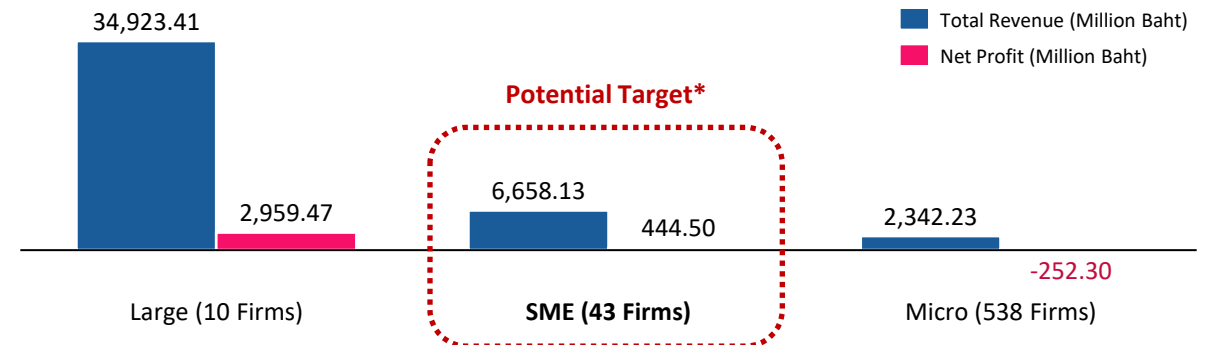
## 21001 : Manufacture of pharmaceuticals, medicinal chemical products

Market Value = 94,694.48 Million Baht  
Total Players = 839 Firms



## 21002 : Manufacture of medicinal botanical products

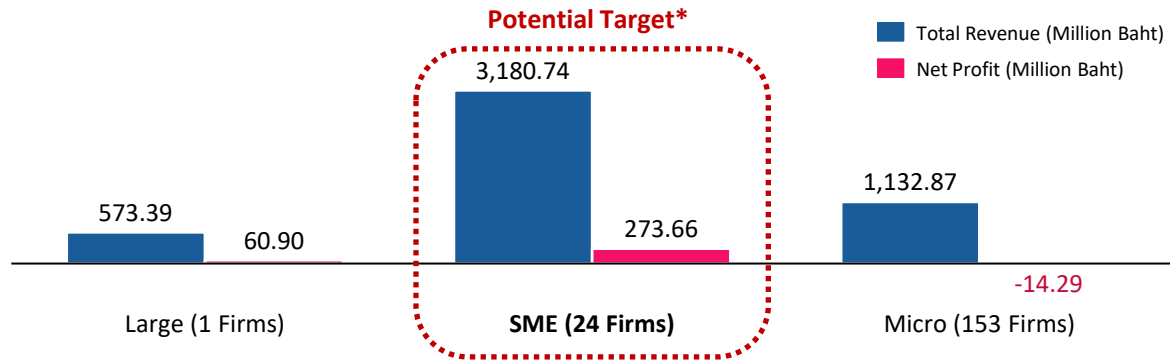
Market Value = 43,923.77 Million Baht  
Total Players = 1,433 Firms



