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2024-2026
THAILAND
INDUSTRY OUTLOOK
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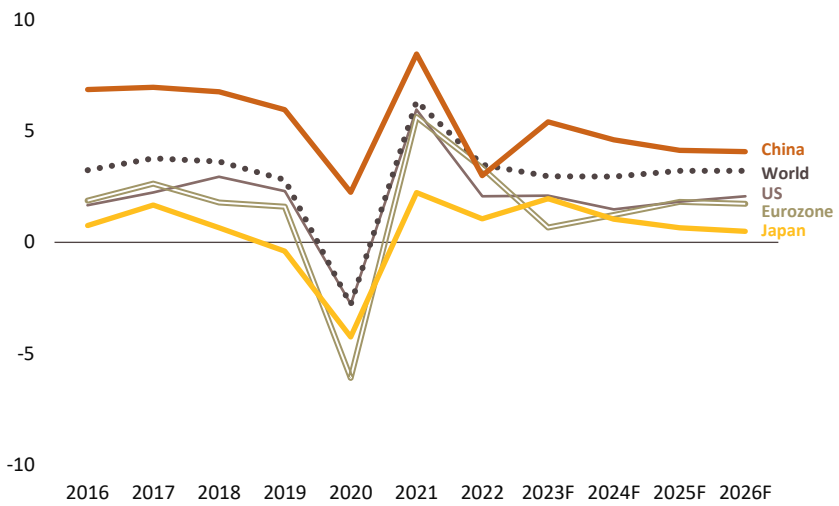
2024-2026 THAILAND INDUSTRY OUTLOOK

The Thailand Industry Outlook over the next 3 years (2024-2026) covers a range of factors impacting the industries. Those factors include opportunities and challenges that represent the attractiveness of each industry depending on the macroeconomic environment and sector-specific factors.

The macroeconomic environment

- **The global economy, 2024-2026: Growth will remain low as the post-COVID reopening boost dissipated and trends towards the fragmentation of globalization gather pace.**
  - **Over the next 3 years, the global economy is forecast to see sub-par growth,** averaging just 3.1%, and although this will be fractionally up on 2023's expected 3.0%, it will be below the 3.7% averaged over the decade prior to the COVID-19 pandemic. Growth will be undercut by the fading of the impetus provided by the ending of pandemic restrictions and the reopening of countries worldwide, while many additional factors will also drag on the global economy, including the slowdown in China, the risk of a recession in the EU, the impact of El Niño phenomenon in the Pacific, unrests in different parts of the world and its knock-on effects on global trade and energy prices, and the decoupling between the US and China, which is disrupting supply chains and has the potential to significantly impact world trade and investment, thus accelerating the fragmentation of globalization. In addition, the still-tight monetary policy and the high level of interest rates over 2023 and 2024 will add to the costs of financing public and private sector debts. Overall, the world remains at risk of extended sluggishness, though this will help to dampen inflationary pressures over the latter half of 2024, thus opening the way for the advanced economies to cut rates and head off an extended slump.

Figure 1: GDP Growth (%)



Source: IMF World Economic Outlook (October 2023), except China's growth projected in November 2023

- **US growth is expected to underperform its long-term average over 2024-2026.** The economy is forecast to expand by 2.1% in 2023, but growth will fall to 1.5% in 2024 before climbing to 1.8% and 2.1% in 2025 and 2026. This will still be below the average of 2.3% maintained through the decade from 2010 to 2019. Inflation should ease back to the 2% target in 2025, but the Fed will need to keep policy rates elevated through mid-2024, and this will pressure consumption, investment, and employment in 2024. Over 2025 and 2026, weakening inflation will help economic growth to improve, which will be helped further by expected stimulus measures following the 2024 elections. The outlook will also benefit from the beginning of a loosening of policy rates, and it is probable that the Fed will cut rates to 4.5% in 2024 and 2.5% in 2025, a level that will support long-term economic growth. Nevertheless, following the pandemic, public debt has reached worrying new highs, geopolitical tensions remain intense, and decoupling between the US and China may place new stresses on the world economy, and so risks to the US remain considerable over the medium-to long-term.

