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INDUSTRY HORIZON

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Krungsri Research

Taking steps towards new investment cycle

- Bright outlook for new investment cycle is driven by three visible trends: (i) the Private Investment Index showed the strongest rise in almost three years; (ii) industrial capacity utilization has finally returned to pre-pandemic levels; and (iii) there are more industries expressing confidence.
- Information & Communication is operating at slightly above capacity, while Manufacturing and Agriculture are running at nearly full capacity. Accommodation & Food services and Transport & Storage have recovered by 50% from their steepest slack. Within the manufacturing sector, 29.1% of Thai industries are operating at or above-average production rates. They include *Chemicals & Chemical products, Commercial Vehicles, IC & Semiconductors, Electrical Appliances, HDD, and Automotive Engine.*
- A K-shaped recovery is a post-recession scenario in which one segment of the economy or industry begins to climb back up while another segment continues to suffer. To survive the post-pandemic world, a country or business needs to transform into one that is based on the provision of modern technology and/or services bound to global megatrends. Thai businesses are also pursuing this trend and preparing to invest substantially in new S-Curve industries.

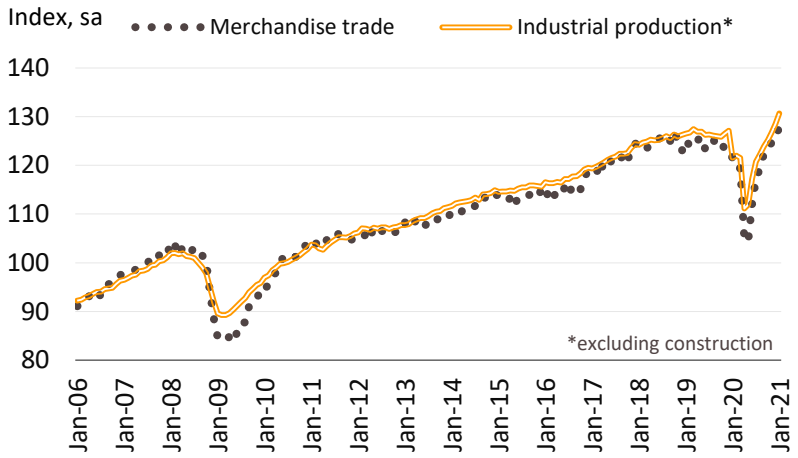


01 INVESTMENT CYCLE

02 SECTOR IN FOCUS

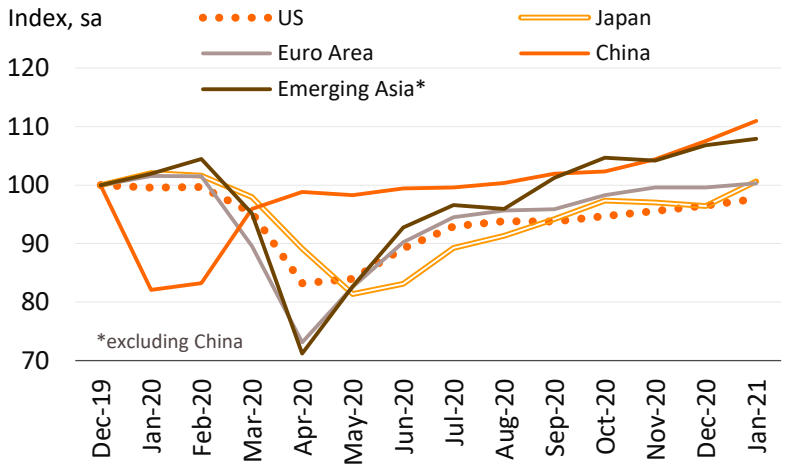
World trade and output at record levels, resilient to resurgence of COVID-19 cases worldwide

World trade and industrial production volume

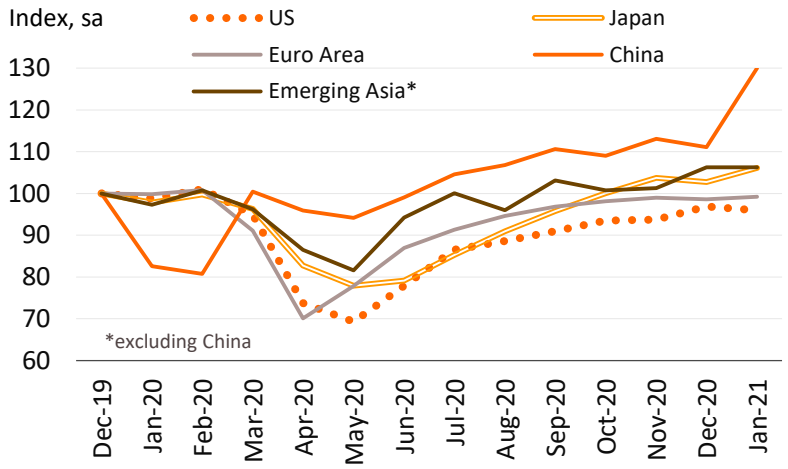


- World merchandise trade and industrial production continued to improve in January to new highs. **Following the onset of the 2008 financial crisis, it took 29 months for world trade and production to hit new higher. It has taken only 13 months in the current crisis.**
- The impressive performance can be largely explained by growth of imports and exports in China and emerging Asia. Trade showed little growth in the United States and Euro area. Meanwhile, economies across the globe are ramping up production in response to pandemic-driven disruption in supply and recovering demand.

Industrial production volume



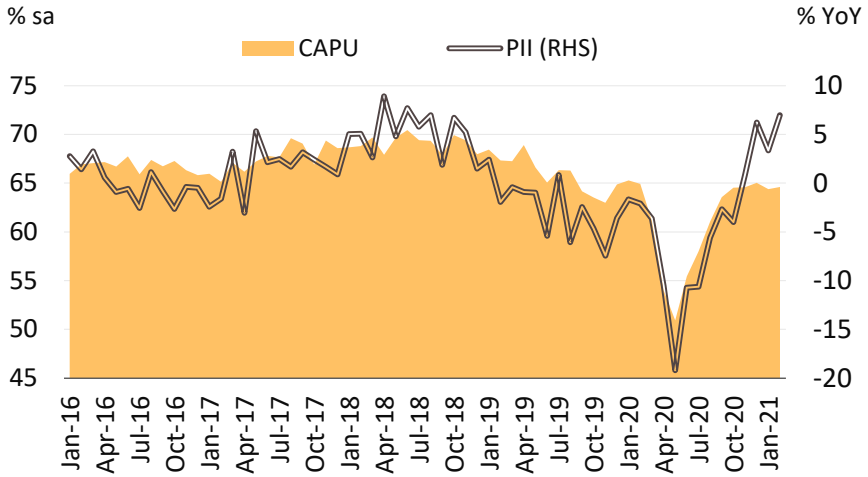
Merchandise export volume



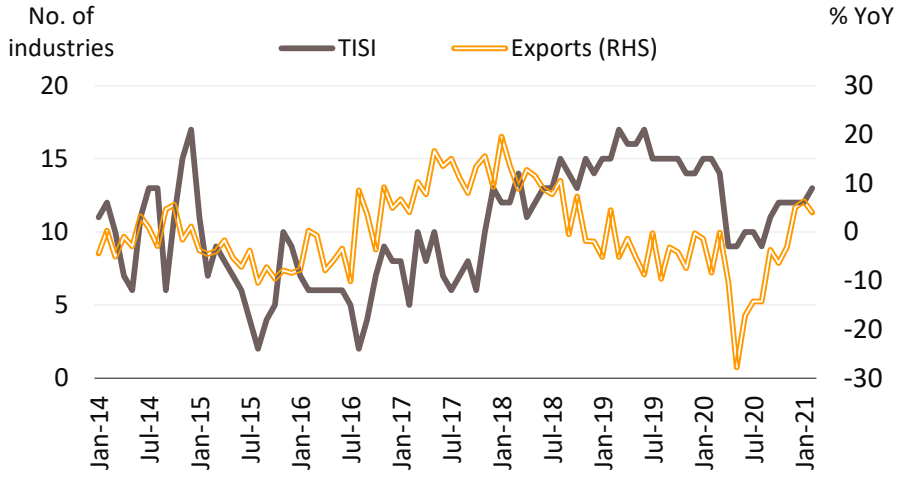
Source: Netherlands Bureau for Economic Policy Analysis, Krungsri Research

Thailand: New investment cycle in sight

Capacity Utilization (CAPU) & Private Investment Index (PII)



Industries with TISI* above-100 & Exports (excl. gold)

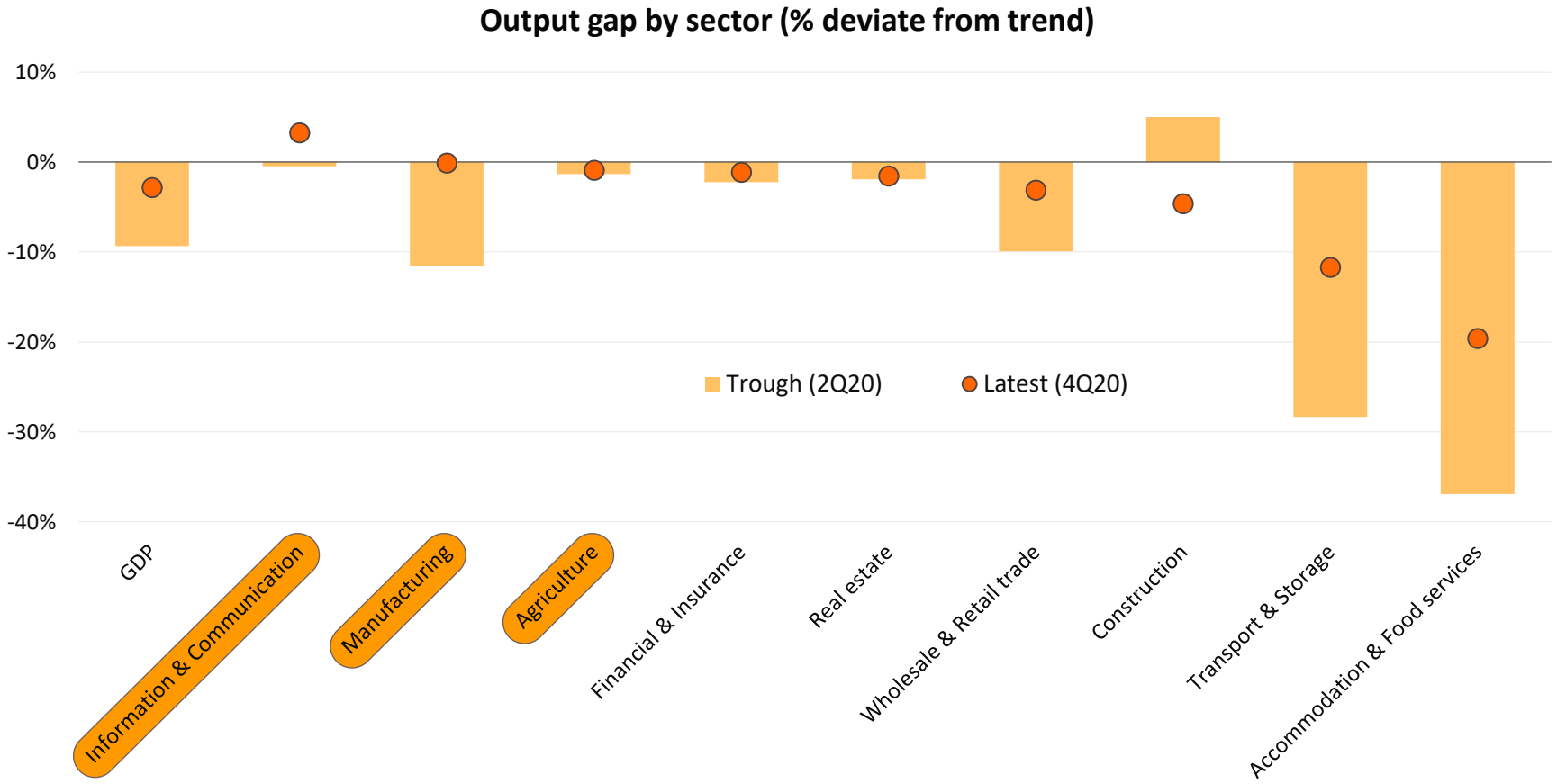


* Thailand Industrial Sentiment Index (TISI): Above (Below) 100 = Improve (Worsen)

- **Bright outlook for new investment cycle driven by three visible trends.**
  - (i) The Private Investment Index surged 7.0% YoY in February 2021, the strongest rise in almost three years.
  - (ii) Industrial capacity utilization has finally returned to pre-pandemic levels, at 66.6% in February (vs 66.8% in December 2020). Manufacturers, notably in export-oriented sectors, continued to ramp up production.
  - (iii) Following a more pronounced rebound in the export sector, there are more industries expressing confidence. The Thailand Industrial Sentiment Index (TISI) for 13 out of 42 industries topped 100 (threshold that separate improving and deteriorating conditions), the most in almost a year. Those industries are Automotive, Auto Parts, Air Conditioning & Refrigeration, Food Processing, Pharmaceutical, Electrical Appliances, Aluminium, Rubber, Plastic, Cosmetic, Printing & Paper Packaging, Chemical, and Software.