# Thailand's Biotechnology Industry : Key Financial Performance

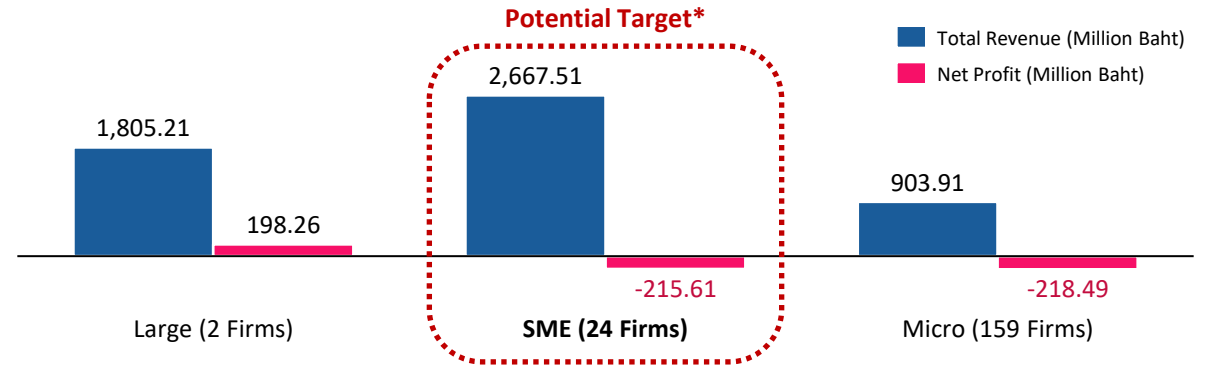
## 72101 : R&D on natural sciences

Market Value = 4,887.00 Million Baht  
Total Players = 254 Firms



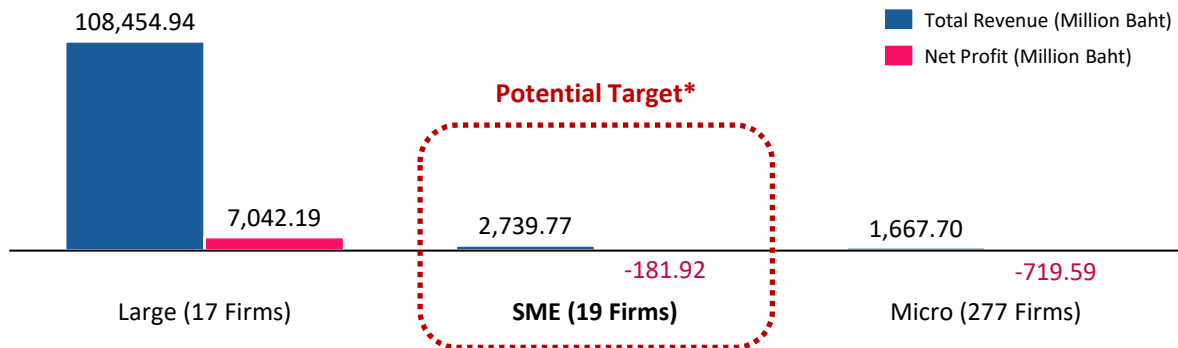
## 72102 : R&D on biotechnology

Market Value = 5,376.63 Million Baht  
Total Players = 363 Firms



## 72109 : R&D on other engineering and technology

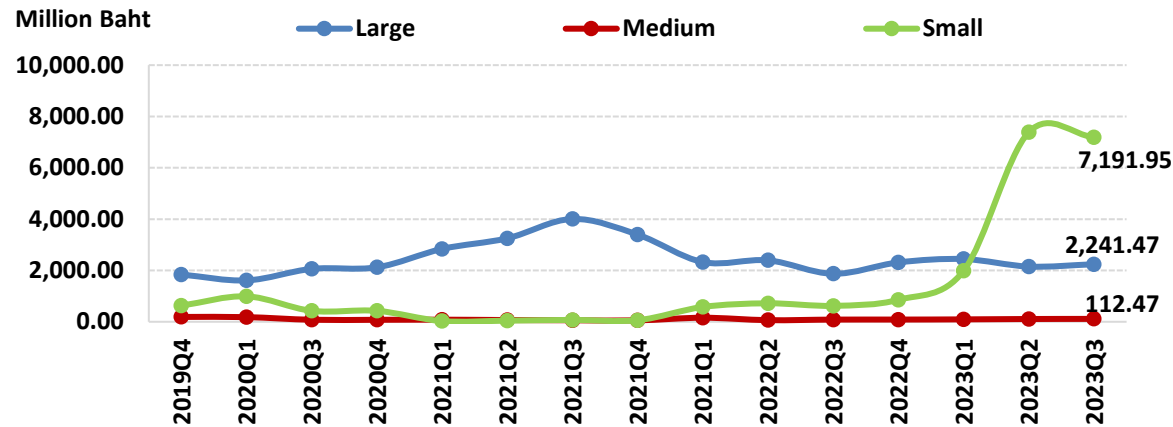
Market Value = 112,862.42 Million Baht  
Total Players = 564 Firms



# Thailand's Biotechnology Industry : Loan Outstanding

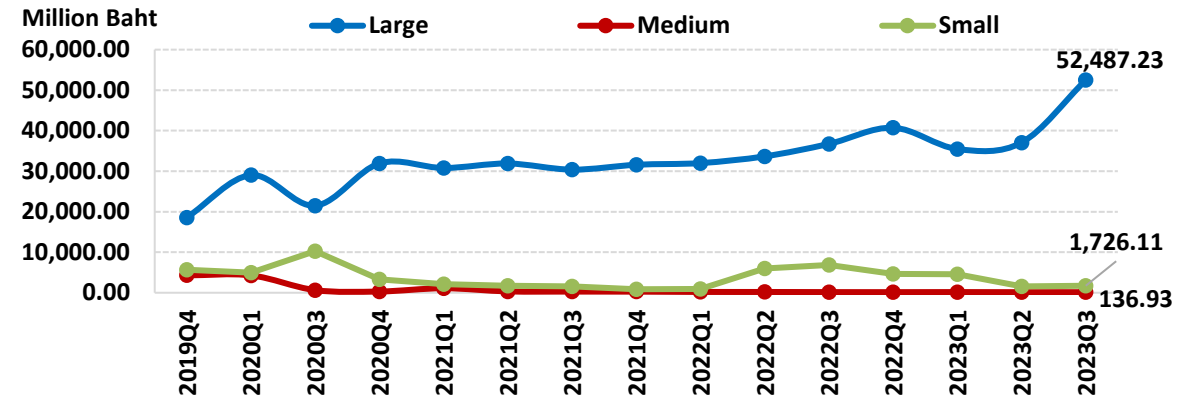
## 20114 : Manufacture of ethanol and ester