- **Eurozone is at risk of slipping into a mild recession in 2H23, and the growth outlook will remain sluggish.** Over the year 2024-2026, annual growth is expected to average just 1.6%, declining from 3.3% in 2022, due to the expected impacts of the continuation of the war in Ukraine on trade and energy sources, the drag placed on investment and consumption by the sustained high interest rates, and the consequences on exports of weak global demand. The Eurozone region is thus now expected to enter a mild recession in the second half of 2023 before recovering somewhat over the years between 2024 and 2026. These gains will be at least partly explained by low-base effects and easing inflationary pressure. The economy will also benefit from a likely loosening of monetary policy, and the European Central Bank is expected to cut policy rates by the middle of 2024.

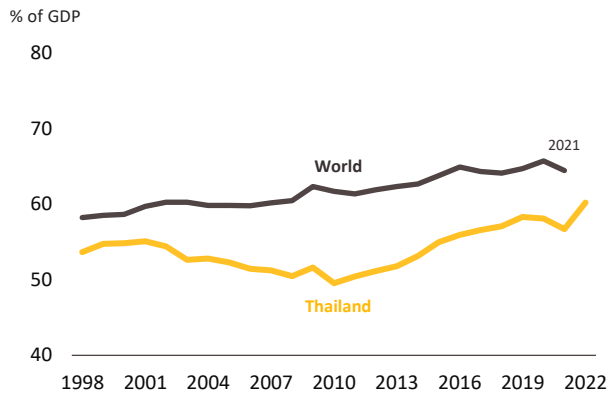
- **Slowing export demand is weighing on the Japanese economy,** and growth is forecast to slide from 2.0% in 2023 to 1.0%, 0.7%, and 0.5% in each of the following 3 years as the effects of ongoing sluggishness in the world economy and the challenges posed to Japanese auto exports by low-cost Chinese EVs become more evident. However, in 2024, private consumption is expected to gradually recover backed by improving real income growth (smaller negative), fiscal stimulus packages, and further recovery in tourism sector that would help support economic growth over the next 3 years. Recovering domestic demand and possible wage hikes might support the view that inflation would remain high enough to meet its 2% target. Hence, the Bank of Japan (BOJ) might pivot away from unusual monetary stimulus by ending its negative interest rate policy (NIRP) and possibly expanding the 10-year yield curve control (YCC) in 2024.

- **The Chinese economy will slow under the weight of unresolved structural problems and external pressures.** Growth is forecast to weaken from 5.4% in 2023 to an average of 4.3% over the three years from 2024 to 2026, significantly below the 6-7% prior to the pandemic. A range of factors will conspire to weaken the economy, including a slowdown in global trade, China's long-running real estate crisis, the excess production capacity in many industries, and high debt levels in both private and public sectors, which will negatively impact the financial sector, businesses, and households. Over a longer timescale, demographic changes and the transition to an aging society will likely lead to a structural weakening of growth rates. However, several positive factors will prevent a sharp slowdown. These include ongoing investment in infrastructure, support for technology-based and environmentally friendly manufacturing industries, and targeted monetary and fiscal policies. Going forward, risks remain significant. In particular, there is a possibility that worsening China-Taiwan and China-US tensions may accelerate global economic decoupling, adding to risk for global economic and financial systems, and threatening supply chain disruptions, especially for high-tech goods.

