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Thailand's Logistics Report 2021






Office of the National Economic and Social Development Council (NESDC)

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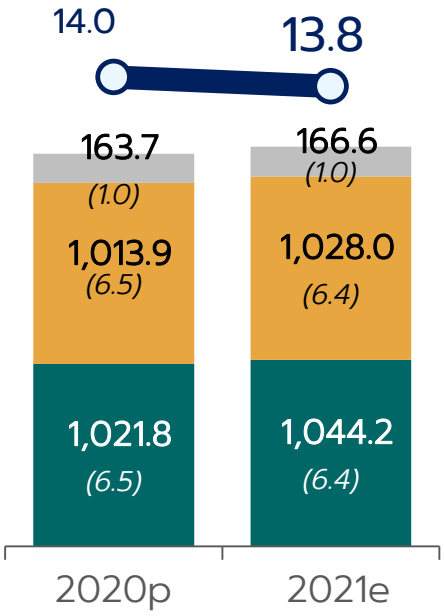
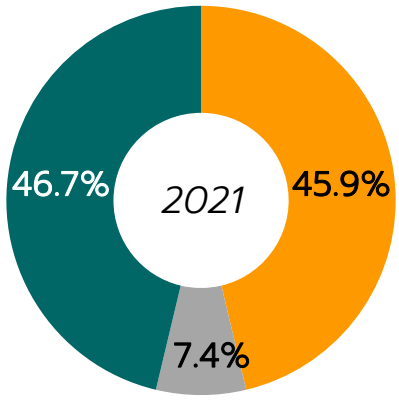
SNAPSHOT

Thailand's Logistics Report 2021



Logistics Cost Structure



Logistics Cost to GDP at Current Prices

13.8

- 0.2% ▼

The logistics cost-to-GDP ratio in 2021 decreases.

The growth rates of GDP are higher than those of logistics cost, partly owing to the improving COVID-19 situation leading to the recovery in tourism and related service sector.

Total Logistics Cost

2,238.8

Billion Baht + 1.8% ▲

Total logistics cost in 2021 rises from last year,

in accordance with the expansion of national economic activities from the relaxation of COVID-19 measures.

Transport Cost Analysis

Shipment Index	Road Freight Transport Index	Shanghai Containerized Freight Index (SCFI)
98.05	101.0	3,792
+ 4.9% ▲	+ 1.6% ▲	+ 209.5% ▲

Overall transport in 2021 rises from last year
as evidence through an increase in both shipment index – reflecting freight volume trends – and road freight transport index and SCFI – reflecting service costs of road and water freight transport (national main modes).

Inventory Holding Cost Analysis

Capacity Utilization Rate	Finished Goods Inventory Index	Inventory Ratio Index
63.0	139.6	152.4
+ 4.8% ▲	+ 8.9% ▲	- 2.7% ▼

Inventorying carrying activities increase from last year
as capacity utilization rate and finished goods inventory index rise reflecting that entrepreneurs increase their production capacity and inventory levels to meet the direction of economic recovery while inventory ratio index declines reflecting improving distribution inventories.

Value Added of Logistics Businesses

480.4

Billion Baht + 6.4% ▲

Value added of logistics businesses grows from last year,
which amounts to 480.4 billion baht or increases by 6.4% from 2020.

Prologue
Executive Summary

Thailand's Logistics Costs

Overview of Thailand's Logistics Cost

- **In 2020, Thailand's logistics costs were 2,199.3 billion baht and equivalent to 14.0% of Gross Domestic Product at Current Prices (Nominal GDP).** The costs declined from the previous year or accounted for a 1.2% decrease, consistent with the national economic contraction as a consequence of the coronavirus disease 2019 (COVID-19) outbreak.

- **In 2021, Thailand's logistics costs are estimated to amount to 2,238.8 billion baht and to equal to 13.8% of Nominal GDP.** The costs increase from last year or account for a 1.81% growth rate, in line with the recovery of national economic activities from relaxed COVID-19 measures, economic stimulus measures, and support measures for tourism businesses along with the global economic recovery leading to export expansion.

Value Added of Logistics Businesses

In 2021, value added of logistics businesses is estimated to be 480.4 billion baht or accounting for an increase of 6.4% owing to rising freight transport demand and entrepreneurial management enhancement to doing business through online channels more effectively.

Logistics Cost-to-GDP Estimates for 2022

Logistics Costs-to-GDP Estimates for 2022 are envisioned to reduce and are expected to be 12.9%-13.3% of GDP. However, potential risk factors that might directly affect the future logistics cost, such as the spread of new COVID variant and Russia-Ukraine conflict, along with a rise in global inflation, oil prices, and shipping charges, should be cautiously assessed.

Global Logistics Costs

Global Logistics Cost to GDP

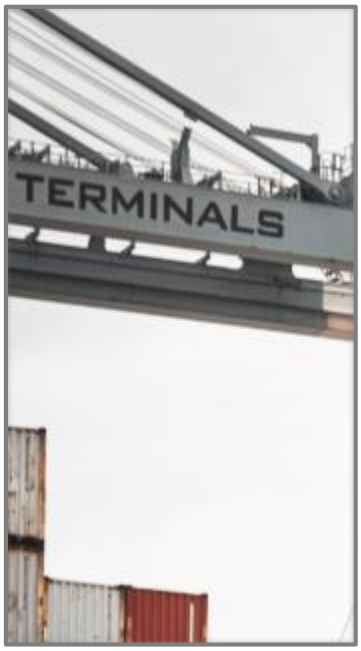
The survey results from Armstrong & Associate Inc., a third-party logistics (3PL) and market-research-consulting expert, reveal that 2020 global logistics cost as a percentage of global GDP was 10.8% while logistics cost to GDP of the Asia-Pacific region was 12.9%.

Agility Emerging Markets Logistics Index (AEMLI)

In 2022, Thailand ranks 8th from 50 countries worldwide, moving up from the 11th in the previous year. It is noteworthy that China still continuously ranks No.1 as China has created an environment conducive to adopt advanced technologies in logistics businesses to effectively support e-commerce businesses.

US Logistics Costs

In 2021, US logistics costs are 1,847 billion USD, a 22.4% increase from last year, or equal to 8.03% of GDP. The expansion of economic activities that leads to higher transport and inventory demand resulting in the congestion in supply chain, coupled with rising freight prices, affects an increase in both transport cost, and inventory carrying cost.



Recommendations and Way Forward

A Summary of Logistics Development Guidelines from (Draft) Action Plan on Thailand Logistics Development 2023-2027

1 Infrastructure and Logistics Facility Improvement

By building water, rail, road and air transport and logistics networks to connect with economic areas (i.e. economic zones, industrial parks, potential border crossing points) and neighboring countries, developing logistics centers, formulating consistent management guidelines for existing infrastructure and logistics centers to support national freight transport, promoting digital technology utilization to improve logistics service efficiency, and engaging more local and private participation in transport investments and services

2 Standard Improvement and Value Chain Enhancement

By encouraging the use of technology, innovation, information technology system and software in supply chain management, improving access to various market channels for agriculturists, developing entrepreneurial ecosystems for SMEs, such as promoting access to funding, becoming environmentally responsible, encouraging Thai entrepreneurs to invest abroad, and assigning a responsible agency to manage value chain of major agricultural goods

3 Improvement of Customs Clearance Procedures and International Transport Facilitation

By accelerating the full usage of NSW system, extending the NSW system to support electronic transactions and information exchange with other systems, creating single e-form to provide single entry services, fostering cooperation and removing barriers to international transport, streamlining related laws and regulations to facilitate international transport, and preparing a risk management plan for the times of crisis

4 Capability Enhancement of Thai Logistics Service Providers

By supporting the use of technology, innovation and digital platform to enhance services and access to databases and knowledge, promoting Thai logistics service providers to provide standardized, modern, green, and one-stop service, and promoting investment and establishment of cooperation network in the country and region

5 Innovative R&D Enhancement, Logistics Personnel Capacity Building, and National Logistics Evaluation

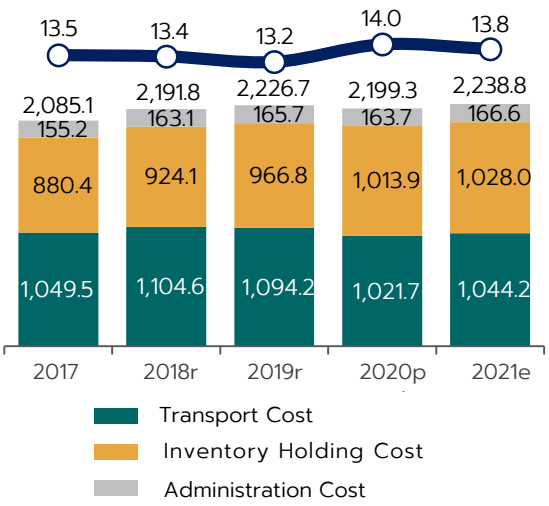
By promoting technological and innovative R&D projects, investment and application in logistics for domestic use, improving training courses emphasizing technology skills, and improving logistics database to monitor and evaluate logistics development

Part 1

Thailand's Logistics Costs

1. Logistics Cost Overview

Figure 1 Thailand's Logistics Cost (Billion Baht)



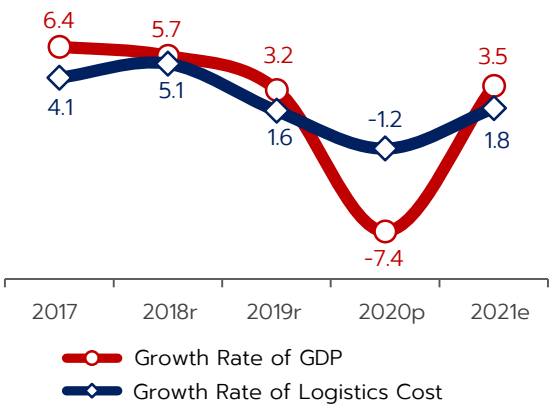
Remark: r (revised) refers to revised data.
p (preliminary) refers to preliminary data.
e (estimated) refers to estimated data.