Loan Size\* = 9,545.89 Million Baht



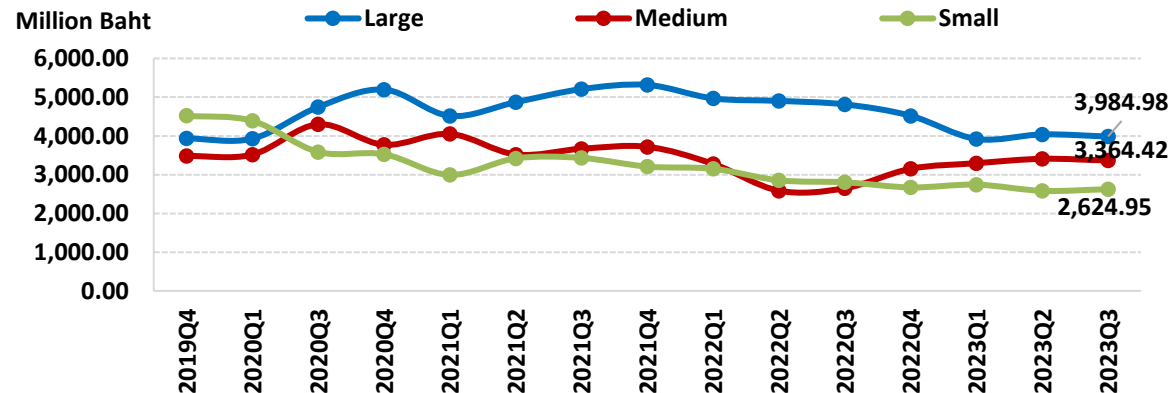
## 20115 : Manufacture of other basic organic chemicals

Loan Size\* = 54,350.28 Million Baht



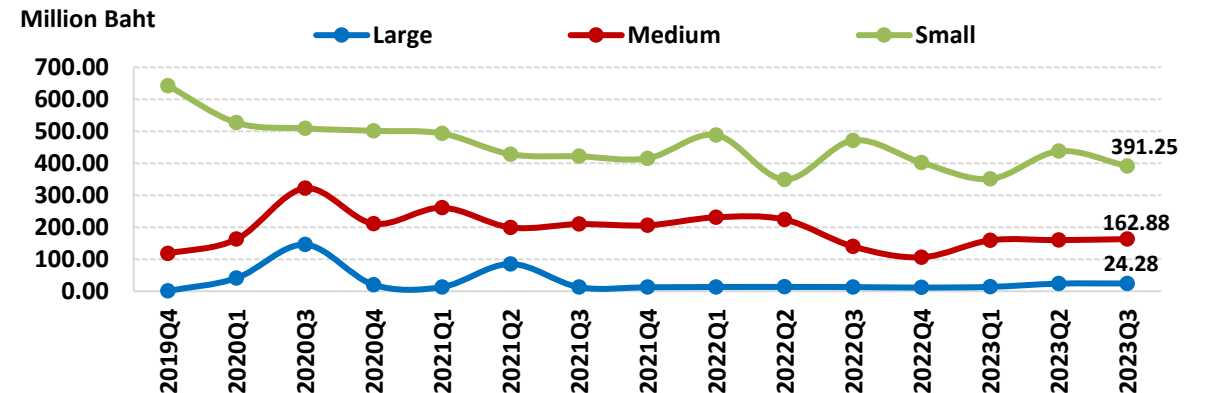
## 21001 : Manufacture of pharmaceuticals, medicinal chemical products