Source: Office of Industrial Economics (OIE), Federation of Thai Industries (FTI), Krungsri Research

ICT is operating above-capacity, while Manufacturing and Agriculture are close to full capacity

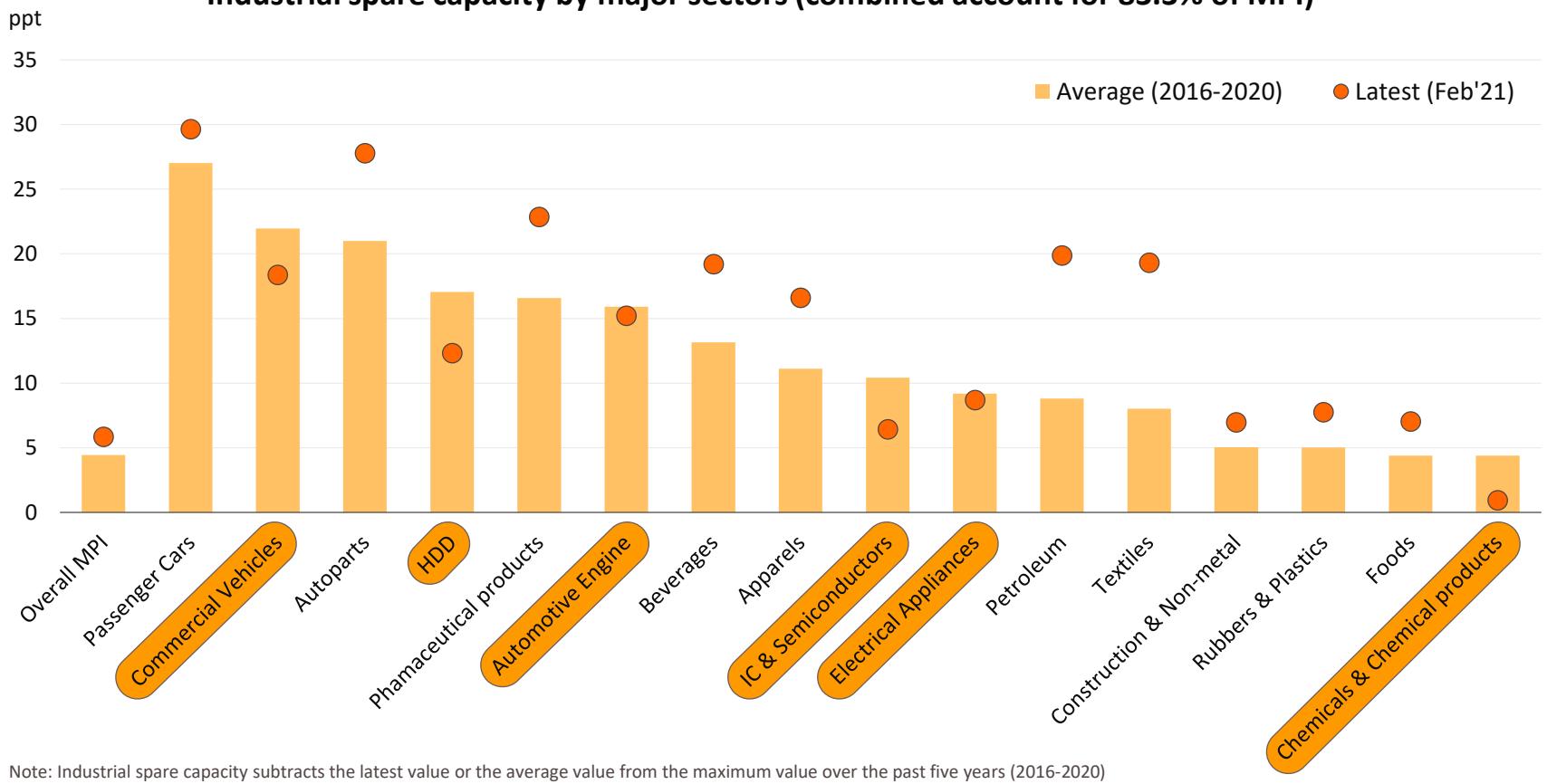


- We investigated how much excess capacity remained in the different sectors in Thailand. We determined the output gap, which refers to idle capacity or slack. **Our findings suggest ICT (Information & Communication Technology) is operating at slightly above capacity, while Manufacturing and Agriculture are running at nearly full capacity. At the other end of the spectrum, Accommodation & Food services and Transport & Storage are unsurprisingly experiencing considerable slack, although conditions have recovered by 50% from their steepest slack.**

Source: Office of the National Economics and Social Development Council (NESDC), Krungsri Research

Within Manufacturing, spare capacity varies across the industry; one-third is operating above-trend

Industrial spare capacity by major sectors (combined account for 83.3% of MPI)

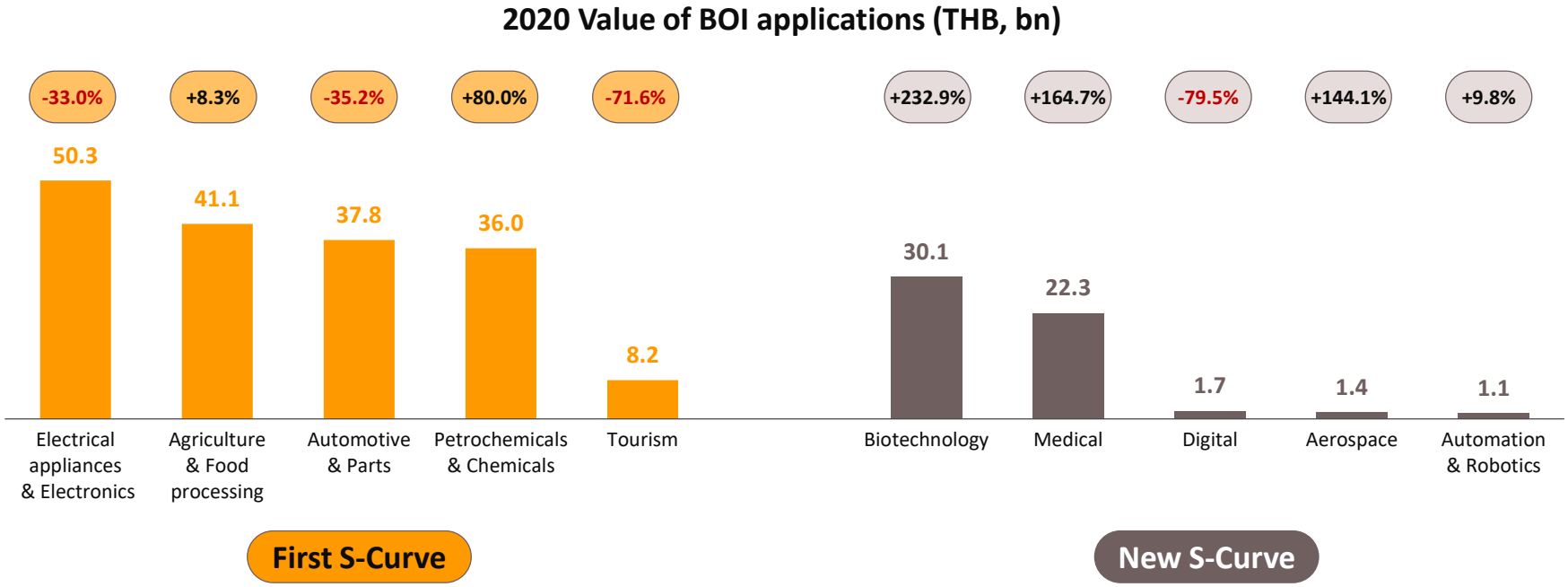


Note: Industrial spare capacity subtracts the latest value or the average value from the maximum value over the past five years (2016-2020)

- Spare capacity reflects the shortfall between current capacity utilization rates and record highs versus the average of this metric over the past five years (2016-2020). **Relative to historical levels, the data indicate 29.1% of Thai industries are operating at or above-average production rates. They include Chemicals & Chemical products (accounts for 8.0% of MPI), Commercial Vehicles (7.2%), IC & Semiconductors (5.5%), Electrical Appliances (3.8%), HDD (3.4%), and Automotive Engine (1.3%).**

Source: OIE, Krungsri Research

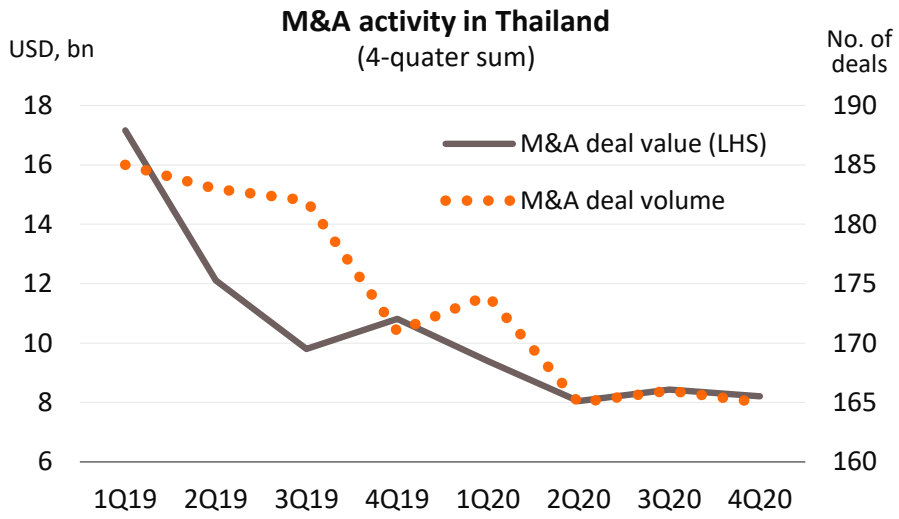
New investment cycle for S-Curve industries will help Thailand navigate through the post-pandemic world



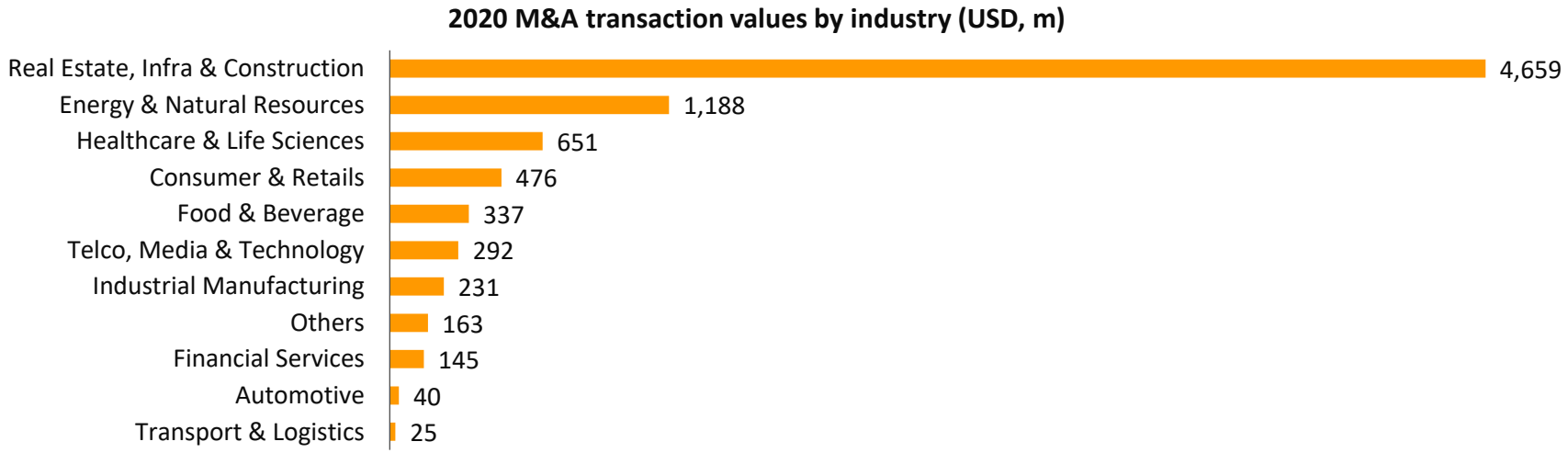
- A K-shaped recovery is a post-recession scenario in which one segment of the economy or industry begins to climb back up while another segment continues to suffer. **To survive the post-pandemic world, a country or business needs to transform into one that is based on the provision of modern technology and/or services bound to global megatrends (e.g. aging population, health & wellness, sustainability, etc.). Thai businesses are also pursuing this trend and preparing to invest substantially in new S-Curve industries.** In 2020, the value of BOI applications skyrocketed for projects in these industries, including: (i) Biotechnology (THB30.1bn, up 233% from a year earlier); (ii) Medical (THB22.3bn, +165%); (iii) Aerospace (THB1.4bn, +144%); and (iv) Automation & Robotics (THB1.1bn, +9.8%). Beyond this, despite lingering uncertainties, BOI applications for projects in first S-Curve industries rose impressively, notably Petrochemicals & Chemicals (THB36bn, +80%), and Agriculture & Food processing (THB41.1bn, +8.3%). However, applications for tourism-oriented projects tumbled by 72% to THB8bn.

Source: Board of Investment (BOI), Krungsri Research

M&A activity slow down in Thailand, but is booming in real estate, construction, energy, healthcare sectors



- Overall, M&A activity eased in 2020. The number of transactions edged down to 165 (from 171 in 2019) and total value of deals dropped to USD8.2bn (from USD10.8bn in 2019). The five largest industries by M&A transaction value are (i) real estate, infra & construction; (ii) energy & natural resources; (iii) healthcare & life sciences; (iv) consumer & retails; and (v) food & beverage. These sectors combined accounted for almost 90% of total deal value. **Considering the border restrictions, we read this M&A turnout as a pleasant surprise. Coupled with the ongoing mass vaccination programs, we are optimistic of the M&A landscape in Thailand, and in turn, business investment.**



Source: KPMG, S&P Capital IQ, Krungsri Research



01 INVESTMENT CYCLE

02 SECTOR IN FOCUS

EEC: Current state of play

EEC, Digital Park Thailand (EECd)

Expected by 2021
By National Telecom Public Company Limited (ToT)

Aircraft Maintenance Repair and Overhaul – MRO (U-Tapao)

Expected by 2023
By Thai Airways International Public Company Limited

Map Ta Phut Industrial Port Development Phase 3 Project

Expected by 2024
By Industrial Estate Authority of Thailand (IEAT)



U-Tapao Rayong-Pattaya International Airport

Expected by 2024
By the Royal Thai Navy

High-Speed Rail Linked 3 Airport Project

Expected by 2025
By the State Railway of Thailand

The Development Project of Laem Chabang Port Phase 3

Expected by 2025
By Port Authority of Thailand

- **Although the Thai economy was severely hit by the COVID-19 pandemic and subsequent lockdowns, the government remains firm in its commitment to develop the EEC.** So, under 2021 budget, they allocated THB22.71bn for the EEC integrated development plan, THB6.68bn (or 42%) more than the 2020 budget allocation of THB16.03bn. The 3 biggest winners of this hike are the State Railway of Thailand (additional THB2.79bn), the Navy (additional THB2.16bn) and the National Science & Technology Development Agency (additional THB1.38bn).
- **With regard to foreign direct investment, the government believes that post-COVID-19, Thailand will remain the ASEAN zone's most important hub for supporting industries and the EEC will attract greater FDI into the country.** This is because the EEC has advanced infrastructure, high-quality logistics, a skilled workforce in the area, a favorable business environment with investment incentives for investors, ready access to raw material and inputs, wide range of parts suppliers, and a large number of industrial estates. And, unlike many other countries, Thailand's manufacturing industry continued to operate throughout the pandemic.

Source: Eastern Economic Corridor (EEC) Office, Local press, Krungsri Research

2021 development strategy for EEC will be multi-pronged

Digital infrastructure

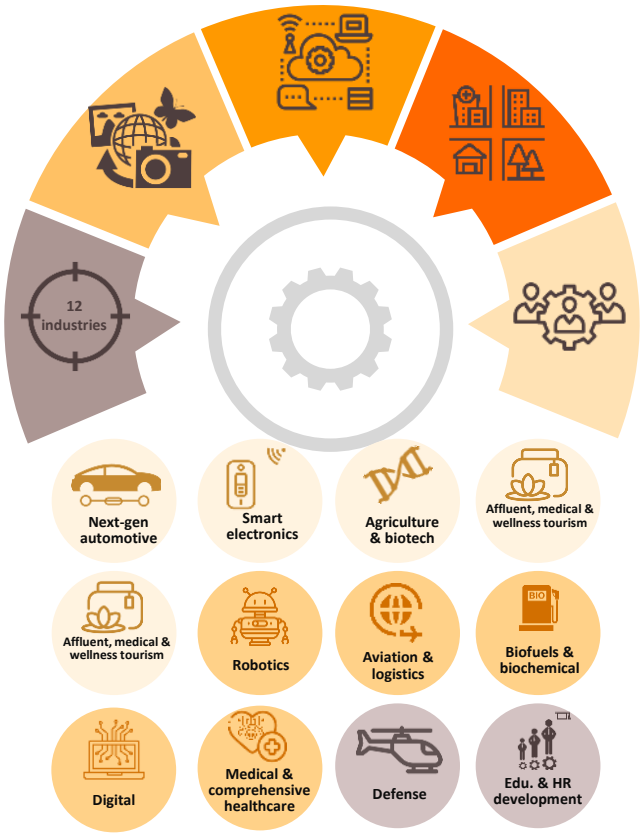
Develop the digital infrastructure, including the IoT Institute to develop future digital industries and turn the EEC into a national integrated digital innovation design hub.