Source: Logistics Development Strategy Division, NESDC

In 2020, Thailand's logistics cost was 2,199.3 billion baht declining from 2,226.7 billion baht in 2019 – which accounted for a 1.2% fall - or **equivalent to 14.0% of Gross Domestic Product at Current Prices (Nominal GDP).** The total cost included 1,021.8 billion baht of transport cost (or equal to 6.5% of GDP), 1,013.9 billion baht of inventory holding cost (or equal to 6.5% of GDP), and 163.7 billion baht of logistics administration cost (or equal to 1.0% of GDP). The cost reduction was in accordance with the cessation of national economic activity as a consequence of the spread of COVID-19. The negative growth rates of GDP were higher than those of logistics costs, partly owing to tourism and other service sectors severely affected by COVID-19.

In 2021, Thailand's logistics cost is estimated to amount to 2,238.8 billion baht increasing from 2020 – a 1.8% rise - or **equal to 13.8% of GDP** – which decreases from last year. The total cost includes 1,044.2 billion baht of transport cost (or equal to 6.4% of GDP), 1,028.0 billion baht of inventory holding cost (or equal to 6.4% of GDP), and 166.6 billion baht of logistics administration cost (or equal to 1.0% of GDP). The cost expansion is due to the recovery of national economic activity from relaxed COVID-19 measures and vaccine distribution progress along with economic stimulus measures and support measures for tourism businesses. As a result, domestic demand increases. With global economic recovery, private consumption and investment, and export to major trading partners also begin to revive.

Figure 2 Trends of Logistics Cost and GDP at Current Prices (%)

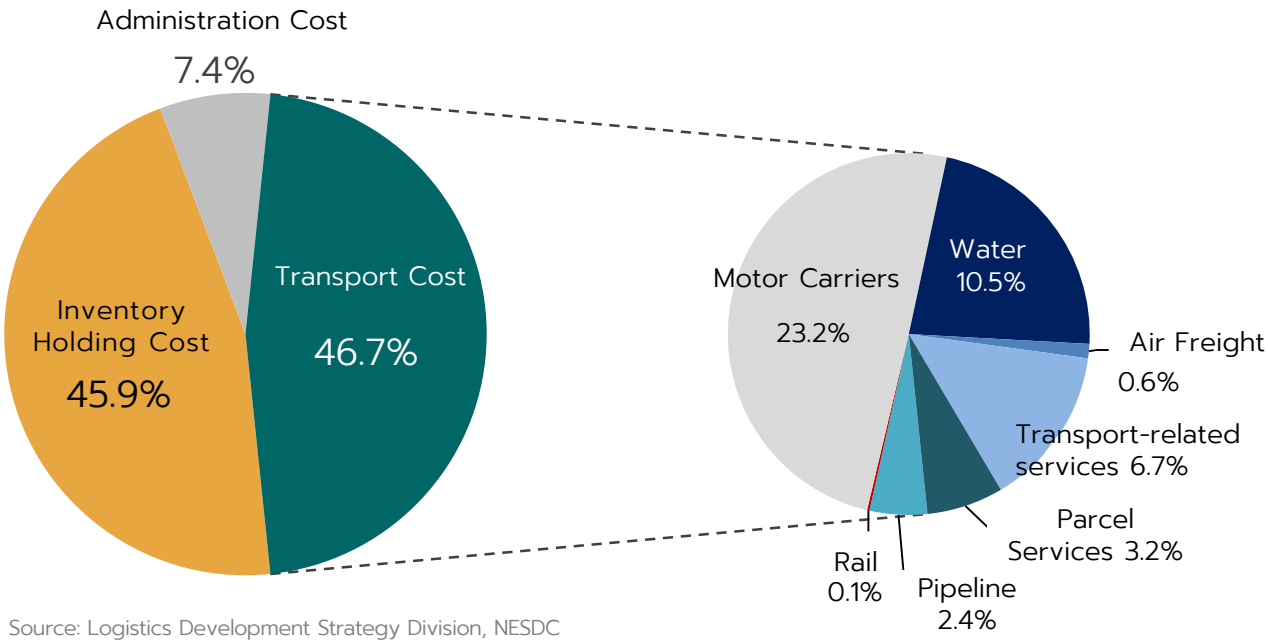


Source: Logistics Development Strategy Division, NESDC

2. Logistics Cost Structure

In 2021, transport cost as the largest cost component, replacing inventory holding cost last year, is partly due to factors influencing freight prices, such as rising oil price and shipping charges, along with an increase in transport activity. The transport cost contributes to 46.7% of total logistics cost, followed by the inventory holding cost accounting for 45.9%, while the logistics administration cost remains unchanged at 7.4%.

Figure 3 Logistics Cost Structure

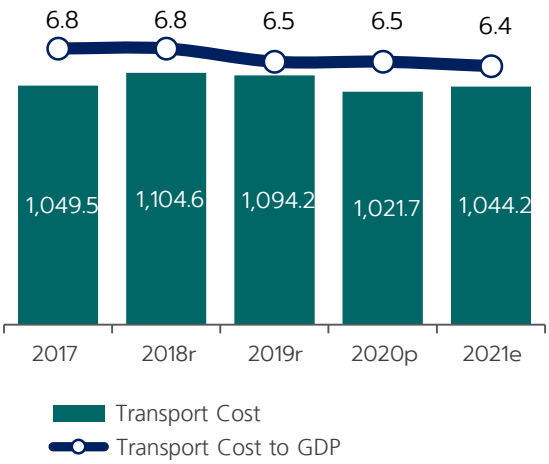


Source: Logistics Development Strategy Division, NESDC

3. Logistics Cost Components

3.1 Transport Cost

Figure 4 Transport Cost (Billion Baht)



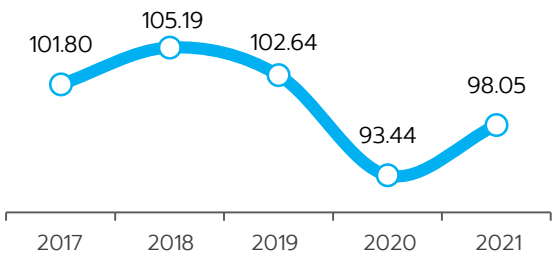
Source: Logistics Development Strategy Division, NESDC

In 2021, transport cost accounts for 6.4% of GDP or amounts to 1,044.2 billion baht growing from 1,021.8 billion baht in 2020, or a 2.2% increase. The rising cost is due to overall freight volume expansion and other freight transport factors in accordance with national and global economic trends. More detail is provided in the following section.

1) Transport Activity

Overall freight volumes in 2021 rise from last year. The shipment index is 98.05 increasing from 93.44 in 2020, or a 4.94% rise, owing to national economic recovery. The analysis is provided below.

Figure 5 Shipment Index

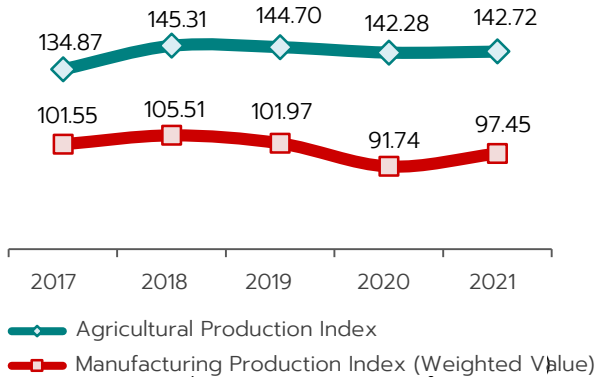


Source: The Office of Industrial Economics, and Ministry of Industry

● Rising Industrial Production

Overall industrial production level in 2021 is higher than last year. The agricultural production index is 142.72 growing from 142.28 in 2020 – or a 0.31% growth – especially in fruits, vegetables, mung bean, cassava, sugarcane, pineapple, and palm oil. And, the manufacturing production index is 97.45 rising from 91.74 in 2020 - or a 6.23% rise - especially in motor vehicles, furniture, jewelry, electronics, leather, and rubber.