Loan Size\* = 9,974.35 Million Baht



## 21002 : Manufacture of medicinal botanical products

Loan Size\* = 578.41 Million Baht



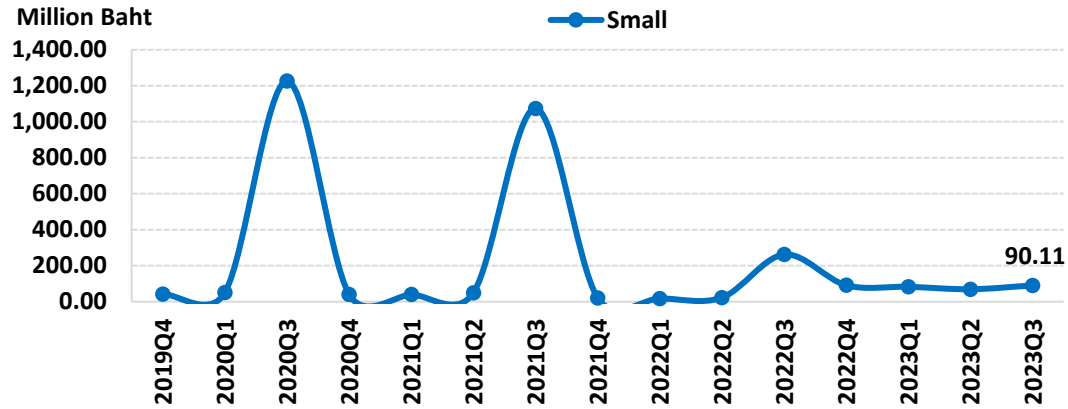
\* Data as of 2023Q3



# Thailand's Biotechnology Industry : Loan Outstanding

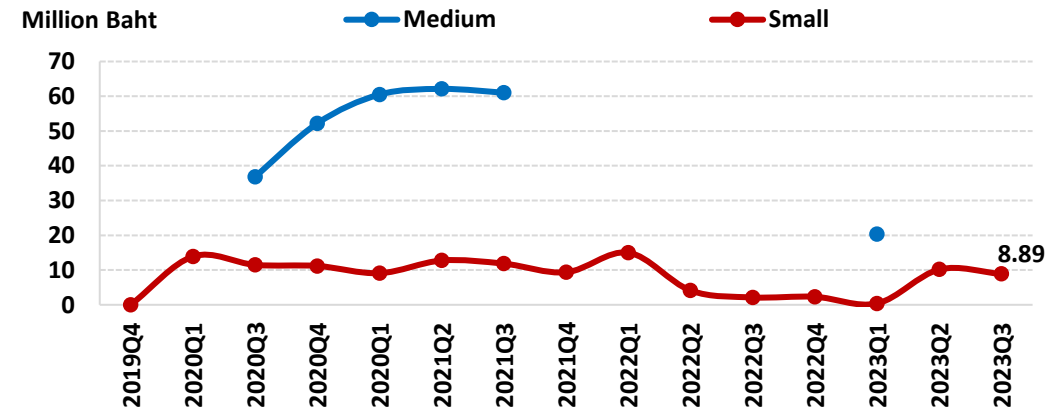
## 72101 : R&D on natural sciences

Loan Size\* = 90.11 Million Baht



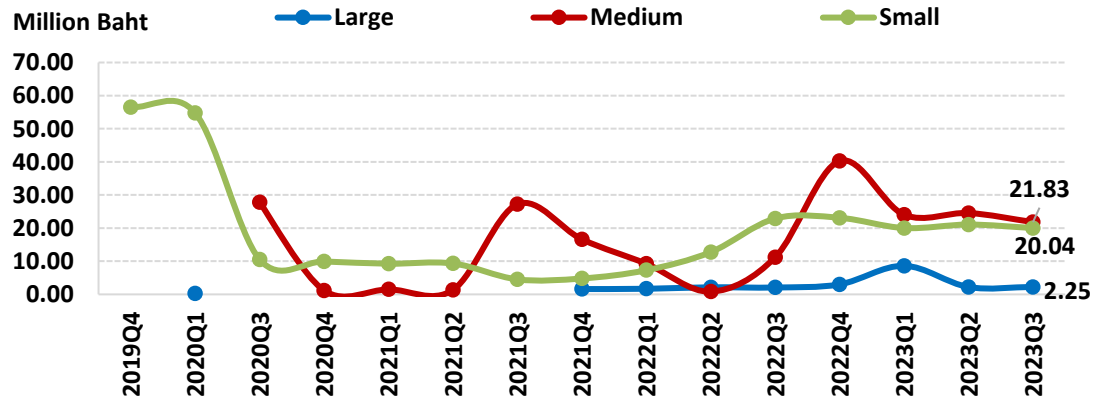
## 72102 : R&D on biotechnology

Loan Size\* = 8.89 Million Baht



## 72109 : R&D on other engineering and technology

Loan Size\* = 44.12 Million Baht



\* Data as of 2023Q3

# End of Presentation

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## Disclaimer

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