Tourism

Promote and develop tourism

12 targeted industries

Promote investments in the government's 12 targeted industries.



Infrastructure & public utilities

There is progress in developing the business area and linking this to the ferry port and dock at Sattahip, as well as several mega projects in the area.

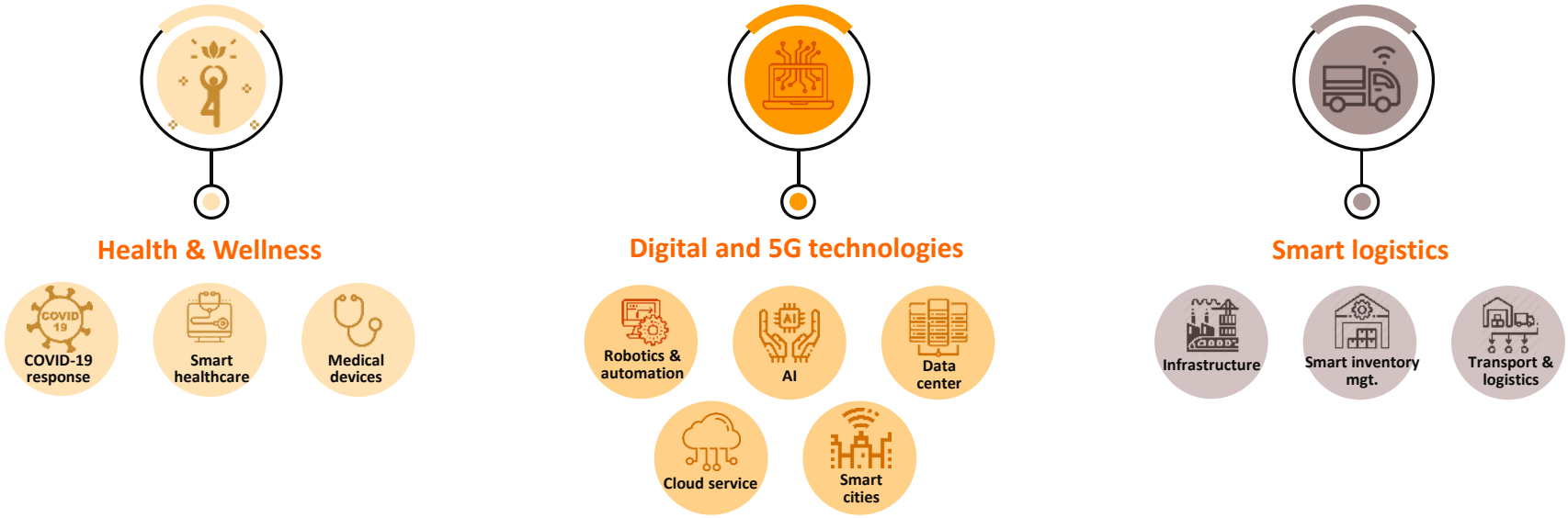
Workforce

To create (educate) and train a skilled workforce, upgrade research & development activity, and stimulate innovation. Encourage cooperation and joint-investments between Thai and overseas universities to upskill the labor-force, especially in digital technology, logistics, smart electronics, and aeronautics.

- The strategic impact of the EEC and related megaprojects includes the development of land-, sea- and air-transport infrastructure that connects to neighboring countries, construction of a 'land bridge' that links Laem Chabang with Chumphon and Ranong ports, and the Suvarnabhumi-Don Muang-U-Tapao highspeed rail-link, which will connect to the high-speed line between Bangkok and Nakhon Ratchasima, as well as to high-speed lines in neighboring countries. This is in line with the Belt & Road Initiative and plans to improve access to raw material and inputs, benefits accruing from the development of special economic zones and the potential of the Thai workforce. These developments also exploit both the post-COVID-19 evolution of global supply chains and the recently-signed RCEP agreement. Combined, these will help to attract greater foreign investment inflows and encourage manufacturers to relocate production facilities to Thailand and to the broader region.

Source: EEC Office, Local press, Krungsri Research

EEC Policy Committee has identified three central high-potential industries



- The EEC Policy Committee has identified 3 central high-potential industries within the 12 targeted industries, and are focusing their efforts to develop investment promotion guidelines to attract investment into these.
  - **Health & wellness:** This includes the targeted comprehensive healthcare and medical tourism industries. It will emphasize the use of very precise medical and genomics technology.
  - **Digital and 5G technology:** This encompasses targeted industries that include digital operations, electronics, robotics and automation, and next-generation autos. This group focuses on the use of 5G systems to develop platforms and involves investing in the development of the Eastern Economic Corridor of Innovation (EECi) and the Digital Park Thailand (EECd).
  - **Smart logistics:** This includes aviation and logistics, and affluent and wellness tourism. This segment emphasizes the use of hi-tech management systems in electronic commerce and connections with U-Tapao Airport.

Source: EEC Office, Local press, Krungsri Research

EEC is developing five promoted zones with large investments in the EECd and EECi

- **Digital Park Thailand (EECd)** is established in Chonburi to encourage future digital innovation and help current ICT industries transition to 'new S-curve' digital industries. As part of this, the private sector has invested THB4.34bn to create the IoT Institute, which objective is to build confidence in and attract investors to the EECd. The Institute will also grow into the 'Thailand Digital Valley', and this will help push Thailand to transform into a digital hub. The Institute is constructing 5 centers: the Intelligent Operations Center, Digital Knowledge Exchange Center, Digital Co-Creation and Innovation Center, Digital Edutainment Complex and Digital Go Global Center.

- **The Eastern Economic Corridor of Innovation (EECi)** is located in Rayong and Chonburi. Within this, the National Science and Technology Development Agency has rented space to develop as a model that uses innovation to drive the creation of new high-tech industries. There has been progress in this, as follows:



Biopolis

- The Biopolis bio-innovation platform has been allocated THB3.27bn for the construction of a biorefinery to support the development of local bio-industries. They are currently signing contracts to lease land and purchase equipment. They are also negotiating with the Belgium Bio Base Europe Pilot Plant to form a joint-venture in the Bio Base Asia Pilot Plant company to manage the EECi biorefinery.

Aripolis

- The Aripolis platform for innovation in automation, robotics and smart systems is led by the National Science and Technology Development Agency (NSTDA), which is also preparing the Sustainable Manufacturing Center (SMC) for cabinet approval and developing the Industrial IoT and Data Analytics Platform (IDA). The latter is set up to improve the use of industrial machinery by reducing energy consumption, increasing efficiency, and scheduling maintenance. This was piloted in 10 factories in 2020 and a pilot project has been set up to test the use of the Smart Industry Readiness Index (SIRI).

Innopolis

- Space Innopolis is a platform to develop innovation in aeronautics. It is now operating a 5G sandbox for the pilot and testing of driverless trams that utilize high-precision GNSS. This project is managed by the Geo-Informatics and Space Technology Development Agency (GISTDA), which is working together with private-sector partners.

Technology transfer

- Technology transfer to communities and industry in these areas will raise the capabilities and technological uptake of SMEs and startups.
  - The cabinet has approved the 3-GeV synchrotron for operation from 2021-2027. The project is managed by the Synchrotron Light Research Institute in partnership with other domestic and overseas organizations.
  - Expert advice and technological assistance related to smart agriculture is also given to communities and farmers in the EEC, and they are opening agricultural demonstration sites. In addition, PTT has constructed an Infrastructure & Utilities Center in the Innovation Zone, comprising (i) an international school, (ii) an area for hotels and apartments, and (iii) a mixed-use zone that will be used for different shops with a retail area.

Source: EEC Office, Local press, Krungsri Research

Logistics centers will benefit from greater economic activity in special economic zones and border regions

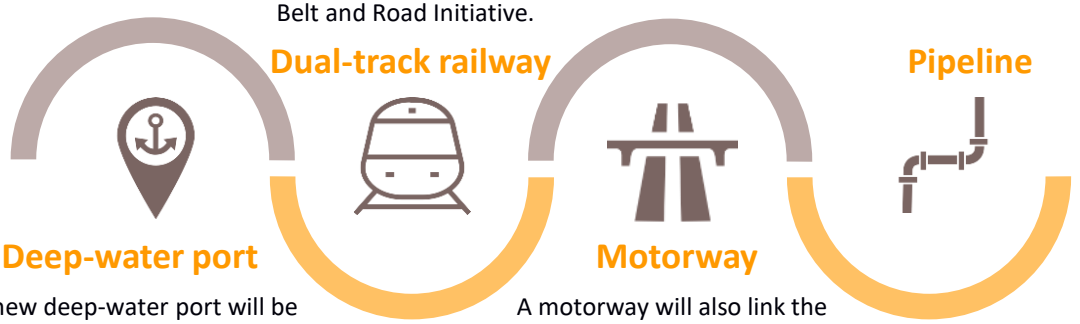


- The Chiang Khong Freight Logistics Distribution Center in Amphoe Chiang Khong, Chiang Rai Province is a new infrastructure project that will facilitate the distribution of international road freight traveling along the R3A. This will connect the logistics networks of Thailand, Lao PDR and China via the Fourth Thai-Lao Friendship Bridge (Chiang Khong-Huay Xai).
  - The Center should open in June or July 2021, though private-sector operations will be able to rent space from April. The Center is a 15-year PPP net cost project and the private-sector will take over operations in 2022.
  - Within the Center, there is a container handling facility, warehousing and a common control area. The project will help to cut transportation and logistics costs (incurred as a result of the Chiang Khong border post) and support growth of the local special economic zone.
- Other projects pushed by the Department of Land Transport include the Nakhon Phanom border transportation center. They will break ground in 2022 and the project should be completed by 2025, which would support the opening of the dual-track Ban Phai-Nakhon Phanom rail line.

Source: Local press, Freepik, Krungsri Research

Government is moving forward with the creation of a logistics network linking southern Thailand to the EEC

The project has several components

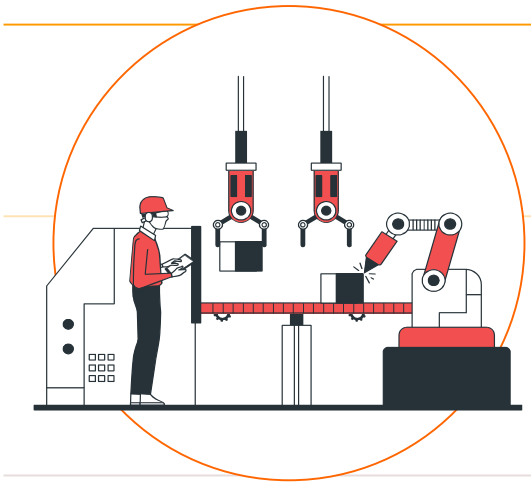


- A project is underway to develop a 'land bridge' between the Gulf of Thailand and the Andaman Sea that will facilitate easier transportation of goods across the Thai-Malay Peninsula.
  - The land bridge will help Thailand become a regional center for the sea transportation network linking Thailand, the ASEAN region, China and India, and onwards to the Middle East and the EU. The land bridge will also shave up to 2 days off trips between the Indian Ocean and the Pacific.
  - The project will require about THB100bn investment. However, this will be structured as a PPP and initial investments is estimated to include a 30-70 split between Thai and overseas private-sector players. Construction should take around 3 years and will help to attract additional foreign investment to Thailand.
  - As a first step, the Office of Transport and Traffic Policy and Planning will contract consultants to advise on the suitability of the project, to plan the project, and carry out environmental impact assessment. This will be completed in 2023.

Source: EEC Office, Local press, Krungsri Research

Connecting markets and distribution networks within EEC

- **The Industrial Estate Authority of Thailand (IEAT), PTT Public Company Limited and the EEC Policy Committee have agreed to cooperate to develop the Eastern Fruit Corridor (EFC)** through a 'demand-driven approach'. That will employ cold storage to keep fruits fresh for longer, to meet market demand as well as add-value to and increase the competitive potential of agricultural produce. The Department of Industry believes it will be able to generate interest from downstream industries, which would lead to more investment to develop industrial estates.



IEAT

- The IEAT is supporting the project through the initial allocation of 40 rai from the Smart Park Industrial Estate in Map Ta Phut, Rayong.

PTT

- PTT is using its expertise in energy and power to assist by (i) providing a 4,000-tonne freezer that uses a liquid natural gas-powered blast freezer to chill fruits rapidly. This helps to keep the fruit at the required temperature and fresh, (ii) making available a temperature-controlled cold storage facility to allow fruits to be distributed throughout the year. The 1st phase of the project will be completed by the end of 2021.

EEC Office

- The Eastern Economic Corridor Office of Thailand will coordinate the promotion of the project's benefits to the public and private sectors, research domestic and international demand, and create premium products as determined by market demand. The pilot project will include durian, mangosteen and other fruits grown in the eastern region and seafood. The goods will be sold via modern distribution channels including e-commerce and e-auction. There will be investments in packaging facilities to allow for the rapid penetration of export markets. And, they will create a membership scheme that include fruit growers and cooperatives.

- **The Port Authority of Thailand (PAT) and Amata Corporation have signed an MOU to conduct feasibility studies on the development of a dry port in Amata Smart & Eco City in Lao PDR.** This will connect to the Thai national transportation and logistics system. It will create a goods distribution network linking Lao PDR (Natoy), China (Kunming) and Thailand (Laem Chabang Port in Chonburi). The feasibility studies should be completed by July 2021 and construction will take 3 years. This suggests operations should start in late-2024 or early 2025.

Source: EEC Office, Local press, Krungsri Research

Warehousing is benefiting from growth in e-commerce and rising demand for storage of goods/stock



WHA (supplier of built-to-suit warehousing in strategic areas in Bangkok, Samut Prakan and the EEC) will open 5 large distribution centers in 2021. These will have a combined footprint of 400,000 sq.m. and will be fully fitted out as 'smart warehouses' equipped with new technology, e.g., 5G and robotics systems.

V. Cargo (provider of third-party logistics services) is renting out a 2,300 sq.m. facility to the Government Pharmaceutical Organization on a 3-year lease. It is currently constructing a cold storage facility in Wang Noi in Ayutthaya to handle medicines and pharmaceuticals.

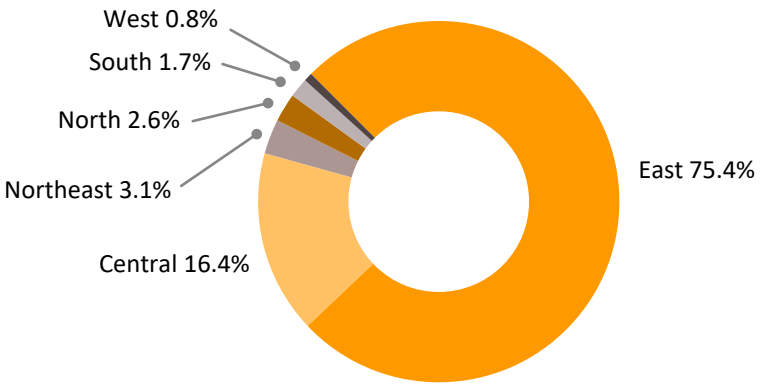
Frasers Property Thailand, a provider of rental ready-built warehousing to mainly logistics operators (43% of their customers), has carried out a survey of global investors' needs for industrial space in Thailand. The survey revealed that more than 50% of Chinese investors would be interested in the country once Thailand reopens its international borders and lift all travel restrictions.