Figure 6 Agricultural and Manufacturing Production Index

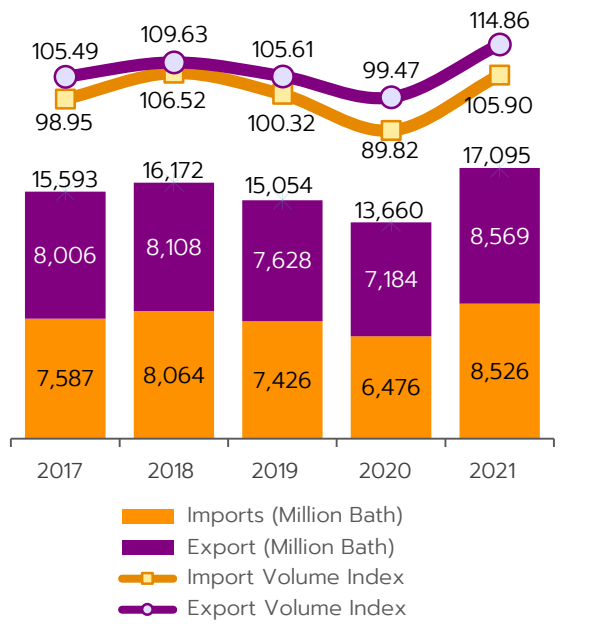


Source: Office of Agricultural Economics, Ministry of Agriculture and Cooperatives and The Office of Industrial Economics, Ministry of Industry

● International Trade Expansion

Overall volume and value of both imports and exports in 2021 increase from last year. The import volume index is 105.90 rising from 89.82 in 2020 – or a 17.90% rise. And, the export volume index is 114.86 increasing from 99.47 in 2020 – or a 15.47% increase. Additionally, the value of Thai foreign trade is approximately 17,095 billion baht rising from 13,660 billion baht in 2020 – or a 25.14% growth - especially in major country groups, namely, ASEAN, People's Republic of China, the European Union, the Middle East, and BIMSTEC.

Figure 7 Import and Export Volume Index

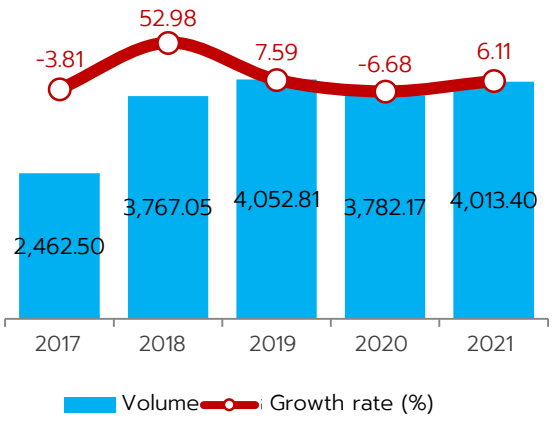


Source: Ministry of Commerce and Bank of Thailand

Freight Shipments by Mode

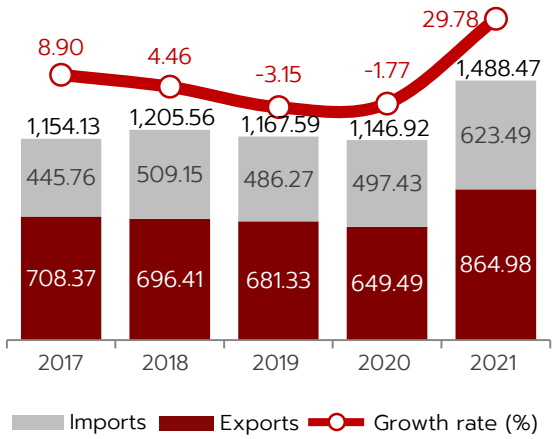
Road freight transport shows an increasing trend owing to rising production volumes after a slowdown in the first phase of the COVID-19 and partly from the continuous growth of e-Commerce businesses. As consumers buying products online tend to increase continuously, such a trend causes rising last-mile delivery demand. In 2021, Thai e-commerce market is valued at 4,013.40 billion baht, increasing from 3,782.17 billion baht in 2020, or equal to a 6.11% growth rate. Likewise, relaxed import-export restriction measures cause the expansion of the border trade and cross-border trade value. In 2021, the value is amounted to 1,488.47 billion baht, rising from 1,146.92 billion baht in 2020, or equivalent to a 29.78% rise.

Figure 8 E-Commerce Market Value (Billion Baht)



Source: Electronic Transactions Development Agency (ETDA)

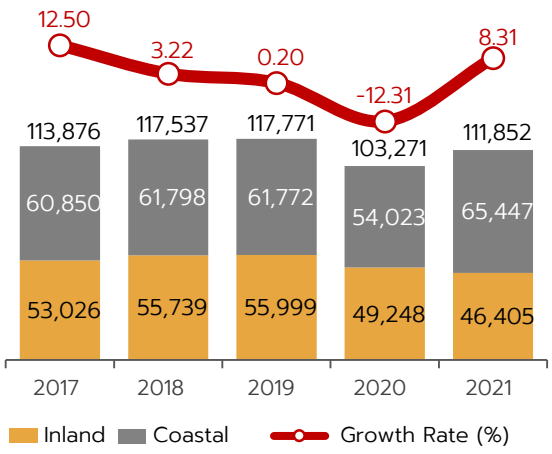
Figure 9 Border Trade and Cross-border Trade Value (Billion Baht)



Source: Department of Foreign Trade, and Ministry of Commerce

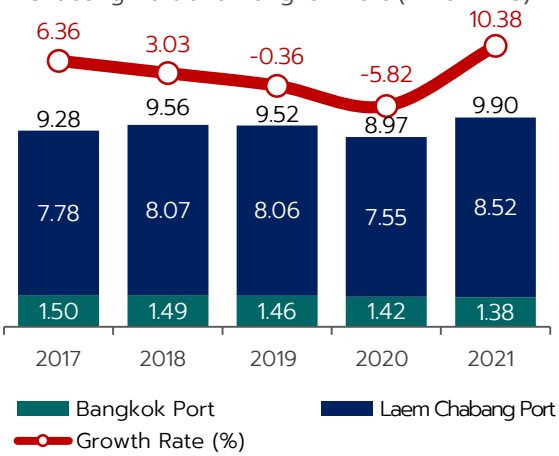
Water freight transport shows a rising trend. In 2021, domestic water freight volumes are 111,852 thousand tons rising from 103,271 thousand tons in 2020, or equivalent to a 8.31% increase. Meanwhile, Laem Chabang port and Bangkok port as Thailand's international ports handle 9.90 million TEU rising from 8.97 million TEU in 2020, or equal to a 10.38% rise, owing to import-export restrictions reduction of the trading partners and product demand increase.

Figure 10 Domestic Water Freight Volumes (Thousand Tons)



Source: Marine Department Processed by Ministry of Interior and Office of Transport and Traffic Policy and Planning

Figure 11 Container Port Volumes of Laem Chabang Port and Bangkok Port (Million TEU)

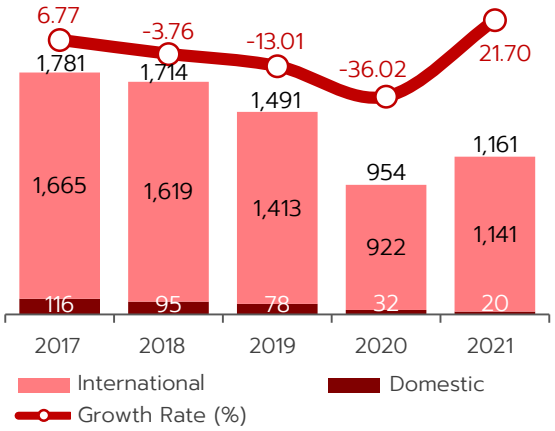


Source: Port Authority of Thailand

● Freight Shipments by Mode (Cont.)

Air freight transport shows a growing trend. In 2021, overall air freight transport has a volume of 1,161 thousand tons rising from 954 thousand tons in 2020, or a 21.70% rise. Such a rise is due to rising international freight volumes. There is still high global freight demand. Besides, restrictions on freight transport during COVID-19 are less than passenger transport leading to air freight transport recovery. However, domestic freight volumes slightly decline partly because of flight reduction causing some business operators to shift to other modes.

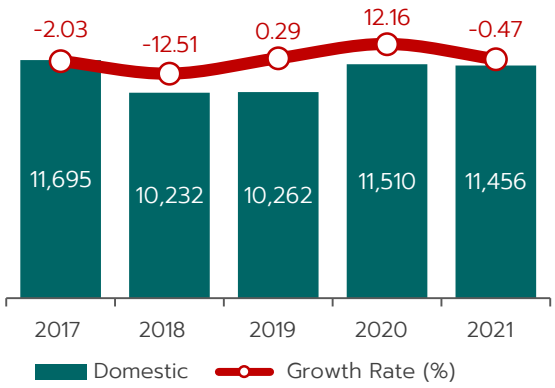
Figure 12 Air Freight Volumes (Thousand Tons)



Source: Civil Aviation Authority of Thailand

Meanwhile, **rail freight transport** in 2021 has a volume of 11,456 thousand tons, falling from 11,510 thousand tons in 2020, or equivalent to a 0.47% decline. Overall domestic rail transport is relatively similar compared to the previous year. This is partly due to the rail infrastructure and major transshipment facilities still under development to enable seamless freight transport. The growth of e-Commerce requires convenient and faster delivery to consumers. Thus, operators view that rail transport is unable to respond to last-mile delivery needs because of limited types of goods able to be shipped by rail.