Frasers Property believes that interest from Chinese investors will increase, given rising investment that is driven by several factors. (i) The US-China trade war is encouraging Chinese businesses to relocate out of China, with demand coming mainly from operations in electronics, electric vehicles, logistics, etc. (ii) The COVID-19 pandemic has forced businesses to rethink the importance of factories and warehouses as supply chains have become more efficient (because of strong growth of online sales). Relative to its neighbors, Thailand is skilled in supply chain management, and the government is exploiting this to attract more FDI (foreign direct investment). (iii) The rollout of COVID-19 vaccines is boosting confidence, so manufacturing activity should pick up in 2H21.

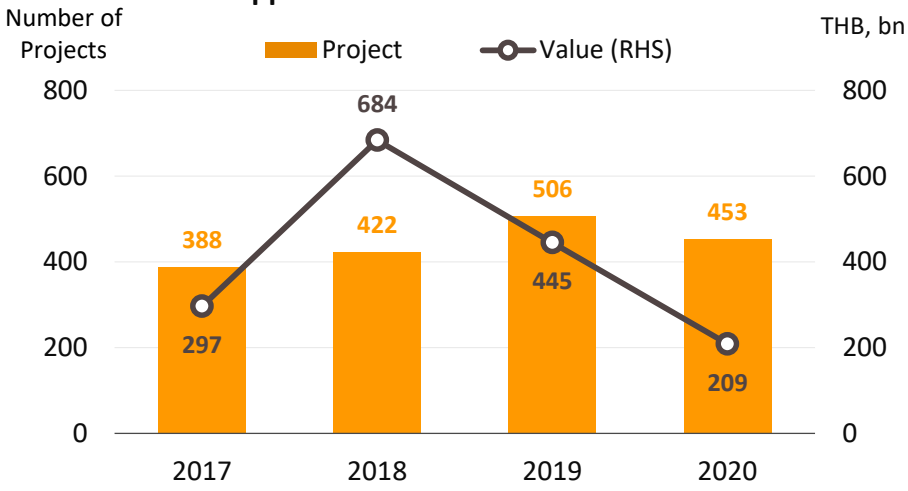
Source: Local press, Slidesgo, Krungsri Research

Industrial Estate: The EEC remains an attractive investment target for industrial estate developers

Industrial Estate Area, by region
(as of 9M20)



Applications Submitted in EEC Area

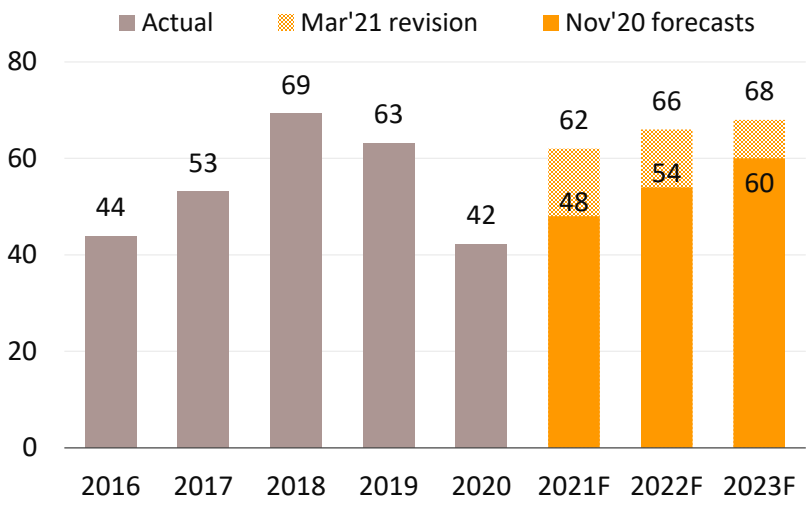


- **The number of investment projects in the EEC had been rising steadily but in 2020, the COVID-19 pandemic pushed this into reverse.** In 2020, a total of 453 applications for investment support for EEC-based projects were submitted to the BOI. They had a total value of THB210bn (26% and 43% of total BOI applications by number and value). At the same time, several new industrial estates were set up in the EEC, while some existing operations were expanded.
  - **3 new industrial estates will be established in the EEC in 2021:** (i) *Rojana Nong Yai Industrial Estate* in Chonburi, with an area of 1,900 rai; (ii) *Egco Industrial Estate* in Rayong, with an area of 621 rai; this is now scheduled to open in 2022; and (iii) *Asia Clean Industrial Estate* in Chonburi, which has an area of 1,294 rai. All these industrial estates hope to attract players from the government's targeted first S-curve and new S-curve industries (e.g., electronics and smart appliances, and future auto parts).
  - **Operators are increasing investment to both expand industrial estates and move into other industries.** *Amata Corporation* is in the process of adding another 1,000 rai to Amata City Industrial Estate in Rayong to meet new demand from companies relocating production facilities to Thailand. *WHA Corporation* plans to develop 5 large product distribution centers with a combined footprint of over 400,000 sq.m. to support growth in e-commerce and will expand 3 existing industrial estates (i) WHA Eastern Seaboard Industrial Estate, (ii) WHA Rayong Industrial, and (iii) WHA Industrial Zone. Some new players to the industrial estate industry, namely Egco Group, are also partnering with companies active in smart energy to make future investments in industrial estates.

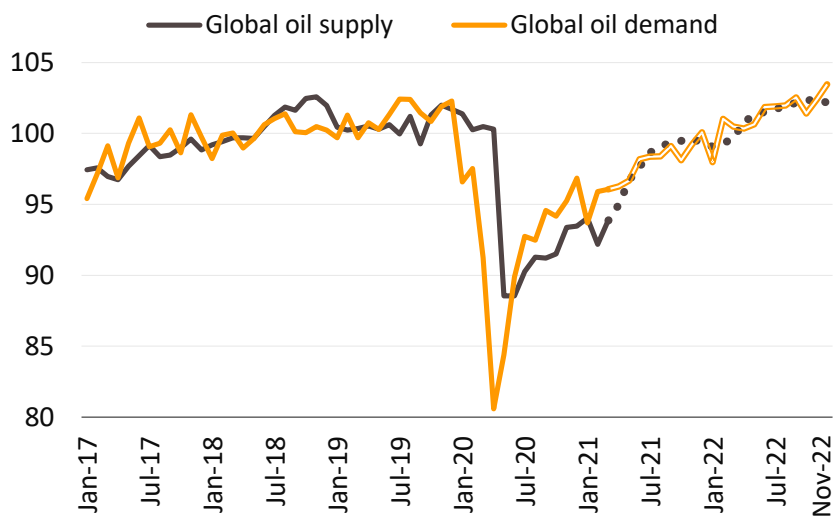
Source: REIC, BOI, Krungsri Research

Oil & Gas: Both tight supply and recovering demand are pushing crude oil prices to pre-pandemic levels

Dubai Crude Oil Price, Average (USD/bbl)



Global Oil Market (million bpd)



- Global crude oil prices reached USD60 level in 1Q21 and are likely to stay above pre-pandemic levels (Dubai crude at $61 in 4Q19) as demand rises amid supply restriction. **We raised oil price forecasts to USD62 for 2021, USD66 for 2022, and USD68 for 2023 from USD48, USD54, and USD60, respectively.**
  - **Recent supply-shock factors affected the global oil market in 4Q20-1Q21**. Extreme cold weather in several countries has raised demand for heating and disrupted Texas' oil production and transportation, and OPEC+ agreed to keep production at current levels, so supply remains tight. However, OPEC+ plans to increase oil production gradually while monitoring the market.
  - **Global economic activities rebound amid COVID-19 mass vaccinations in the first half of 2021.** This will gradually increase oil demand and drive prices up. The travel and tourism sectors will likely recover in the next two years, possibly starting in 2H22, which would also boost oil demand.

Source: U.S. Energy Information Administration (EIA), Bloomberg, Krungsri Research

Rising investment in non-oil businesses, especially in EVs, F&B, and alternative energy

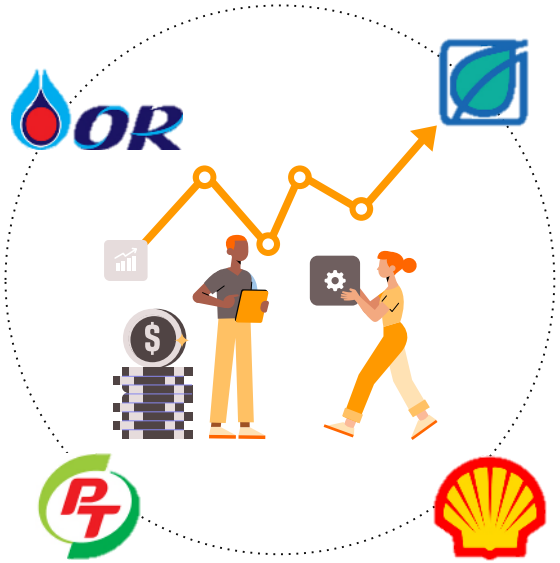
PTTOR

- Investing in installing electric vehicle (EV) charging stations at service stations along major national highways, and in other businesses related to EVs, including selling EV chargers, producing EVs and EV batteries, and repairing EVs at their FIT Auto service stations. The company plans to expand its network from 1,968 outlets to 3,100 by 2025.
- Expanding the Café Amazon network from 3,168 branches to 5,800 by 2025, extending by 10 years its agreement with 7-Eleven to site stores in service stations, acquiring shares in Ohkajhu restaurant chain, and importing the Texas Chicken fast-food brand and expanding branch network by 20 restaurants per year.

PTG Energy

- Investing in building EV chargers and establishing 'Autobacs' auto repair centers.
- Expanding the branch networks for Pun Thai and Coffee World cafés and the Max Mart convenience store, as well as developing marijuana-based food and drink products.
- Producing and distributing B100 fuel (part of the 'palm complex') and developing its household LPG business.

Type of non-oil investment



Bangchak

- Investing in installing EV chargers at its service stations, creating a business for in-house management of electric motorcycles and three-wheelers, and developing an electric motorcycle rental startup.
- Ceasing agreement with Spar convenience stores. It is now partnering with Central to open Family Mart and Tops Daily stores at service station sites.
- Investing in green electricity, high-value bio-products, petrochemicals, plastics and solvents.

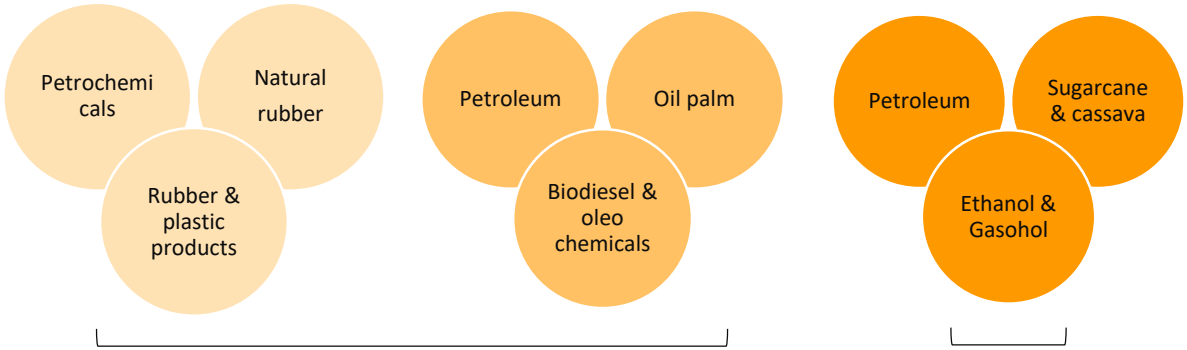
Shell

- Plans to introduce 'Shell chuan chim' restaurants and products at its service stations.
- Expanding Daily Café and Select (convenience store) networks and partnering with Starbucks to open outlets at service stations.

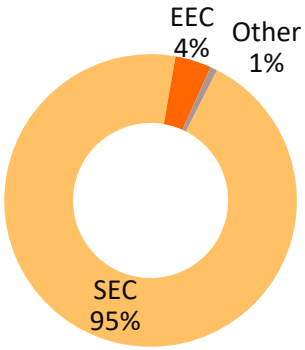
Source: Local press, Krungsri Research

Petrochemicals: Phase IV plan aims to boost investment in special economic zones

Three clusters in investment plan



Share of investment values by area



- Phase IV of the petrochemical industry development plan (2025-2027) should be concluded by the middle of this year. The objective is to use the petrochemicals industry to help Thailand escape the middle-income trap.
  - Expand export markets, and establish production facilities and common markets in the CLMVT nations.
  - Become a tire production hub, which would help Thailand to achieve its goal of becoming a center for auto assembly in Asia.
  - Develop hydrocarbon products in conjunction with agricultural crops, such as rubber, palm, sugarcane and cassava.
  - Develop a hub for biodiesels and oleo chemicals by encouraging the use of these as inputs in the bio-industry.
  - Build value by developing the circular economy.

- Development is split into 3 clusters. The most suitable areas for investment are:
  - Petrochemical products, such as plastic pellets for use in the manufacture of auto parts, electrical appliances and electronics.
  - Chemical additives, such as catalysts and additives used in the electronics industry.
  - Bio-products, such as bio-chemicals, bio-plastics, and bio-fuels.
- The THB2.7trn investment under Phase IV of the petrochemical industry development plan will be targeted at the following areas:
  - The SEC special economic zone will have around 3,700 KTA of biodiesel production capacity, producing 1m liters/day of biodiesel and 7m tires per year.
  - The EEC will have 430 KTA of production capacity.
  - Other areas (for bio-products) will have a production capacity of 250 KTA and 2.25m liters/day for ethanol.

Source: Ministry of Energy, Petroleum Institute Of Thailand (PTIT), Krungsri Research

Power generation: Investment is rising in the EEC in both core and new businesses

- **Electricity generation in the EEC (not part of 2018 PDP) includes the following:**
  - PEA Encom, a public-private joint venture subsidiary of the Provincial Electricity Authority, is targeting to develop at least 500 megawatts of installed solar generating capacity over 2021-2026 that will require about THB23bn total investment. This was agreed by a resolution passed on 6 January 2020 at a meeting of the Eastern Economic Corridor Office of Thailand chaired by the Prime Minister, as laid out in the Eastern Economic Corridor Act of 2018.
  - It has been decided that 1,700 megawatts of gas-fired capacity should be installed as the first step on the road to developing a model future industrial city in Songkhla. This was agreed by a resolution of the Southern Border Provinces Development Strategy Committee and noted by the Cabinet on 26 January 2021.
  - On 28 January 2021, the army and the Electricity Generating Authority of Thailand agreed to set up a solar farm. This will begin with research involving a 300-megawatt pilot project on a 3,000-rai plot operated by the army in Kanchanaburi.

Companies that have expressed an interest

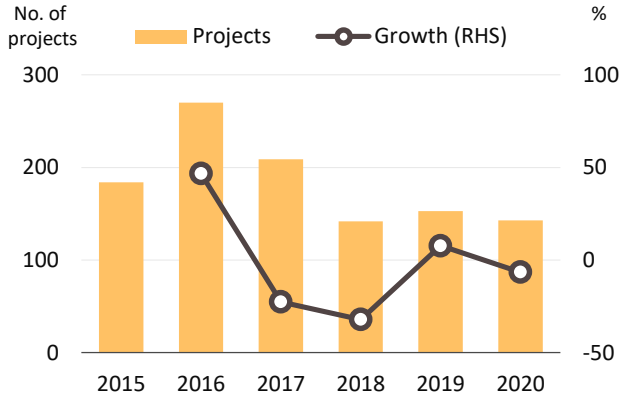
SPCG-PEA ENCOM collaboration	A 500-megawatt solar farm
TPI Polene Power	A 1,700-megawatt power station in the South
Egco Group	Egco is developing a 'smart and green' industrial estate in Rayong open to all types of industries. The industrial estate will supply a range of services and connect businesses to utilities such as water and electricity. The estate will also offer access to cold storage facilities and reduce pollution by providing waste-water treatment and waste management services. The industrial estate will try to create long-term growth by attracting new businesses outside its core area of power generation. Hence, they signed a new development contract with the Industrial Estate Authority of Thailand in January 2021. Currently, they are conducting environmental impact assessment. The estate is expected to be officially open for business in 2022.



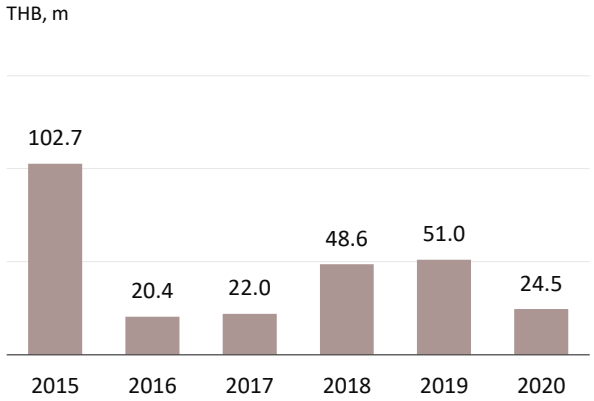
Source: Local press, Freepik, Krungsri Research

Digital industries: Investment slowed in 2020, with money tending to go into enterprise software and digital services

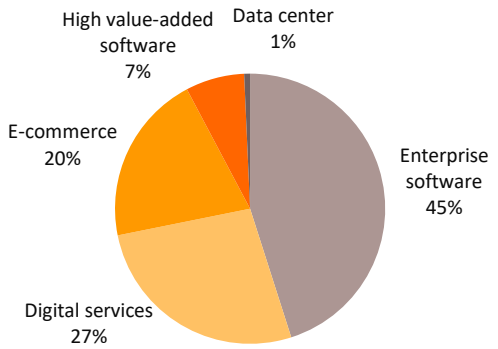
Digital Investment Projects Approved by BOI



Average Project Value of Digital Investment Approved by BOI



Share of Digital Investment Projects by Type (2020)

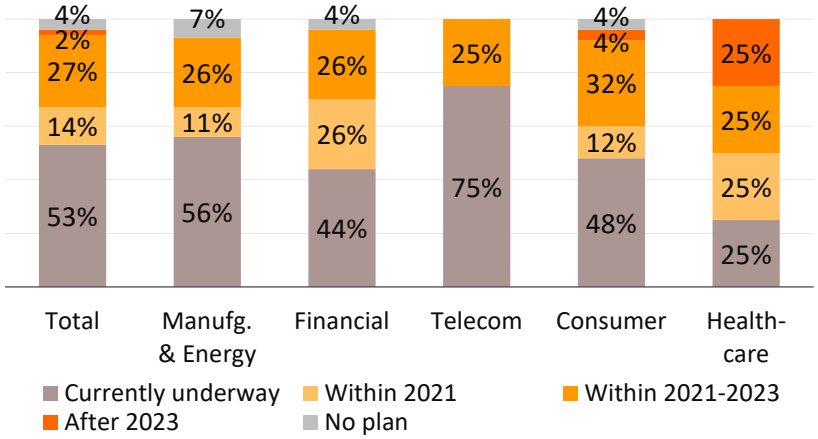


- **Investment in Thai digital industries started to pick up in 2015 with the introduction of 'Thai 4.0' industrial policy to drive innovation.** Investments accelerated in 2016-2017, when over 200 applications for BOI investment support in digital industries were approved annually, the largest investment in any of the new targeted S-curve industries. The strong interest as driven by the fact that digital industries play an important role in moving industry to a value-based economy. As such, the BOI offered tax incentives to investors in this area. Unfortunately, delays in developing infrastructure networks and national weakness in digital technology skills had hurt investments in digital industries, and they slowed in 2018-2019. However, looking at the total number of projects, digital industries remained the most attractive among the new target industries.
- **The COVID-19 pandemic had slowed investments worldwide in 2020. This was also felt in Thailand, where applications for investment support in digital industries slipped 6.5% by number and 55.1% by value.** Most applications (72.0%) were from overseas investors but the average size of each project has shrunk from an average of over THB50m in 2018-2019 to just THB24.5m in 2020. These new investments are concentrated in the main digital segments of enterprise software, digital services (including cloud services), where they are helping the financial sector compete over software-enabled services, and the development of digital platforms for use by e-commerce (BOI, 2020).

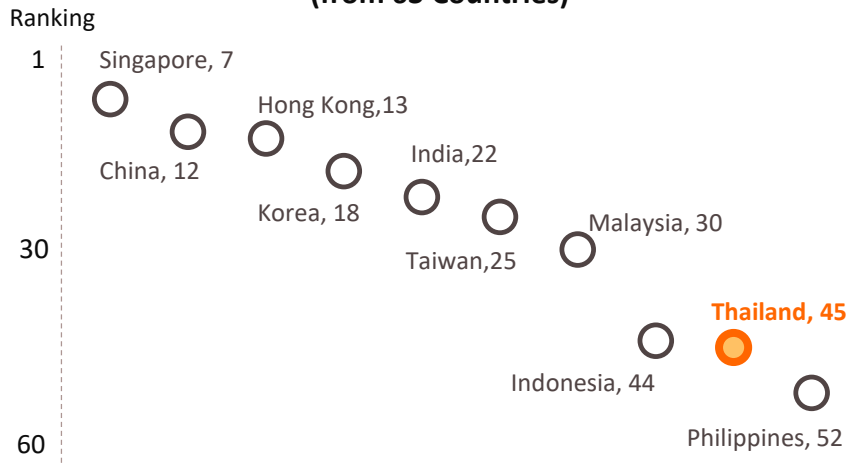
Source: BOI, Krungsri Research

In 2021-2023, investment in digital industries will rise with greater opportunities and support from the government

Share of Companies Planning to Invest in Digital Transformation by Industry



IMD Digital & Technology Skills Ranking 2020 (from 63 Countries)

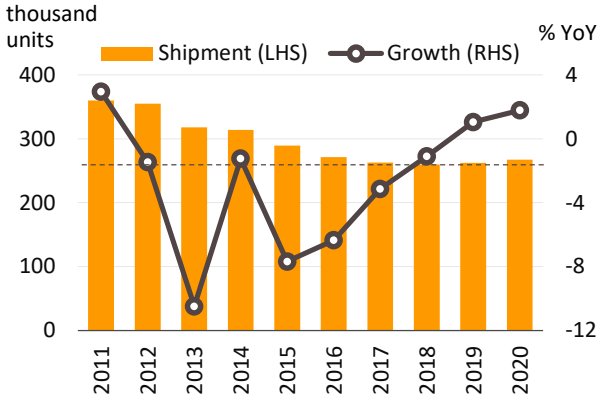


- **Krungsri Research forecasts investment in digital industries will rise in 2021-2023, helped by the following factors.**
  - **Market opportunities will increase as competition strengthens in the private sector in the post-COVID-19 environment, and companies increasingly turn to enterprise resource planning (ERP) systems that use digitally-driven strategies to propel business across the new, rapidly growing business landscape.** Thus, 96% of players in the Thai industrial sector plan to invest in corporate digital transformation. This will accelerate over 2021-2023, when companies in the financial, manufacturing and telecommunication sectors focus on investing in software, digital content and digital services (Deloitte, 2020).
  - **Government policy will help by pushing to develop digital infrastructure projects, and these projects should speed up in 2021.** This will include the development of smart cities, which is being piloted in the EEC, the creation of the Thailand 5G Ecosystem Innovation Center, a sandbox for the development of businesses to experiment with the commercial utilization of 5G technologies, and investment in megaprojects, which will connect transportation networks to the broader region. This will create a base for investment in hi-tech industries that are heavily dependent on digital technology.
- **Despite this, investment in digital technology will be limited by persistent problems with the national talent gap, in terms of both quantity of manpower available and the workforce's digital skills.** Thai businesses are facing an annual shortfall of around 27,000 digital workers per year (Digital Economy Promotion Agency: DEPA). Looking at quality, over the next 3 years, Thai industries will be looking for digital workers in the areas of data analysts, digital transformation specialists, digital marketing and strategy specialists (Deloitte, 2020). However, the Thai workforce is relatively less-skilled than that in competitor nations. This is reflected in the 2020 Digital & Technological Skills Ranking (IMD, 2020) which shows Thailand is falling behind other countries in Asia.

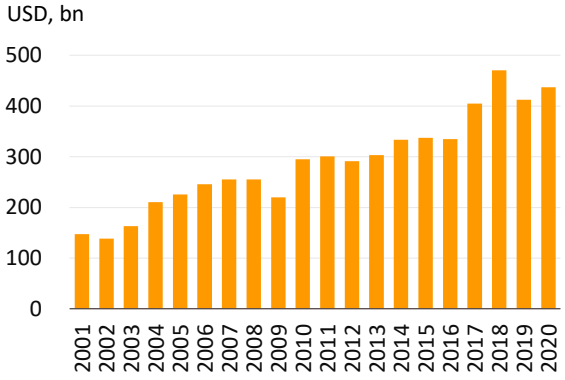
Source: Deloitte, IMD, Krungsri Research

HDD: Outlook should improve along with the recovering world economy

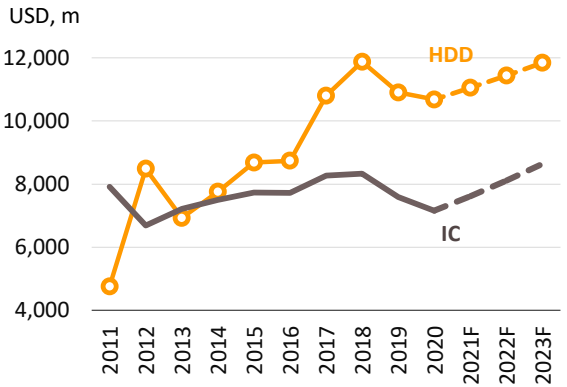
Worldwide PC Shipments



Worldwide Sales of Semiconductors



Electronics Exports Forecast

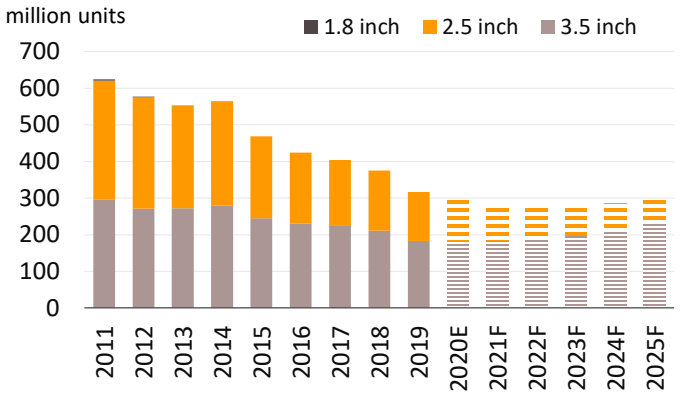


- **From 2021 to 2023, output of HDDs by Thai manufacturers should inch-up, but export value is projected to rise by an average of 3.0-4.0% per year.** The HDD segment will be boosted by the following factors.
  - **There will be rising demand for high-capacity 3.5-inch HDDs for cloud computing and data center applications.** The HDDs are used to store huge amounts of information for big data analysis. This market is experiencing strong growth; that has been lifted further by the latest outbreak of COVID-19 and the strong uptake of cloud computing services to meet the sudden expansion in working from home and distance learning.
  - **HDD manufacturers are constantly developing new techniques to extend the useful life of HDDs and expand storage capacity; the rapid advances are helping to reduce the price of HDDs per storage unit.** These new production and storage technologies rely on a range of breakthroughs, including helium hard drives, shingled magnetic recordings (SMRs), heat-assisted magnetic recordings (HAMRs) and microwave-assisted magnetic recordings (MAMRs). Together, these should help Thai players to preserve their HDD export market shares.

Source: Gartner, Semiconductor Industry Association (SIA), Ministry of Commerce (MOC), Krungsri Research

Still, there are several headwinds ahead

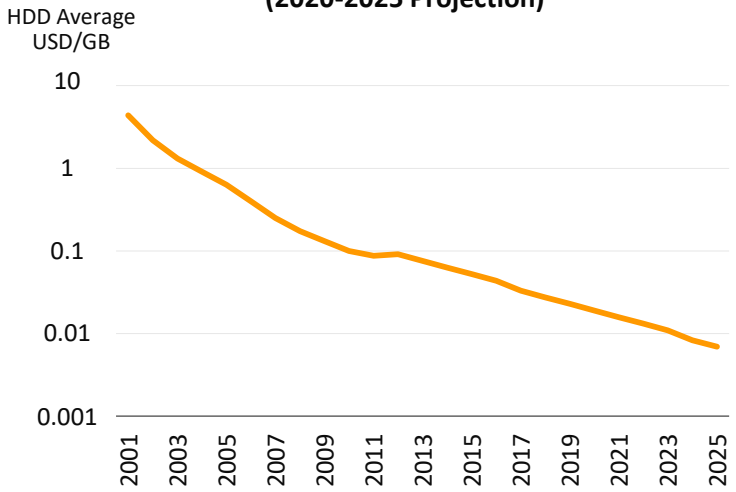
Global HDD Shipment Forecast by Type



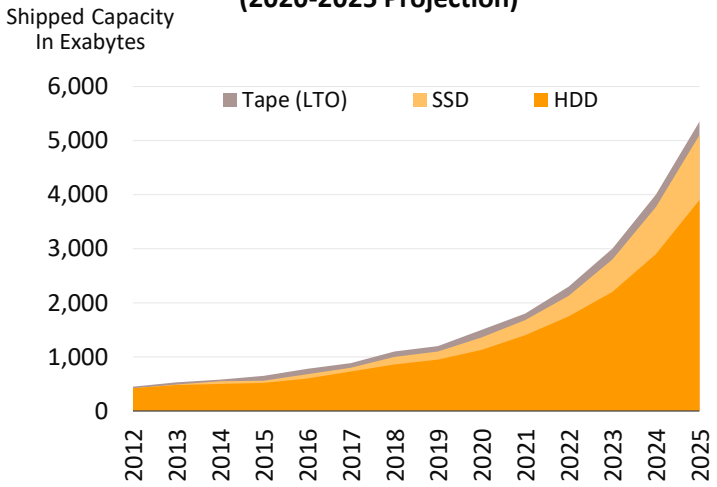
Note: 1.8 '' HDD is used in iPods and some smaller Netbooks.
2.5 '' HDD is used in notebooks and some servers.
3.5 '' HDD is a standard size used with PCs, servers, and other electronic devices.