Figure 13 Rail Freight Volumes (Thousand Tons)

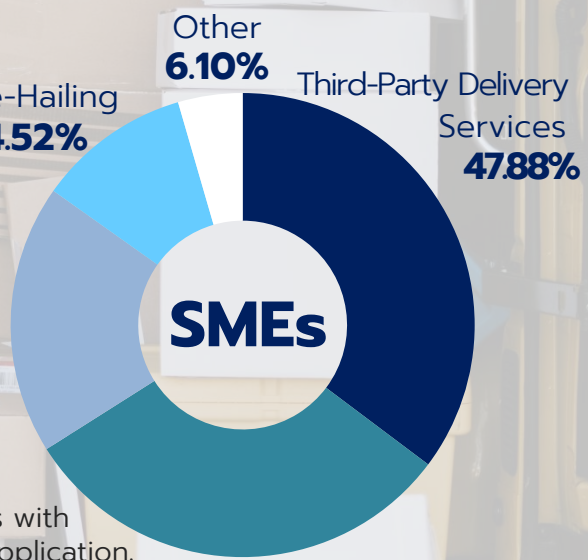


Source: State Railway of Thailand and the Customs Department Processed by Ministry of Transport

LOGISTICS INSIGHT 1: E-Commerce Businesses and Delivery Channels

The proportion of domestic delivery usage of small business e-commerce companies in 2020.

Factors affecting the decision of SMEs to select delivery channels include delivery fees, number of delivery points, and reliability.



Ride-hailing is a company matching deliverers with users through its platform or application.

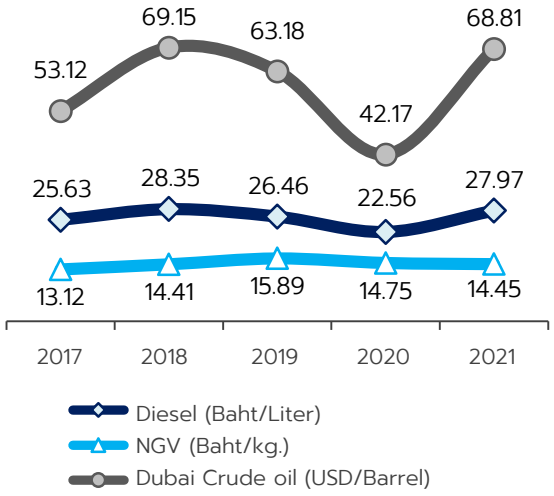
Source: Electronic Transactions Development Agency

2) Freight Charge Factor and Index

● Rising Oil Price

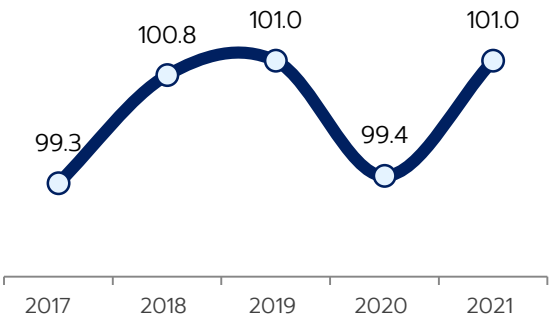
An average retail oil price in 2021 is at 27.97 baht/liter rising from 22.56 baht/liter in 2020, or equal to a 23.98% increase. Such an increase is in accordance with rising global oil prices owing to economic activity recovery causing oil demand to increase. Meanwhile, an average NGV price in 2021 is at 14.45 baht/kg. declining from 14.75 baht/kg., or equivalent to a 2.03% fall, partly because of government regulations on NGV price ceilings.

Figure 14 Average Retail Fuel Price



Source: Bank of Thailand and Federal Reserve Economic Data

Figure 15 Road Freight Transport Index



Source: Trade Policy and Strategy Office, and Ministry of Commerce

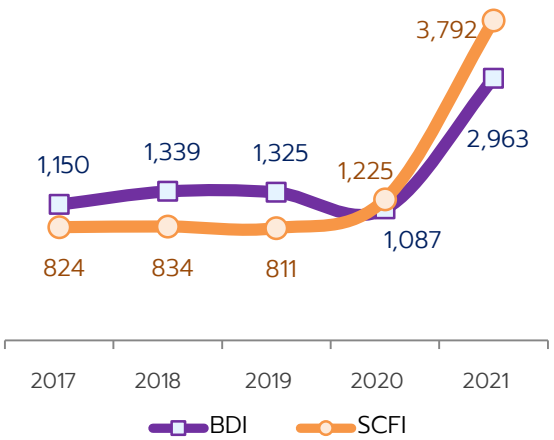
● Surging Road Freight Transport Index

Annual Road Freight Transport Index (RFTI) in 2021 is at 101.0 rising from 99.4 in 2020, or equivalent to a 1.6% rise. The RFTI increases quarterly owing to rising oil price, transport demand increase from the expansion of manufacturing, and exports and imports of main goods, namely electrical appliances, coal and lignite, metal products, food products, textiles, and petroleum products.

● Continuously Rising Shipping Index

Shipping Index in 2021 includes Baltic Dry Index (BDI), a proxy for an average dry bulk shipping cost, is at 2,963 USD increasing by 172.6%, and Shanghai Containerized Freight Index (SCFI), a proxy for an average container shipping cost, is at 3,792 USD rising by 209.5%. Such increases occur as many countries start to relax COVID-19 measures. Also, the economy begins to recover leading to higher goods demand. As a result, operators require more space and shipping containers. Rising oil prices also cause a continuous increase in shipping charges.

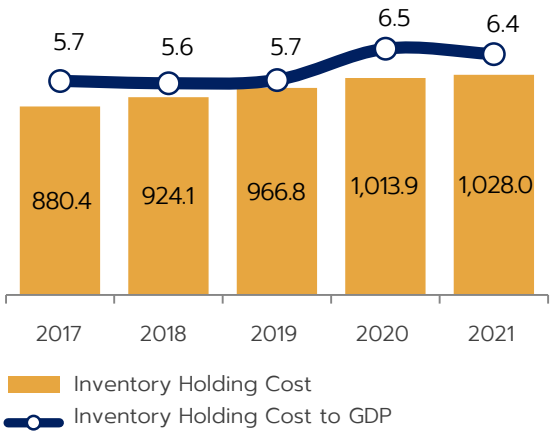
Figure 16 Shipping Index



Source: www.tradingeconomics.com and Shanghai Shipping Exchange (SSE)

3.2 Inventory Holding Cost

Figure 17 Inventory Holding Cost



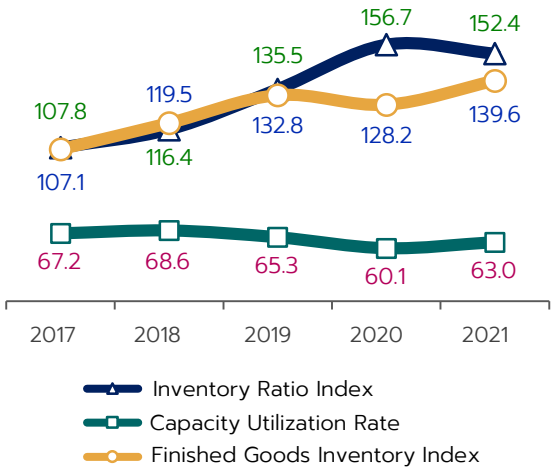
Source: Logistics Development Strategy Division, NESDC

In 2021, inventory holding cost accounts for 6.4% of GDP or amounts to 1,028.0 billion baht growing from 1,013.9 billion baht in 2020, or a 1.4% increase. The cost comprises 824.9 billion baht of inventory carrying cost (increasing from 815.7 billion baht in 2020 or a 1.1% increase) and 203.1 billion baht of warehousing cost (rising from 198.2 billion baht in 2020 or a 2.5% increase). Factors affecting the inventory holding costs are summarized below.

1) An Increase in Inventorying Carrying Activities

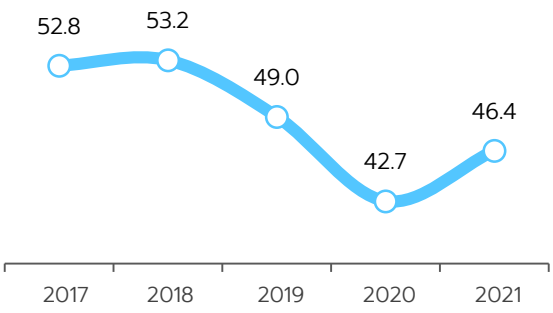
In 2021, capacity utilization rate is 63.0 increasing from 60.1 in 2020 and **finished goods inventory index is 139.6** rising from 128.2 in 2020. Such increases reflect that entrepreneurs increase their production capacity in line with production growth leading to higher inventory levels after witnessing a sign of economic recovery. However, **inventory ratio index is 152.4** decreasing from 156.7 in 2020. Such a decrease reflects that the entrepreneurs can better manage existing inventory as national economic activities continue to expand.

Figure 18 Industrial Indices



Source: The Office of Industrial Economics, Ministry of Industry

Figure 19 Business Sentiment Index (Manufacturing)



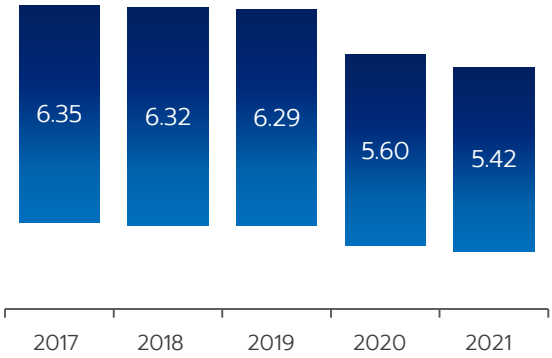
Source: Bank of Thailand

Meanwhile, Manufacturing Sentiment Index (MSI) – reflecting the confidence of entrepreneurs to the economy – in 2021 has an increasing trend. The MSI has an average of 46.9 rising from 43.7 in 2020.