- **(i) Demand for HDDs for use in PC assembly will weaken globally.** The IDC (September 2020) predicts that through 2021-2023, the number of PCs sold worldwide will fall by 2.0-4.0% per year.
- **(ii) HDD manufacturers will face greater competition from alternative products, most notably SDDs** that can replace the 1.8-inch (now discontinued) and 2.5-inch HDDs that are found in notebooks and other portable electronic devices. In these segments, SDDs are displacing HDDs, while tape drives continue to be used for permanent low-cost data storage or backup in situations where cost is more important or where access is infrequent, such as in some server and cloud computing applications.

Average HDD World Price per Gigabyte (2020-2025 Projection)



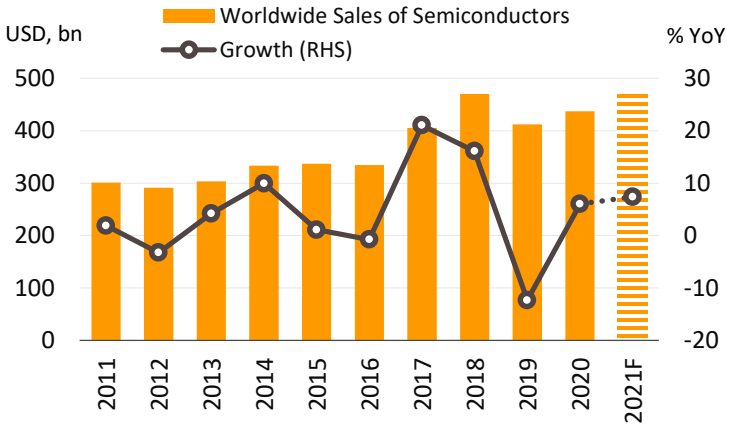
World Capacity Shipments for LTO TAPE, SSD, HDD (2020-2025 Projection)



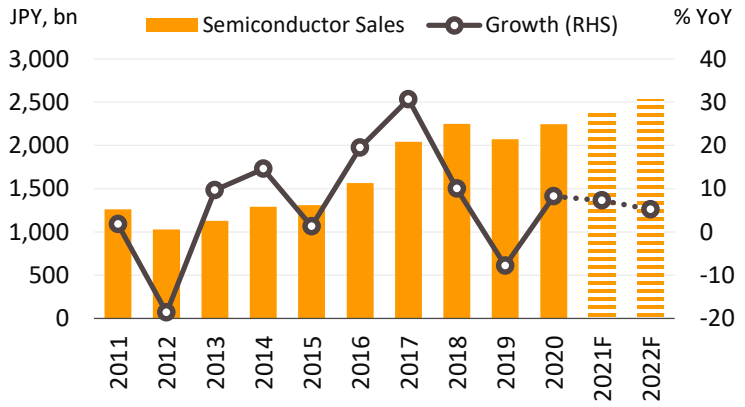
Source: Coughlin (Forbes; 29 May 2020), Krungsri Research

IC: Sunny outlook as supply shortage will ease soon given stronger investment in major countries

Worldwide Sales of Semiconductors and Forecast



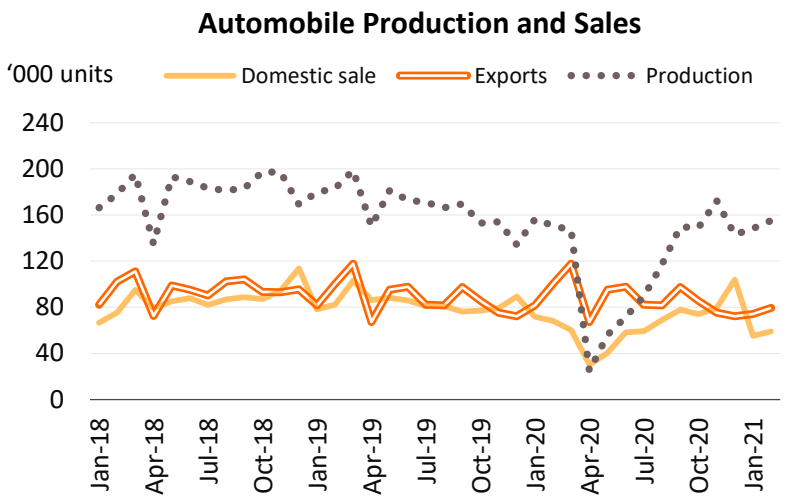
Semiconductor Sales and Forecast
(Japanese manufacturers Domestic and Oversea)

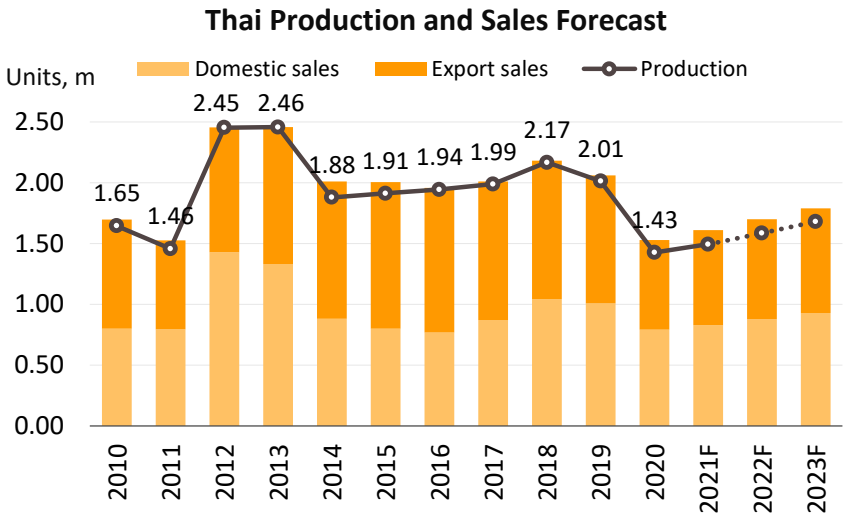


- **Export value is expected to rebound and grow by 6.0-7.0% this year (vs -5.7% in 2020),** in line with predictions by World Semiconductor Trade Statistics and the Semiconductor Equipment Association of Japan. This positive business environment will be supported by:
  - **A surge in working and learning at home triggered by national lockdowns, which led to strong demand for consumer electronics** such as PCs, notebooks, tablets, game consoles and smartphones.
  - **Global technology megatrends: (i) the development of auto technology, especially electric and autonomous vehicles,** will need greater software requirements, which will require more ICs (up to 150 compared to about 40 in a standard modern car); and **(ii) the new generation of 5G-compatible smartphones use around 40% more ICs than equivalent 4G devices.** The rollout of 5G technology is expected to accelerate soon, especially in developed economies. Hence, global investment in 5G network infrastructure backbones is projected to increase by 19% in 2021. This growth in 5G networks will also accelerate the adoption of the internet of things, which will feed into stronger demand for electronic goods and especially, ICs.
  - **The shortage of ICs and chips that has troubled the market since the end of 2020 is expected to subside in 2H21 as IC manufacturers in several countries ramp up production.** At the start of 2021, governments in countries with substantial indigenous technology industries (e.g., China, Taiwan, the US, and Japan) responded to the chip shortage by encouraging additional investment to expand domestic semiconductor and IC production capacity.

Source: World Semiconductor Trade Statistics (WSTS; December 2020), Semiconductor Equipment Association of Japan (SEAJ; January 2021), Krungsri Research

Automobile: Clear signs of recovery, so we raised forecasts for output, domestic sales and exports



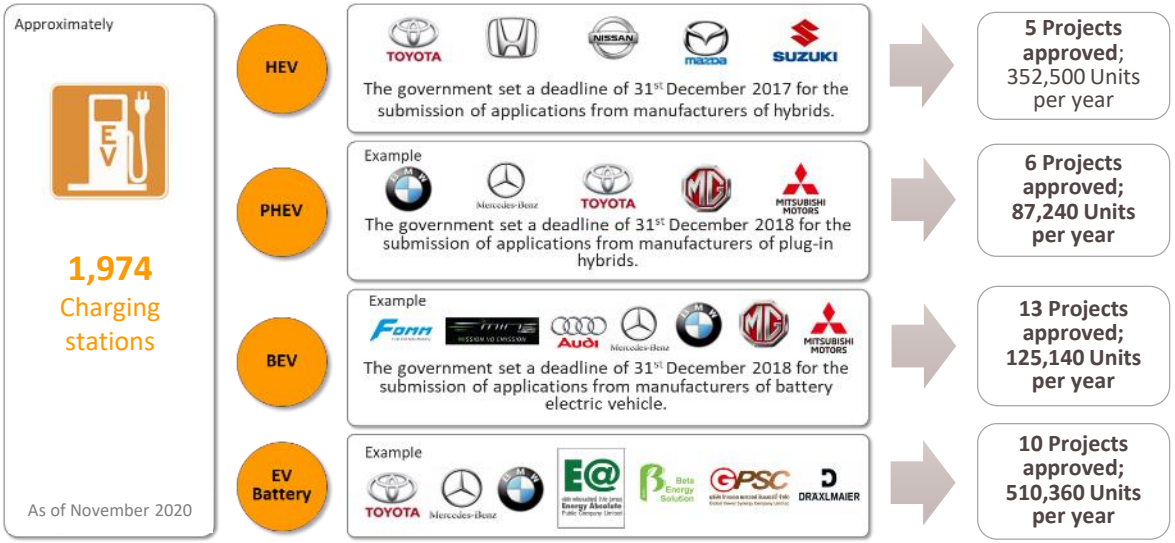


- **The auto industry has passed through its nadir and is now well along the road to recovery.** In 2M21, output reached 303,318 vehicles, down 1.2% YoY but a huge improvement from 2020 (fell 29.1%). In response to recovering demand both at home and abroad, manufacturers have been stepping up output and production lines have been turning out over 100,000 vehicles per month since August 2020. Hence, **Krungsri Research upgraded its 3-year output growth forecast for the industry, from 3.0-4.0% p.a. over 2021-2023 to 4.0-6.0% in 2021 and 5.0-7.0% in each of 2022 and 2023.**
- In 2M21, domestic car sales dropped 18.4% YoY to 114,168 vehicles (compared to a decline of 21.4% for full-year 2020). Demand recovery is most evident in the commercial vehicle sector, where demand is supported by the growth of online retail activity and the accompanying expansion in the logistics sector. Progress in the national vaccination program is also helping to lift consumer confidence, while manufacturers are using a range of promotions to stimulate sales and the resulting competition has created a 'buyer's market'. Given this, **Krungsri Research has upgraded domestic car sales growth to 4.0-6.0% in 2021, followed by 5.0-7.0% p.a. growth in 2022-2023** (against earlier forecasts of 3.0-4.0% p.a. growth for 2021-2023).
- 2M21 exports are also down, falling 4.3% YoY to 153,602 vehicles, but this is a substantial turnaround from the 30.2% decline in exports recorded for full-year 2020. And in the coming period, exports will continue to trend up, supported by the recovering global economy and export markets, as well as the closure of production facilities in the Philippines (with 7.1% share of exports by value, this is Thailand's 4th most important overseas market). Meanwhile, IHS Markit predicts the shortage of ICs for use in auto assembly will reduce global auto production by 1 million vehicles in 2021, or 1.67% of 2020 world output (77.6 million vehicles). The impact is very limited. In light of this, **Krungsri Research upgraded forecasts for exports from 4.0-5.0% annual growth in 2021-2023 to 5.0-7.0% in 2021 and 4.0-6.0% in 2022 and 2023.**

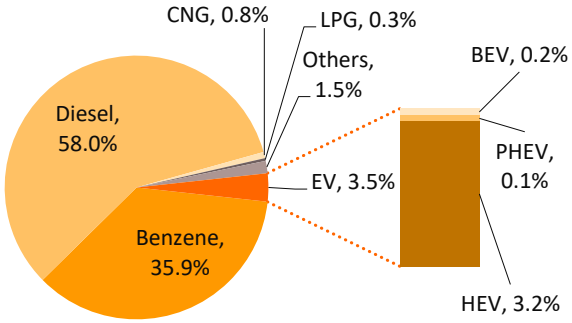
Source: FTI, Krungsri Research

Manufacturers are submitting applications for BOI support for investment in EV production

Investment Incentives for Electric Vehicles and Equipment



Share of Newly Registered Vehicles by Fuel (2020; total = 895,579)

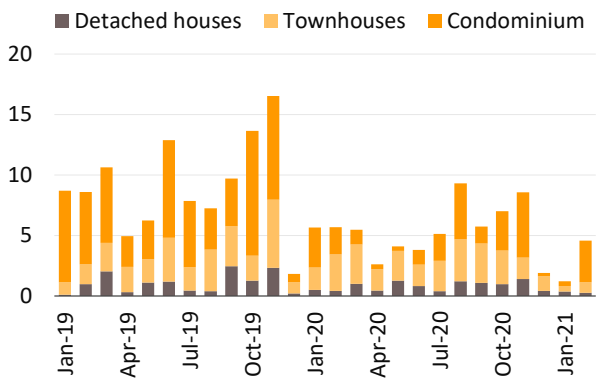


- **The BOI has passed a resolution to promote the production of EVs in Thailand. This aims to encourage the production of battery electric vehicles (BEVs),** but allows for the production of hybrids alongside these. This assistance falls into several different categories. (i) If manufacturers invest at least THB 5bn in the production of BEVs, they will be exempt from tax for 8 years, with additional benefits available to those investing in research and development. (ii) Companies that invest up to THB 5bn in BEV production will receive a 3-year tax waiver, although they may benefit from additional incentives if they meet other criteria, e.g., beginning auto production by 2022, producing major parts in addition to the basic components, assembling more than 10,000 vehicles per year, and investing in research and development. (iii) Manufacturers of plug-in hybrid electric vehicles (PHEVs) will receive a 3-year tax waiver, though they will also need to produce at least 3 EV parts.
- **Many auto manufacturers are already producing and distributing EVs.** For example, *Great Wall Motors* has applied for BOI investment support under this program for the production of hybrid, plug-in hybrid, and battery electric vehicles. The government has set a target that by 2030, 30% of Thai auto output (or 750,000 vehicles annually) should be EVs, though in 2020 new registrations of EVs only reached 30,928 vehicles (3.5% of all new registrations), comprising 28,419 hybrid electric vehicles, 1,418 battery electric vehicles, and 1,091 plug-in hybrid electric vehicles.