2) Decreased Minimum Lending Rate (MLR)

The 2021 Minimum Lending Rates (5.42%) are lower than those of the previous year. The trend is in line with the policy of the Monetary Policy Committee (MPC) which intends to utilize expansionary monetary policy to support national economic recovery under global economic and fiscal uncertainty. Other fiscal measures to support entrepreneurs in response to COVID-19 include soft loans, rehabilitation loans, and asset warehousing as financial rehabilitation measures to maintain SMEs liquidity.

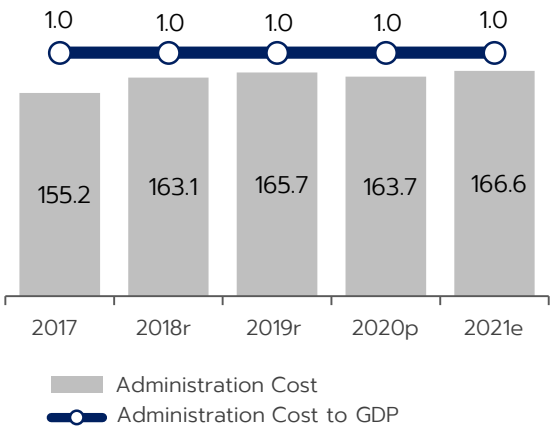
Figure 20 Minimum Lending Rate (MLR)



Source: Bank of Thailand

3.3 Logistics Administration Cost

Figure 21 Logistics Administration Cost



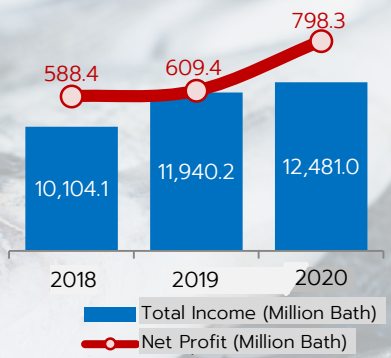
Source: Logistics Development Strategy Division, NESDC

In 2021, logistics administration cost is equivalent to 1.0% of GDP or amounts to 166.6 billion baht increasing from 163.7 billion baht in 2020, or a 1.8% increase. (This logistics administration cost calculation is based on the study results from The Improvement of Thailand's Logistics Cost Calculation Model by NESDC (2019) that logistics administration cost employs 8.04% of total transport cost and inventory holding cost).

LOGISTICS INSIGHT 2: Refrigerated Transport and Warehouses

Chilled and frozen warehousing and transport businesses have experienced the continuous growth during COVID-19 partly owing to rising consumer behavior preferring ready-to-eat meals and cooking at home. Such chilled and frozen foods have long-shelf life and give consumers convenience and reduction of risk in community settings.

A total of **376** persons
Registered capital of **฿11,799.53** million
(data as of 30 April 2022)



Thailand Standard Industrial Classification: TSIC 2009

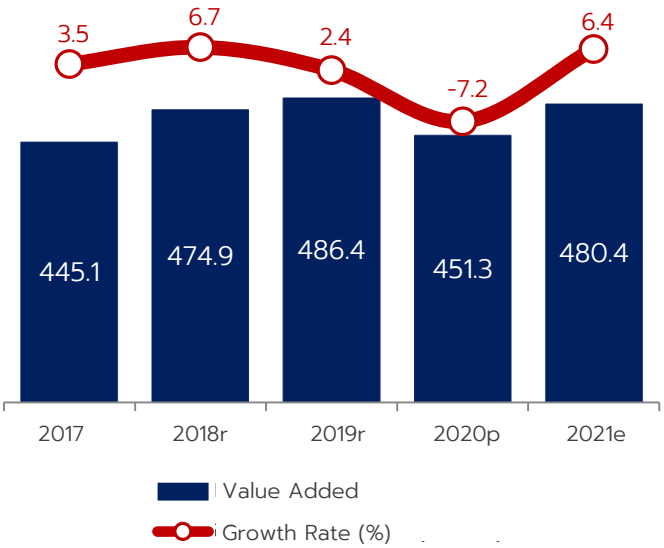
49331: Road transport services of freight by refrigerator vehicles
Road transport of chilled or frozen goods by refrigerated trucks or vehicles

52101: Refrigerated storage activities
storage and warehousing services for refrigerated or frozen products, and perishable goods

Source: Department of Business Development, Ministry of Commerce

4. Value Added of Thailand's Logistics Businesses

Figure 22 Value Added of Logistics Businesses



Source: Logistics Development Strategy Division, NESDC

Concept/Calculation

Value Added of Logistics Businesses defines as the economic profit of a business in logistics service industry gained from the exploitation of logistics-related activities incurred within the country

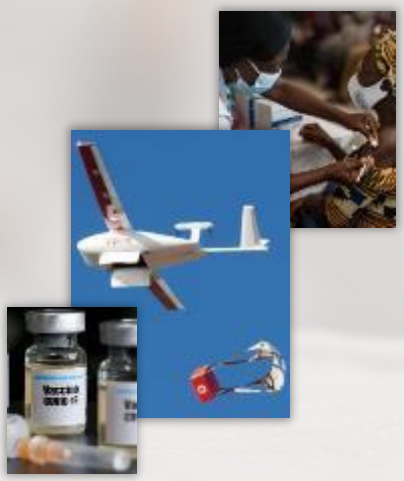
VA of Logistics Businesses = Gross Output – Intermediate Costs

In 2021, value added of Thai logistics businesses expands. The value added is 480.4 billion baht, rising from 451.3 billion baht in 2020, or a 6.4% rise. Such a rise is due to the relaxation of international travel restrictions and import-export controls during the COVID-19 outbreak in many countries worldwide, including Thailand. As a result, the global economy and national economy improve. Besides, the driving force of the government's economic stimulus measures leads to the recovery in the service and tourism sector. The continuous export expansion causes operators to produce their products and increase their inventories. As consumer behavior has increasingly purchased products online, e-Commerce businesses continue to grow. Entrepreneurs have also adopted modern digital technology to enhance their services and business operations, resulting in rising value added in logistics activities and logistics business in Thailand.

LOGISTICS INSIGHT 3: Innovative COVID Vaccine Delivery in Ghana

Zipline, a medical drone delivery company, cooperates with BioNTech and Pfizer to design packaging to deliver COVID vaccines in Ghana. The packaging can keep the vaccine at 36 – 46 degrees Fahrenheit for up to 4 hours. Its drone delivery can access to remote areas within 80 km. with a maximum speed of 100 km/h., as well as reduce logistics cost better than the usual method. During late 2021, more than 250,000 doses of the COVID vaccines have been shipped and more than 40 percent of Ghana's population has already received the vaccines.

Source: www.fastcompany.com



5. Logistics Cost-to-GDP Estimates for 2022

From late 2021 to mid-2022, national economy has been experiencing growth continuously owing to the relaxed COVID-19 control measures, accelerated vaccine rollout and government's economic stimulus measures, along with the global economic recovery. The revived economic activities cause the growth of private consumption and investment, and exports to major trading partners. As a result, freight transport demand increases. Likewise, Thailand's logistics costs in 2022 are envisioned to fall. Logistics costs to GDP in 2022 are expected to be 12.9% - 13.3%. Still, potential risk factors that might directly affect the future logistics cost, such as the spread of new COVID variant or new pandemic, Russia-Ukraine conflict, and rising global inflation (central banks will then raise interest rates), along with the rising oil prices and shipping charges, should be cautiously assessed.

Table 1 Thailand's Logistics Cost-to-GDP Estimates

Detail	Actual Data				Projection for 2022
	2020	2021	Q1/2022	Q2/2022	
Thailand's Logistics Cost to GDP at Current Prices /1	14.0 (p)	13.8 (e)	-	-	12.9-13.3
GDP Growth (CVM, %) /2	-6.2	1.5	2.3	2.5	2.7 - 3.2
World Economic Growth (%) /2	-3.1	5.3	-	-	3.3
World Trade Volume (%) /2	-7.9	10.1	-	-	4.3
Dubai Crude Oil (USD/Barrel) /2	42.4	69.5	96.5	108.9	95.0-105.0
Shanghai Containerized Freight Index (SCFI) /3	51.1	209.5	3.26	-13.2	-
Manufacturing Production Index /4	91.7	97.5	104.6	95.1	-
Shipment Index /4	93.4	98.1	103.8	97.8	-
Finished Goods Inventory Index /4	128.2	139.6	138.9	134.6	-
Road Freight Transport Index /5	99.4	101.0	104.2	108.4	-
Minimum Lending Rate (MLR) /6	5.41-5.78	5.25-5.58	5.25-5.58		-

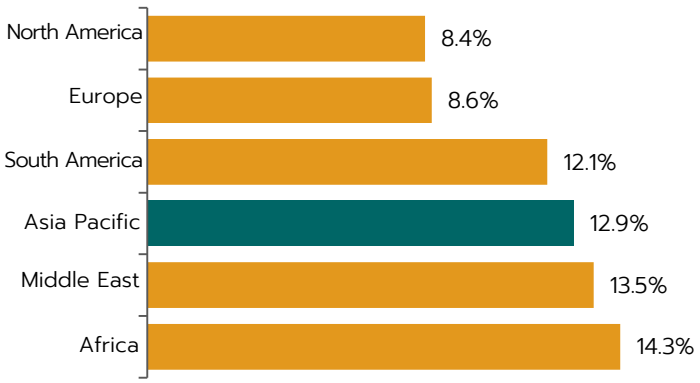
Source: /1 Logistics Development Strategy Division, NESDC
/2 The Thai Economy in Q2/2022 and the Outlook for 2022 as of 15 August 2022, NESDC
/3 Shanghai Shipping Exchange (SSE)
/4 The Office of Industrial Economics, Ministry of Industry
/5 Economic and Trade Indices Database (ETID)
/6 Bank of Thailand