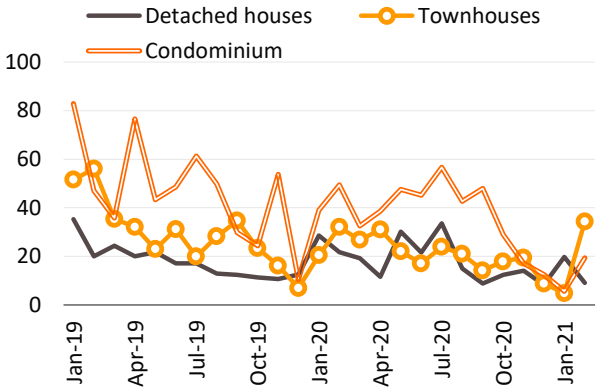
Source: BOI, Ministry of Energy, Department of Land Transport (DLT), Electric Vehicle Association of Thailand (EVAT), Krungsri Research

Real estate for sale: Operators are slowly releasing new projects in 1H21 to support 'real' demand

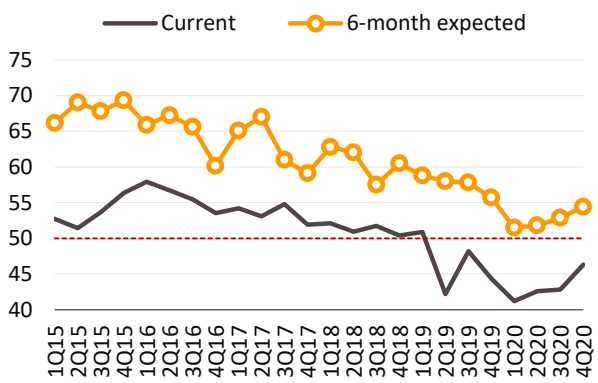
New Supply
(Thousand units)



Take-up Rate
(%)



Housing Developers' Sentiment Index
(HDSI)

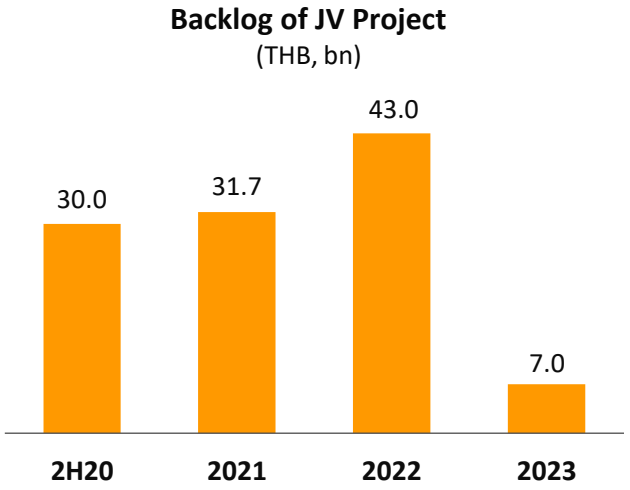


- **In February, the number of new residential units coming to market slipped 19.6% YoY to 4,583 units as developers responded to the new wave of COVID-19 infections and tried to preserve cashflow by slowing work on new projects and instead switched to selling off existing stock.** For town- and detached-houses, the number of new units dropped 70.9% YoY and 37.5% YoY, respectively. For condominiums, the low baseline last year caused a 52.2% YoY jump in supply. Take-up rate for detached houses, worsened in February to 9.2% (from 19.8% in January), but for townhouses and condominiums, they improved from 4.9% and 5.7% in January to 34.3% and 19.4%, respectively. This improvement was driven by developers running sales campaigns that offered more-attractive-than usual promotions, which encouraged buyers (especially those motivated by 'real' demand) to make positive purchasing decisions.
- **In 1H21, supply of new properties should improve relative to 1H20 as developer confidence picks up and the mass vaccination program effectively reins in the COVID-19 crisis.** Supply will rise as developers push forward with new projects and projects that were delayed in 2020 are brought to market this year. In line with this, developer confidence 6 months out is improving. However, high and rising household debt levels will weigh on demand, directly affecting the ability of buyers to afford new houses and encouraging lenders to tighten the release of new credit. At the same time, ongoing restrictions on international travel means demand from foreign buyers will remain depressed and limit developers' revenues.

Source: AREA, Real Estate Information Center (REIC), Krungsri Research

Joint ventures with foreign investors will tend to switch from condominium to low-rise developments

SENA JV Hankyu Hanshin Properties Corp. (Japan) low-rise housing	THB0.9bn
Property Perfect JV Hongkong Land (Hong Kong) low-rise housing	THB1.0bn
Property Perfect JV Sekisui Chemical (Japan) low-rise housing	THB1.0bn
Property Perfect JV Sumitomo Forestry (Japan) Condominium	THB2.0bn

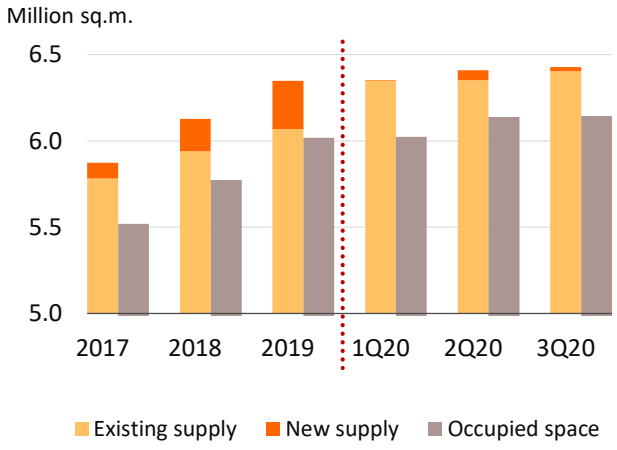


- **In the coming period, players will continue to seek overseas partners. This will remain an important business strategy since foreign investors are still a solid and identifiable source of capital.** However, the developments targeted by these investors will likely change, and in place of high-rise projects, investors will increasingly favor working on low-rise developments. This move is partly being driven by changing consumer preferences and the greater importance that buyers are placing on access to usable space that allows owners to work from home, and partly on ongoing urban development that is bringing much-improved train and road links and better shopping possibilities to more suburban areas.
- **In 2021, joint investments in property projects will be increasingly carried out by Thai investors with a track record in this area. And, players will be involved in more projects.** For instance, *Sena Development* is working with Japanese developer Hankyu Hanshin Properties on a project, THB900m low-rise development in Thepharak. *Property Perfect* is working with three foreign partners on three different projects with a combined value of THB4bn: Hongkong Land Holdings (development of detached houses in Chaeng Wattana and Bang Na-Suvarnabhumi), Sumitomo Forestry (condominium projects in Thong Lor) and Sekisui Chemicals (existing projects in three areas but investment has increased).

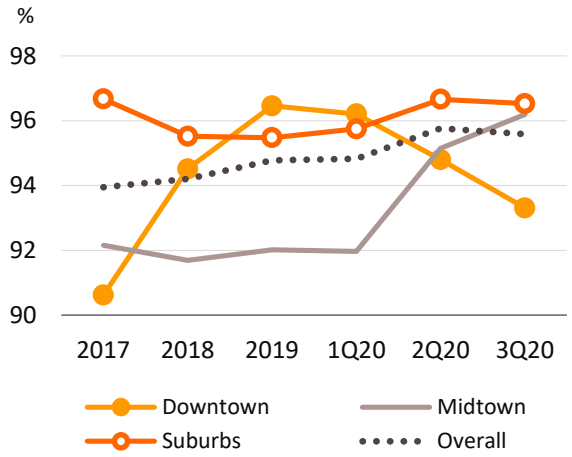
Source: Asiaplus, Krungsri Research

Real estate for rent: In 1H21, recovery in demand will be restricted to the domestic market

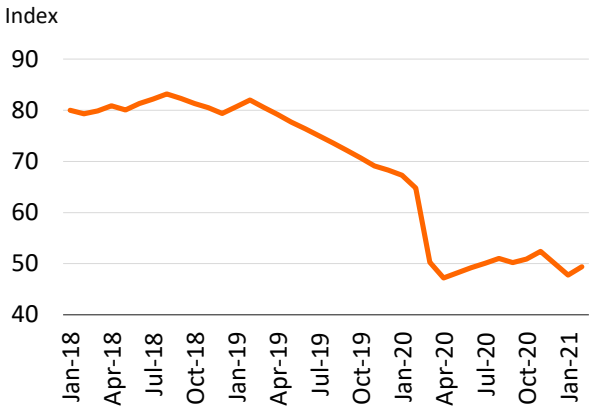
Existing and New Supply



Occupancy Rate by Area



Consumer Confidence Index: CCI

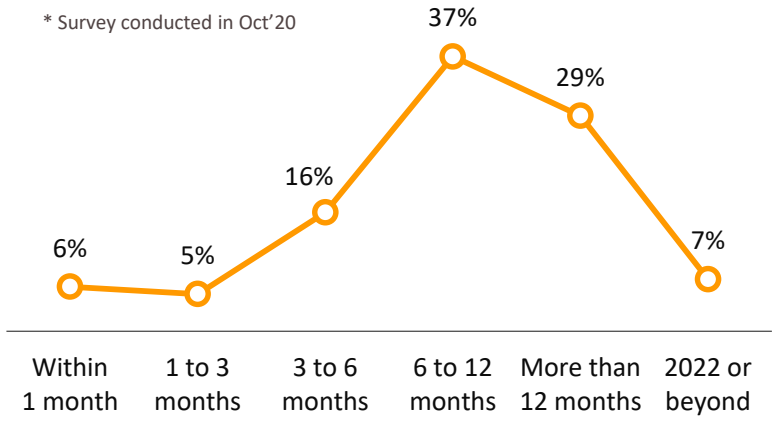


- **In 3Q20, operators released just 25,000 sq.m. of new rental retail space to the market as they wanted to preserve liquidity.** At the same time, landlords were forced to use aggressive pricing strategies to prevent lessees from canceling their contracts, especially in downtown locations where occupancy rates were softening.
- **In 1H21, operations that rent out retail space benefited from (i) government stimulus measures, including the 'We Win', 'Measure 33'and 'Half Each' programs, and (ii) progress in the COVID-19 vaccination program, with the first group vaccinated in March.** This helped to improve consumer sentiment, which lifted the Consumer Confidence Index (CCI) to 49.4 in February from 47.8 a month earlier, the first such rise in 3 months. Nevertheless, recovery will remain limited by businesses that are dependent on tourism. And unfortunately, the last wave of infections had discouraged domestic tourism activities while international travel remains restricted.

Source: CBRE, Krungsri Research

Retail space operators will continue to develop new projects, especially in the suburbs and upcountry

Time Needed for Business Activity to Return to Pre-Pandemic Levels (% of respondents)*



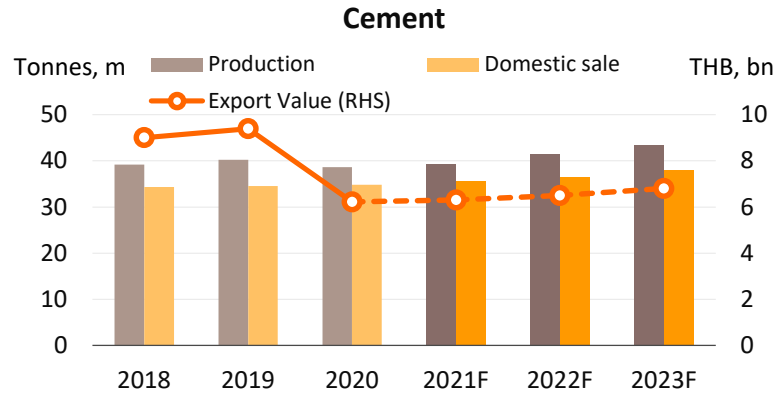
Upcoming Mixed-use projects is scheduled to open in 4Q21

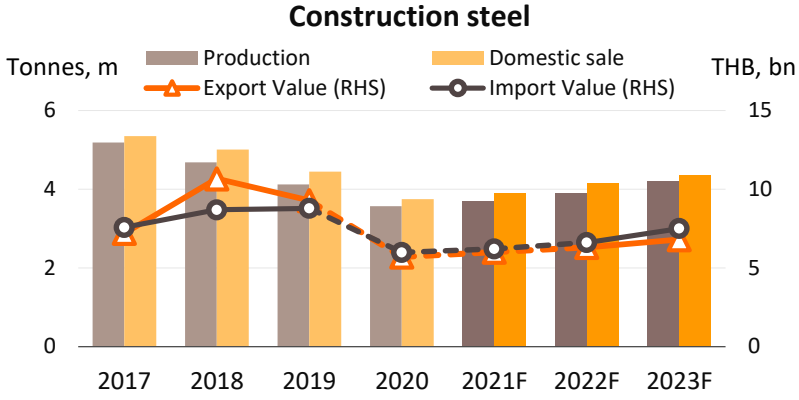


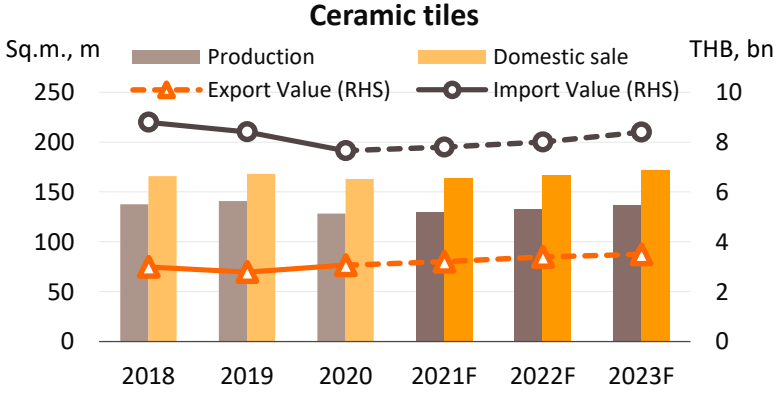
- **Recovery in the rental retail space market should accelerate in 2021 thanks to the relaxation of social distancing measures and government efforts to stimulate spending**, for example, the 'Half Each' and 'Shop and Refund' programs, and possibly similar measures in the future. A survey of rental tenants of retail space in the Asia-Pacific region out by CBRE in October 2020 revealed the majority believed business conditions would recover to pre-pandemic levels in 2H21. Hence, developers are sticking with plans to steadily release mor new retail properties to the market.
- **However, consumer behavior is changing, and the digital era means online shopping will be a part of daily life.** In response, operators have had to develop strategies to entice consumers back into shopping malls Especially for large players, this meant investment in modernizing and upgrading existing properties and working on new developments. Thus, *Central Pattana* plans to open two new malls in 4Q21 at a cost of THB15-20bn. *The Mall Group* is spending THB20bn to modernize 4 sites (The Mall branches in Thapra and Bangkae in 2021, in Bang Kapi in 2022, and The Emporium in 2023) and another THB20bn to develop the Bangkok Mall (on Bang Na-Trat Road) which should open in 2023. The market in Bangkok is increasingly crowded and the presence of large shopping malls across the city means new opportunities are thin on the ground. In response, players are increasingly looking to invest in suburban areas around Bangkok and in more promising upcountry areas, where consumer purchasing power is now at a level that can support an extension of this market. This will allow businesses to develop new income streams and to serve Thai consumers, rather than depend on tourist arrivals which remains weak.