Part 2

Global Logistics Costs

1. Global Logistics Costs to GDP

Figure 23 Logistics Costs to GDP (%) in 2020 by Regions

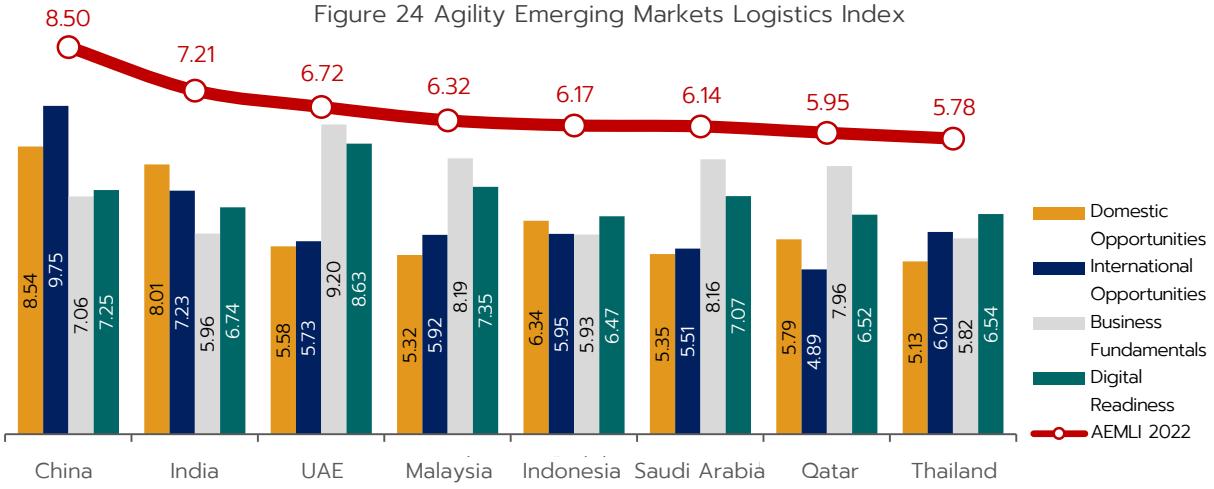


Source: Armstrong & Associates

The survey results from Armstrong & Associate Inc., a third-party logistics (3PL) and market-research-consulting expert, reveal that 2020 global logistics cost as a percentage of global GDP was 10.8% rising from 10.7% in 2019. North America and Europe had the least logistics costs as a percentage of GDP accounting for 8.4% and 8.6% consecutively while the Asia-Pacific region had logistics cost to GDP of 12.9% increasing from 12.8%.

2. Agility Emerging Markets Logistics Index : AEMLI

Figure 24 Agility Emerging Markets Logistics Index



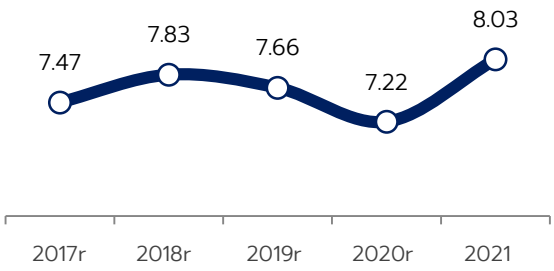
Source: www.agility.com

Agility Co., Ltd., a global logistics expert, in 2022, has added "Digital Readiness" as a critical factor in doing business under the recovery from the COVID-19 pandemic in the Agility Emerging Markets Logistics Index (AMELI). The result reveals that the People's Republic of China (China) and India rank 1st and 2nd consecutively while Thailand ranks 8th from 50 countries worldwide improving from 11th last year. It is noteworthy that China still continuously ranks No.1 as China has created an environment conducive to adopt advanced technologies in logistics businesses to effectively support e-commerce businesses.

3. US Logistics Cost

Annual State of Logistics Report 2022 by The Council of Supply Chain Management Professionals (CSCMP) and Kearney reveals that total US logistics cost in 2021 is around 1,847.0 billion USD (a 22.4% increase from last year) or equal to 8.03% of GDP rising from 7.22% of GDP in 2020 as summarized below.

Figure 25 Logistics Cost to GDP of the United States of America



Source: CSCMP's 33rd Annual State of Logistics Report 2022

3.1 Transport Cost

Transport cost, the largest cost component, amounts to approximately 1,205.7 billion USD (a 21.7% rise from last year), consisting of:

Motor Carriers as the largest cost component in the transport sector rise at 23.4% owing to higher production levels after a slowdown in the 1st phase of COVID-19 outbreak.

Parcel rises at 15.2% as a consequence of changing the way of life from social distancing and work-from-home policy causing the continuous growth of e-commerce businesses and last-mile delivery.

Rail increases at 18.8% as both freight volumes and factors affecting freight charges rise from last year.

Pipeline grows at 18.2% because of expense associated with more restricted measures, including environment and climate change.

Water has the highest growth rate accounting for 26.3% owing to higher international freight charges as a result of space constraints and port congestion inability to meet the growing demand.

Air freight expands by 19.2% as some business operators shift from using water to air freight transport services.

Table 2 Total Logistics Cost of USA
(Billion USD)

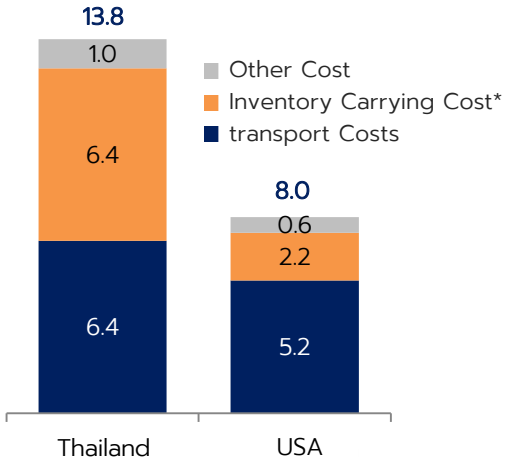
Logistics Cost (Billion USD)	Value		YoY (%)
	2020r	2021	
Transport Cost	990.9	1,205.7	21.7
Motor Carriers	672.9	830.5	23.4
Parcel	116.8	134.5	15.2
Rail	74.3	88.3	18.8
Air Freight	44.2	52.7	19.2
Water	25.7	32.4	26.3
Pipeline	56.9	67.3	18.2
Inventory Carrying Cost	398.2	501.3	25.9
Other Costs	120.1	140.0	16.6
Total	1,509.0	1,847.0	22.4

Source: CSCMP's 33rd Annual State of Logistics Report 2022

3.2 Inventory Carrying Cost

Inventory carrying cost is about 501.3 billion USD (a 25.9% increase from last year). Such an increase is due to high consumer-demand volatility and faster delivery services leading entrepreneurs to locate warehouses near the city causing higher warehouse construction cost. Regarding financial support measures, the government provides Economic Injury Disaster Loan (EIDL) and Paycheck Protection Program (PPP) that give non-payment loans to businesses that meet the Small Business Administration (SBA)'s requirements to prevent unemployment and to keep business running during COVID-19.

Figure 26 Logistics Cost Ratio of Thailand and the United States of America in 2021



Source: Logistics Development Strategy Division, NESDC
Remark: *Thailand refers to inventory holding cost, the sum of inventory carrying cost and warehousing cost.

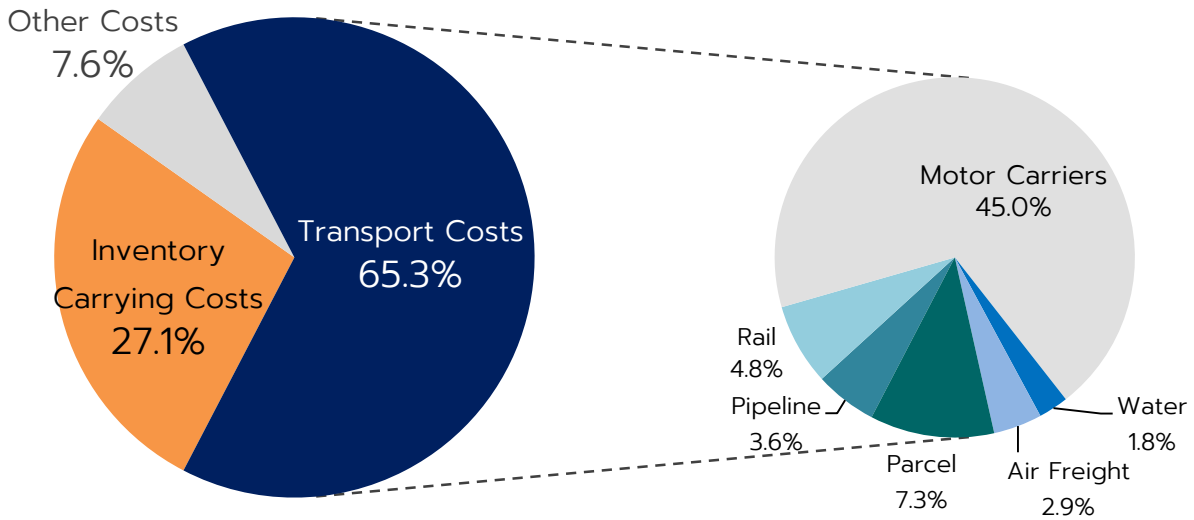
3.3 Other Costs

Other costs, including carriers' support activities and shippers' administrative costs, are approximately 140.0 billion USD (a 16.6% rise from last year), which aligns with overall growing logistics costs.

3.4 US Logistics Cost Structure

US logistics cost consists of transport cost accounting for 65.28% of total logistics cost, inventory carrying cost for 27.14%, and other costs for 7.58% consecutively. The transport cost is the largest cost component as road freight transport remains the dominant mode.

Figure 27 US Logistics Cost Structure in 2021



Source: CSCMP's 33rd Annual State of Logistics Report 2022

Part 3

Recommendations and Way Forward

During the years of COVID-19, the proportion of Thailand's logistics cost to GDP is greater than one in the usual situation: transport cost and inventory holding cost are similar in both values and proportion. Thus, the way forward is to emphasize entrepreneurial management upgrade to reduce inventory holding cost along with developing and driving the utilization of infrastructure, logistics facilities, and supporting factors through the use of technology and innovations to enhance logistics management efficiency. Also, Office of the National Economic and Social Development Council and other related agencies formulate **(Draft) Action Plan on Thailand Logistics Development 2023-2027**, a framework for logistics system development in the next 5 years, to enable *the logistics system as the main mechanism for driving Thailand into a major trade gateway for the sub-regions and regions*. Guidelines of the Action Plan are summarized below.

1 Infrastructure and Logistics Facility Improvement

1.1 Build comprehensive water, rail, road and air transport and logistics network to connect with economic zones, industrial parks, and potential border crossing points through developing intercity transport routes and double-track railways by prioritizing based on urgency, and emphasizing connectivity within neighboring countries and regions, improving and efficiently utilizing ports, along with supplying sufficient equipment and facilities, and improving potential regional airports to serve as air cargo centers

1.2 Develop logistics centers and improve potential border crossing points by developing logistics centers to be regional transport centers and intermodal transport, and upgrading potential border crossing points to support transport facilitation

1.3 Manage existing infrastructure and logistics centers by formulating consistent management guidelines for existing infrastructure and logistics centers to support national freight transport, promoting rail and water transport, engaging more local and private participation in project development in line with area development and needs, and promoting private participation as transport service providers

1.4 Promote the utilization of digital technology advancement by encouraging infrastructure service providers and government agencies to utilize digital technology to develop and improve logistics-related services

2 Standard Improvement and Value Chain Enhancement

2.1 Improve logistics and supply chain management in the agriculture sector by helping with academia and funding in applying technology innovation to manufacturing process and logistics management, encouraging agriculturists to minimize waste from logistics activities, improving access to various and effective marketing channels and assigning a responsible agency to manage value chain of major agricultural goods

2.2 Nurture entrepreneurial ecosystems in the industrial sector by encouraging the use of technology, innovation, information technology system and software in supply chain management, especially to enhance production efficiency, warehouse management and green and social business model development, supporting the development of new marketing channels, especially e-commerce, and continuously supporting access to appropriate sources of funding and engaging Thai entrepreneurs to invest abroad

2.3 Become environmentally responsible by promoting energy efficiency and reducing greenhouse gas emissions, and implementing policy promoting utilization of alternative energy, namely biofuel and natural gas, in the supply chain

3 Improvement of Customs Clearance Procedures and International Transport Facilitation

3.1 Develop data linkages and accelerate the full usage of the National Single Window (NSW) system by improving the NSW system to support data linkages with other systems, namely National Digital Trade Platform (NDTP) and Port Community System (PCS), pushing electronic data integration between ASEAN and Non-ASEAN member states via the ASEAN Single Window (ASW) and promoting the full utilization of NSW system

3.2 Promote paperless custom clearance processes by simplifying import and export procedures and information linkages of permits and certificates of main products, harmonizing and standardizing the commodity code to enable development of the single application e-form for each restricted product and its information exchange with the NSW system, establishing a Single e-Form platform, and expediting improvement of laws and regulations to enable paperless transactions and information exchange through the NSW system

3.3 Improve cross-border freight transport facilitation at major trade gateways by promoting collaboration between agencies involving in the Single-Stop Inspection (SSI), encouraging international customs cooperation for the Common Control Area (CCA) between Thai Customs and streamlining cross-border transport and transshipment laws

3.4 Accelerate cooperation and remove barriers to international transport by expediting proactive negotiations at both bilateral and multilateral levels, accelerating the implementation of trade and logistics agreements, especially with key trading partners and preparing a risk management plan for the times of crisis

3.5 Enact laws and regulations regarding international transport and logistics by amending outdated or inconsistent Thai laws to be in line with international agreements and improving relevant laws to support modern logistics activities including cross-border e-commerce

4 Capability Enhancement of Thai Logistics Service Providers

4.1 Enhance Thai LSPs' capability by supporting the use of technology, innovation and digital platforms such as smart GPS and digital sensors, promoting improvement of logistics services for special goods, such as pharmaceuticals, promoting business operations using sharing economy frameworks to improve resource efficiency and to reduce business operating expenses, supporting operators in access to databases for further improvement of their service potential and supporting green businesses

4.2 Elevate Thai LSPs to international markets by enhancing Thai LSPs' potential to provide a one-stop service and acquire international standard certificates, encouraging Thai LSPs to develop or apply an up-to-date business model by considering cross-border logistics network incorporation, risk management, smart warehouse management, multimodal transport, last-mile delivery, and/or cold chain management, etc., fostering industrial investment and local logistics businesses to build a logistics community and encouraging providers, particularly SMEs and startups, to build their cooperation network

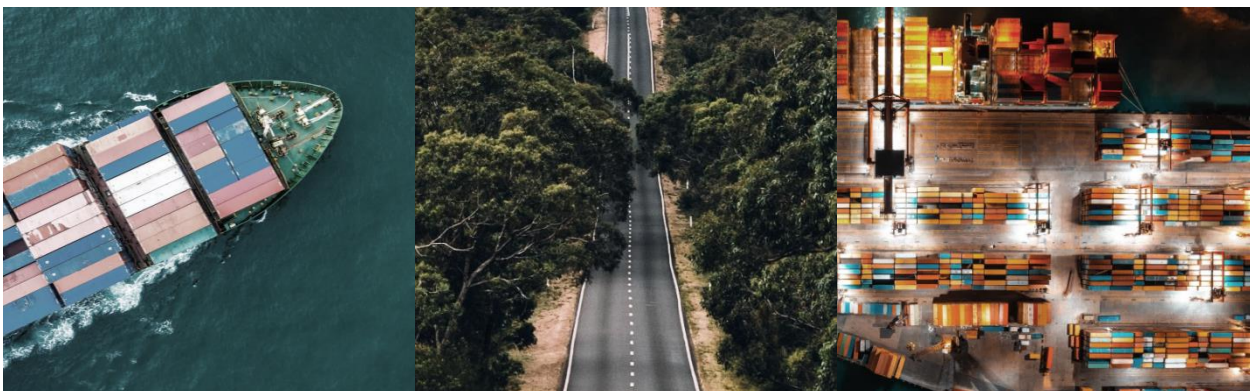
5 Research and Development Enhancement, Logistics Personnel Capacity Building, and National Logistics Evaluation

5.1 Promote technological and innovative R&D projects in logistics for domestics use by creating funding mechanisms for research projects that can be applied for commercial purpose, building national and international collaboration networks in research through information and knowledge exchange, and driving the use of technology and innovations derived from the research to further improve logistics activities

5.2 Provide investment support for the industry using technology and innovation in logistics activities by designing policies, incentive measures, and benefits to attract investors and promoting public procurement that supports entrepreneurs and industries adopting domestic technology and innovations

5.3 Build capacities of logistics personnel by improving curriculums or training courses that emphasize the use of technology suitable for the logistics industry, and acquire essential skills for international labour markets consistent with business needs

5.4 Monitor and evaluate logistics performance by developing up-to-date logistics information or success indicators in line with context changes, building a logistics-related database system to be linked and shared across agencies, and monitoring and evaluating responsible agencies' performance in accordance with success targets of the logistics development strategies