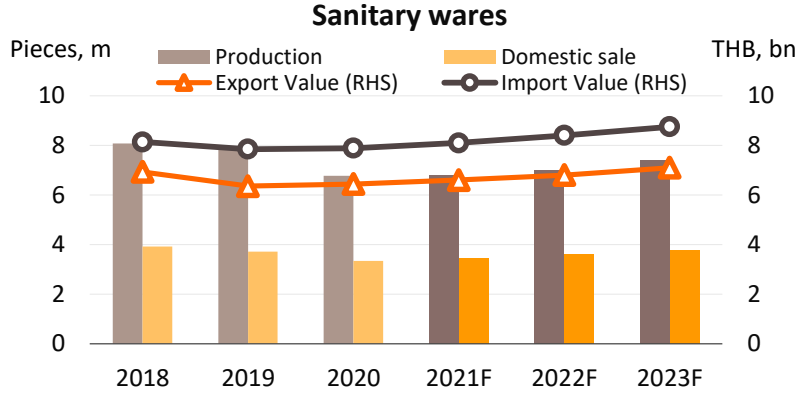
Source: Asia Pacific Retail Flash Survey, CBRE, CPN, Krungsri Research

Construction Materials: Production and sales will rise in line with anticipated growth in public-sector investment









- **Demand for cement will be boosted by the rising volume of domestic construction activity, especially public-sector infrastructure projects.** In addition, several new real estate projects are expected to be launched in the EEC and along mass transit routes in Bangkok. Exports will also rise, especially to the CLMV market where growth will be driven by respective government's plans to invest in the infrastructure required to support ongoing economic growth. **Recovery of private-sector investment in residential accommodation will support a better outlook for producers of ceramic tiles and sanitaryware but high inventory levels will limit output growth.** The government has introduced the 'Thailand First' policy to increase the use of local construction materials for infrastructure projects, and at least 90% of construction steel used in these will have to be Thai-made. This will boost demand for Thai products.

Source: OIE, Iron and Steel Institute of Thailand (ISIT), Krungsri Research

Private hospitals are investing in the eastern region to capture the 10-million resident market

Bangkok Dusit Medical Services PCL

- Opened the 230-bed Jomtien Hospital inn2020 to provide general hospital services, mainly to Thai patients.
- Operates 3 brands in the eastern region: Bangkok Hospital, Samitivej Hospital and Phayathai Hospital. Within Chonburi, the group operates 4 hospitals (Bangkok Hospital Pattaya, Samitivej Sriracha Hospital, Samitivej Chonburi and Phyathai Hospital Sriracha) that account for combined 50% of the 1,500 beds in private hospitals in Chonburi.
- Increased investment in Bangkok Hospital Rayong to expand capacity, making it the group's 10th 'center of excellence'.
- Expanded capacity at Sri Rayong Hospital to 203 beds from 55.
- Increasing investment to meet rising demand from healthcare businesses, including building a lab in Rayong and expanding the 'Save Drug' pharmacy network.

Bangkok Chain Hospital

- Focuses on Chachoengsao given rising spending power, easy connection to Highway 304 which links to a large number of factories, and the area has about 400,000 individuals with health insurance.
- Opened Kasemrad Hospital in Prachinburi in January 2021. This has 115 beds and will provide healthcare services to insured Thais and non-Thais working in the 304 Industrial Park.



Local entrepreneurs

- Owns the 30-bed Piyawetch Hospital in Amphoe Pluak Daeng, Rayong province. Established Piyavejj Nikhompattana Company Limited in Bo Win, Sri Ratcha, Chonburi.

Chularat Hospital

- Increased capacity at Ruam Phaet Hospital in Chachoengsao to 115 beds.
- Plans to open new hospitals in Chonburi and Rayong provinces.

Thonburi Healthcare Group

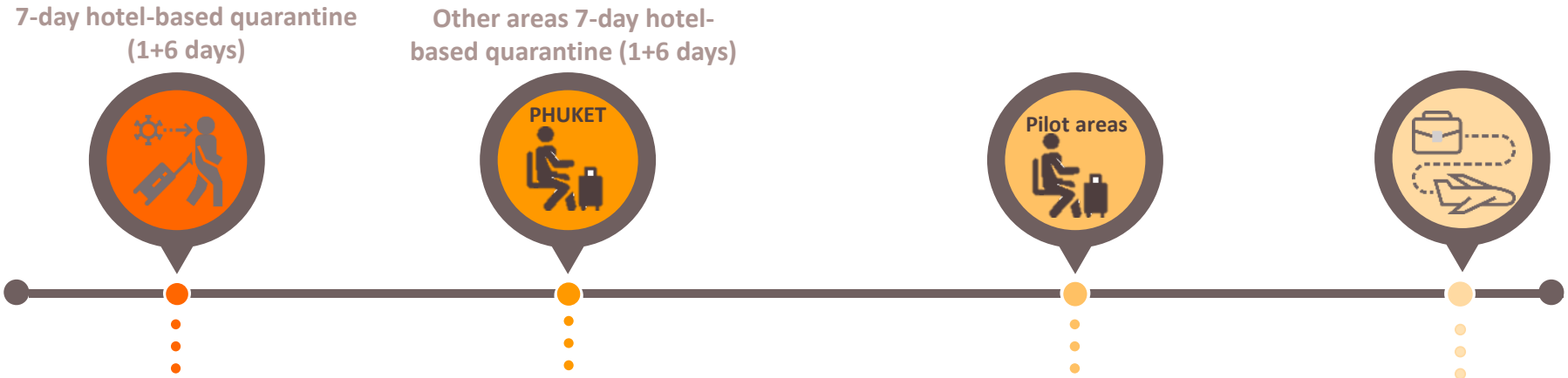
- Plans to invest in the production of latex gloves for export at 4 locations, 3 in the EEC and 1 in Pluak Daeng in Rayong (in 2021 and 2022). Total investment will be about THB35bn.

- **Throughout 2021, officials will promote investment in the healthcare sector because it has strong growth potential and has received a boost from the COVID-19 crisis.** As part of this, the government has invested in many projects connected to biotech and medical infrastructure located in the EEC, including Genomics Thailand. It is a human genome database drawn from the Thai population that will be used to support development of the medical sector, together with other schemes that involve the use of genetic technology to treat illnesses. This would attract investors to the healthcare sector.

Source: National Statistical Office (NSO), United Nations, NESDC, Krungsri Research

Hotels: Vaccination and easing quarantine measures

Roadmap for the reopening of the country to vaccinated tourists



Apr – Jun 2021

Major tourist areas

- Phuket
- Krabi
- Phang Nga
- Koh Samui
- Pattaya
- Chiang Mai

Jul – Sep 2021

Phuket Sandbox

- Tourists who are fully vaccinated and present a negative COVID-19 test may fly direct to Phuket without the need for a quarantine. Tourists will be required to remain in Phuket for at least 7 days, but following this, they will be able to travel to other parts of the country.
- Other measures that may be used include vaccine certificates and contact-tracing apps.

Jul – Sep 2021

- Tourists who are fully vaccinated and present a negative COVID-19 test will have to stay in the pilot areas for at least 7 days, but following this, they will be able to travel to other parts of the country.
- Other measures that may be used include vaccine certificates and contact-tracing apps.

Pilot areas: Phuket, Krabi, Phang Nga, Koh Samui, Pattaya and Chiang Mai

Jan 2022 onwards

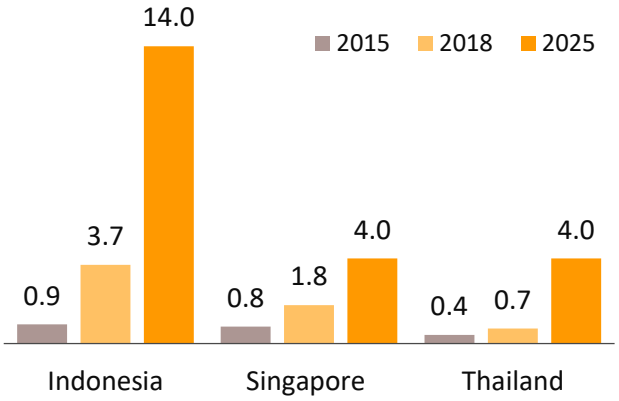
Country fully open

- **The government plans to slowly relax quarantine requirements for foreign arrivals to Thailand. It is hoped that in October, tourists will be able to start traveling to the 6 pilot regions without being subject to quarantine. And by January 2022, the country should fully reopen to foreign tourists.** The government now forecasts 6 million foreign arrivals in 4Q21, with arrivals for all of 2021 coming in at 6.5 million, while domestic tourists are expected to make 160 million trips this year. Krungsri Research sees only 4.0 million foreign tourists arriving in Thailand in 2021, but this will rise to 11.4 million in 2022 and to 26.4 million in 2023 (compared to 40 million in 2019). Thai tourists are expected to make 110 million domestic trips this year, 125 million in 2022, and 145 million in 2023. Occupancy rates are expected to average 40% in 2021, 50-53% in 2022, and 60-63% in 2023.

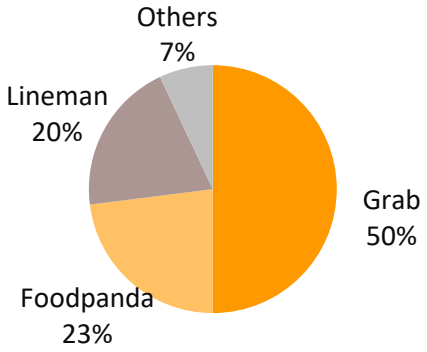
Source: Ministry of Tourism and Sports (MOTS), Tourism Authority of Thailand (TAT), Krungsri Research

Restaurants: Businesses increasingly dependent on delivery services

Food Delivery Market Size (USD, bn)



Market Share of Online Food Delivery Apps in Term of GMV* in Thailand



Note: GMV referred to Gross Merchandise Volume

Major Food Delivery Aggregators in Thailand

New entrant

- **The much-needed lockdowns to prevent the spread of COVID-19 included banning indoor dining in restaurants for a period.** Euromonitor estimates that 2020 sales from full-service restaurants in Thailand fell by 28% in current value terms to THB135.1bn. In response to social distancing and stay-home measures (including the surge in working from home), customers switched to ordering food for home-delivery, and this fed into the rapid growth of food delivery apps.
- **Uptake of services available through food delivery apps is expected to continue to grow, supported by: (i) a fast-paced lifestyle, (ii) increasing use of smartphones, and (iii) increasing urbanization.** Google predicts that the value of the ASEAN food delivery market will reach USD20.0bn in 2025, up from just USD3.7bn in 2018, led by Indonesia where the market will be worth USD14.0bn. In Thailand, the home food delivery market is expected to be worth USD4.0bn by 2025 (on par with Singapore), up five-fold from 2018 when it generated only USD0.7bn.
- **At present, the market for food delivery apps in Thailand is dominated by 2 players, GrabFood and FoodPanda.** These have a combined GMV of 73% but although they are enjoying continuing sales growth, new entrants (e.g., Robinhood) are competing for market share. To maintain and expand their customer base, operators will need to review their marketing strategies, including cutting prices and running promotions, but consumers will benefit from the greater range of choices available.

Source: Statista, Momentum Works, Krungsri Research

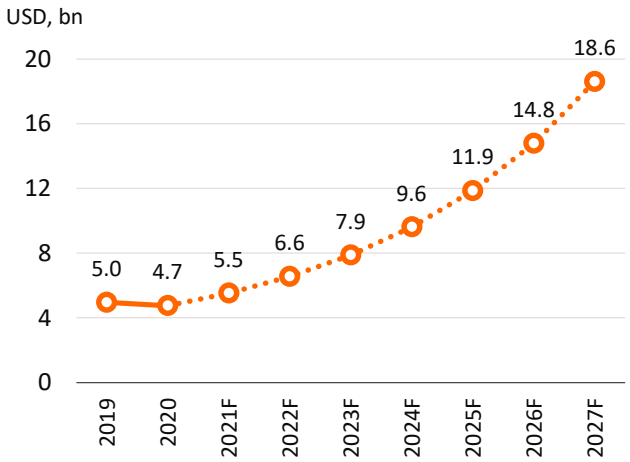
Hemp industry offers new investment opportunities

Thailand's Hemp Industry Supply chain

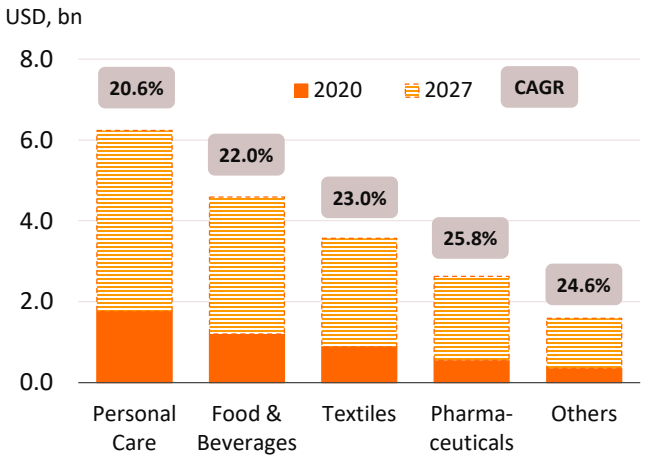


	UPSTREAM	MIDSTREAM	UPSTREAM		
	GROWER • Seed supplier, import, export, distribution of seeds, commercial cultivation, develop plant species	**EXTRACTOR** • Producers of hemp seed oil, hemp powder, hemp thread	**HEMP FINAL PRODUCTS** • Manufacturers who use extract or intermediate hemp products as raw materials or ingredients in their products, such as personal care, food & beverage, pharmaceuticals, supplements, cosmetics, textiles, apparels, paper, construction materials, etc.		
List of companies that expressed interest in investing in the hemp industry	• Charoen Pokphand Foods • Chayo Group • Gunkul Engineering • R&B Food Supply • Sri Trang Agro-Industry • Tobacco grower	• DOD Biotech • Gunkul Engineering • Inter Pharma • R&B Food Supply • K. W. Metal Work • JSP Pharma	• After You • Asian Sea Corporation • Bangkok Chain Hospital • Beauty Community • Carabao Group • DOD Biotech • Do Day Dream • Exotic Food • Global Consumer	• Ichitan Group • Inter Pharma • JKN Global Media • Karmarts • Malee Group • Mega Lifesciences • NR Instant Produce • Oishi Group • Osotspa	• Praram 9 Hospital • PTG Energy • Rojukiss International • RS • Sappe • Siam Wellness Group • T.A.C. Consumer • Tipco Foods • Zen Corporation Group

Global Hemp Market Value



Global Hemp Market Value (By Application)



- The liberalization of the rules governing the cultivation and use of hemp would turn that into a valuable agricultural commodity. This makes it an increasingly attractive investment target.
- Krungsri Research believes hemp cultivation will be a 'blue ocean' industry in Thailand. **Many companies are now interested in establishing a presence in upstream, midstream and downstream sections of the hemp supply chain.**
- **In 2020, the world market for hemp was valued at an estimated USD4.7bn. It is expected to grow rapidly to USD18.6bn by 2027.** Hemp is grown mainly for use in personal care products, by food & beverages, textiles, and pharmaceuticals.

Source: ONCB, Fusioncbd, SET, NESDC, Allied Market Research, Royal Thai Government Gazette, Krungsri Research

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