Appendix 1: Thailand's Logistics Cost and Logistics Cost to GDP from 2012-2021e

by Logistics Information Development Working Group

Unit: Billion Baht

Logistics Cost	2012	2013	2014	2015	2016	2017	2018r	2019r	2020p	2021e
Transport Cost	**932.2**	**953.4**	**994.9**	**1,016.3**	**1,078.3**	**1,049.5**	**1,104.6**	**1,094.2**	**1,021.7**	**1,044.2**
Pipeline	39.4	35.6	49.6	43.6	51.9	62.4	68.2	61.1	53.2	53.2
Rail	2.1	2.1	1.8	1.8	2.1	2.1	2.1	2.0	1.9	1.8
Road	554.5	562.3	577.1	590.9	631.0	559.0	567.6	564.5	517.8	519.0
Water	201.8	203.6	205.0	220.4	224.3	233.2	243.0	238.6	226.7	234.4
Air	41.4	41.1	39.5	36.4	39.7	42.4	46.1	42.5	14.0	14.6
Transport-Related Services	76.1	87.1	97.9	99.8	103.9	113.7	126.0	127.3	138.1	149.3
Parcel Services	16.9	21.6	24.0	23.4	25.4	36.7	51.8	58.2	70.0	71.9
Inventory Holding Cost	**682.9**	**713.9**	**711.2**	**724.1**	**743.1**	**880.4**	**924.1**	**966.8**	**1,013.9**	**1,028.0**
Inventory Carrying Cost	668.1	696.2	696.8	709.2	730.1	689.0	732.3	773.4	815.7	824.9
Warehousing Cost	14.8	17.7	14.4	14.9	13.0	191.4	191.8	193.4	198.2	203.1
Logistics Administration Cost	**161.5**	**166.7**	**170.6**	**174.0**	**182.1**	**155.2**	**163.1**	**165.7**	**163.7**	**166.6**
Total Logistics Cost	**1,776.6**	**1,834.0**	**1,876.7**	**1,914.4**	**2,003.5**	**2,085.1**	**2,191.8**	**2,226.7**	**2,199.3**	**2,238.8**
Gross Domestic Product (GDP)	**12,357.3**	**12,915.2**	**13,230.3**	**13,743.5**	**14,554.6**	**15,488.7**	**16,373.3**	**16,892.4**	**15,636.9**	**16,180.6**

Unit: Percent to GDP

Proportion of Logistics Cost to GDP	2012	2013	2014	2015	2016	2017	2018r	2019r	2020p	2021e
Transport Cost to GDP	**7.6**	**7.4**	**7.5**	**7.4**	**7.4**	**6.8**	**6.8**	**6.5**	**6.5**	**6.4**
Inventory Holding Cost to GDP	**5.5**	**5.5**	**5.4**	**5.2**	**5.1**	**5.7**	**5.6**	**5.7**	**6.5**	**6.4**
Logistics Administration Cost to GDP	**1.3**	**1.3**	**1.3**	**1.3**	**1.3**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**
Logistics Cost to GDP	**14.4**	**14.2**	**14.2**	**13.9**	**13.8**	**13.5**	**13.4**	**13.2**	**14.0**	**13.8**

Source: NESDC

Remark : r refers to revised data

p refers to preliminary data

e refers to estimated data.

Besides, 2017-2021 logistics costs are based on the revised cost assumptions from The Improvement of Thailand's Logistics Cost Calculation Model in fiscal year 2018.

Appendix 2: Transport Cost to GDP by Components from 2012-2021e

by Logistics Information Development Working Group

Unit: Percent to GDP

Logistics Cost	2012	2013	2014	2015	2016	2017	2018r	2019r	2020p	2021e
Transport Cost	**7.6**	**7.5**	**7.5**	**7.4**	**7.4**	**6.7**	**6.8**	**6.5**	**6.5**	**6.4**
Pipeline	0.3	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.3
Rail	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road	4.6	4.4	4.4	4.3	4.3	3.6	3.5	3.3	3.3	3.2
Water	1.6	1.6	1.5	1.6	1.5	1.5	1.5	1.4	1.4	1.5
Air	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.1	0.1
Transport-related Services	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.9	0.9
Parcel Services	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.5	0.4

Source: NESDC

Remark : r refers to revised data

p refers to preliminary data

e refers to estimated data.

Besides, 2017-2021 logistics costs are based on the revised cost assumptions from The Improvement of Thailand's Logistics Cost Calculation Model in fiscal year 2018.

Appendix 3: Trends of Logistics Costs Growth and GDP between 2012-2021e

by Logistics Information Development Working Group

Unit: Percent

Logistics Cost	2012	2013	2014	2015	2016	2017	2018r	2019r	2020p	2021e
Transport Cost	**9.6**	**2.3**	**4.4**	**2.1**	**6.1**	**-2.7**	**5.3**	**-0.9**	**-6.6**	**2.2**
Pipeline	7.9	-9.6	39.3	-12.2	19.1	20.4	9.1	-10.4	-12.9	0.0
Rail	10.5	0.0	-14.3	3.0	13.3	0.7	-3.0	-4.1	-6.5	-1.5
Road	8.4	1.4	2.6	2.4	6.8	-11.4	1.5	-0.5	-8.3	0.2
Water	20.3	0.9	0.7	7.5	1.8	3.9	4.2	-1.8	-5.0	3.4
Air	-2.1	-0.7	-3.9	-7.9	9.1	6.8	8.7	-7.7	-67.1	4.2
Transport-related Services	7.8	14.5	12.4	1.9	4.1	9.4	10.8	1.1	8.5	8.1
Parcel Services	-13.8	27.8	11.1	-2.5	8.5	44.1	41.2	12.4	20.3	2.7
Inventory Holding Cost	**3.0**	**4.5**	**-0.4**	**1.8**	**2.6**	**18.5**	**5.0**	**4.6**	**4.9**	**1.4**
Inventory Carrying Cost	2.7	4.2	0.1	1.8	2.9	-5.6	6.3	5.6	5.5	1.1
Warehousing Costs	22.3	19.6	-18.6	3.5	-12.8	1,371.2	0.2	0.8	2.5	2.5
Logistics Administration Cost	**6.7**	**3.2**	**2.3**	**2.0**	**4.6**	**-14.8**	**5.1**	**1.6**	**-1.2**	**1.8**
Total Logistics Cost	**6.7**	**3.2**	**2.3**	**2.0**	**4.7**	**4.1**	**5.1**	**1.6**	**-1.2**	**1.8**
Gross Domestic Product (GDP)	**9.3**	**4.5**	**2.4**	**3.9**	**5.9**	**6.4**	**5.7**	**3.2**	**-7.4**	**3.5**

Source: NESDC

Remark : r refers to revised data

p refers to preliminary data

e refers to estimated data.

Besides, 2017-2021 logistics costs are based on the revised cost assumptions from The Improvement of Thailand's Logistics Cost Calculation Model in fiscal year 2018.

Appendix 4: Thailand's Economics Value Added from Logistics activities from 2012-2021e

by Logistics Information Development Working Group

Unit: Billion Baht

Economic Value Added	2012	2013	2014	2015	2016	2017	2018r	2019r	2020p	2021e
Pipeline	29.0	25.5	36.1	31.4	52.5	48.3	52.1	46.8	40.5	37.5
Rail	0.3	0.2	0.6	0.4	0.8	0.8	1.2	1.0	0.7	0.6
Road	117.9	118.0	119.0	135.9	139.4	146.6	149.0	152.9	142.6	146.1
Water	93.4	97.5	98.9	105.5	107.8	111.3	115.7	115.4	109.2	117.5
Air	28.5	29.1	28.7	30.2	35.9	39.9	43.0	39.7	15.1	18.7
Transport-related Services	45.8	49.6	55.6	56.6	59.2	64.8	74.9	84.5	86.7	91.2
Parcel Services	12.9	13.6	14.8	15.7	19.7	24.9	30.5	37.5	47.7	59.8
Warehousing	9.0	10.8	8.8	9.1	8.4	8.5	8.5	8.6	8.8	9.0
Total Economics Value Added	**336.8**	**344.3**	**362.5**	**384.8**	**423.7**	**445.1**	**474.9**	**486.4**	**451.3**	**480.4**
Gross Domestic Product (GDP)	**12,357.3**	**12,915.2**	**13,230.3**	**13,743.5**	**14,554.6**	**15,488.7**	**16,373.3**	**16,892.4**	**15,636.9**	**16,180.6**

Source: NESDC

Remark : r refers to revised data

p refers to preliminary data

e refers to estimated data.

Appendix 5: Trends of Economics Value Added from Logistics Activities between 2012-2021e
by Logistics Information Development Working Group

Unit: Percent

Economic Value Added	2012	2013	2014	2015	2016	2017	2018r	2019r	2020p	2021e
Pipeline	-10.5	-12.3	42.0	-13.0	67.2	-8.1	7.9	-10.2	-13.5	-7.6
Rail	-39.0	-29.3	131.5	-30.5	97.2	9.7	51.1	-21.6	-25.7	-14.6
Road	10.9	0.1	0.8	14.2	2.6	0.7	1.6	2.6	-6.7	2.5
Water	12.4	4.4	1.4	6.7	2.2	3.2	4.0	-0.3	-5.4	7.6
Air	8.9	2.2	-1.2	4.9	18.9	11.3	7.7	-7.6	-61.9	23.6
Transport-related Services	13.2	8.4	12.2	1.8	4.6	9.4	15.6	12.8	2.6	5.2
Parcel Services	5.3	5.4	8.5	6.2	25.2	26.7	22.3	23.1	27.1	25.4
Warehousing	20.9	19.8	-18.9	3.6	-7.6	1.0	0.3	0.4	2.5	2.9
Total Economics Value Added	**9.1**	**2.2**	**5.3**	**6.1**	**10.1**	**3.5**	**6.7**	**2.4**	**-7.2**	**6.4**
Gross Domestic Product (GDP)	**9.3**	**4.5**	**2.4**	**3.9**	**5.9**	**6.4**	**5.7**	**3.2**	**-7.4**	**3.5**

Source: NESDC

Remark : r refers to revised data
p refers to preliminary data
e refers to estimated data.

Working Group

National Accounts Division
State–Owned Enterprises Investment Division
Logistics Development Strategy Division

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