Structural changes in the world economy will disrupt the business environment

- **The global economy is transitioning to a much greater focus on services,** and so the service sector has a growing role to play in generating income and employment, improving the efficiency of manufacturing industries, raising competitiveness, and driving overall growth in the economy. Moreover, service industries such as transport, finance, and telecommunications now occupy key intermediate roles in manufacturing supply chains. As elsewhere, the contribution of the service sector to the Thai economy has strengthened with time, and as of 2022, services accounted for 60.2% of GDP (Figure 2). At present, only 53% of all jobs are in the service sector, figures that are far off the average for advanced economies such as the US and the UK, where services account for around 75% of GDP and over 70% of employment. In addition, the Thai service sector is still reliant on traditional services, in particular tourism and unskilled work in areas such as wholesale and retail, and hotels and restaurants. By contrast, in advanced economies, modern services such as IT, intellectual property, and finance predominate. As these involve greater use of advanced technology and entail much more highly skilled work, they are able to add much more value to the service sector and to the economy overall.

Figure 2: Share of Service Sector in GDP



Source: World Bank, Office of the National Economic and Social Development Council (NESDC)

Following the end of the COVID-19 pandemic, services have played an important role in powering economic growth in Thailand. The rebound in the tourism industry and in related parts of the economy has been especially important. Nevertheless, this excessive reliance on traditional services carries with it an elevated level of risk since this exposes the economy to negative impacts arising from domestic and international events such as political upheavals, troubles in the global economy, outbreaks of disease, and natural disasters. It is thus **important that Thailand shifts to a greater emphasis on modern services** and increases the extent to which information and communication technologies are used to drive the creation of added value, especially in: (i) traditional services where Thailand enjoys a competitive advantage (e.g., high-value medical and health tourism), since these are areas that draw on goods and services from other parts of the economy as inputs; and (ii) manufacturing industry, from upstream areas (e.g., research and development, design, and sourcing inputs) through to downstream processes (e.g., transport and distribution, brand building, and after-sales services). This would then put the Thai economy on a much more sustainable long-term footing and help build resilience in the face of both internal and external shocks.

Unfortunately, increasing the share of GDP coming from the service sector may be a long and drawn-out process. ***(i) The Thai workforce lacks the relevant skills in technology,*** which then drags on innovation, and there is endemic weakness in the supporting business ecosystem, particularly in research and development and in the commercial infrastructure (i.e., regulations, technology, finance, incentives, and data insights). ***(ii) Compared to advanced economies, the Thai regulatory environment places considerable hurdles in the way of foreign investment in the service sector,*** and so of the 51 countries surveyed in the 2022 OECD Services Trade Restrictiveness Index, Thailand ranked 50th. The barriers facing investors in the Thai service sector are therefore more formidable than for almost all of Thailand's competitors, with the result that inflows of investment and technology are limited and the potential positive impacts of this on service sector innovation are being squandered. In light of this, it is imperative that **the public and private sectors together address these challenges and to shift the country to a service-based economy. While failure in this endeavor will merely repeat past errors, success will help to ensure that the country is securely on the path to long-term sustainable growth.**

- **Modern technology** has assumed a place of primary importance in the modern world, and industries now deploy smart innovations to compete intensely against one another, to build long-term sustainable value-added, and to address our environmental problems. Over the next three years, technologies and innovations that are likely to be particularly important will include the following.

  - **Artificial intelligence (AI) and Generative AI (GenAI):** In the past year**,** no technology has shaken the world quite like AI, especially generative AI. GenAI is a type of AI that can generate novel output not present in its training data, and this ability to 'think' creatively marks a significant break with earlier assumptions that creativity was a uniquely human trait. Moreover, GenAI can produce output in a range of forms, and in addition to responding in the text to text-based queries and inputs, they can produce images, audio, and video; they can design; they can produce computer code; and they can generate synthetic data. GenAI is applicable in many industries as well as expediting the work process.

  - **The Internet of Things (IoT):** High-tech manufacturing plants are using networks of sensors to collate information and manage production processes, and this will become more common in areas such as auto assembly and the manufacture of auto parts and electronics. The IoT is also finding a role in service sector businesses, where coupled with AI, it can improve the speed and accuracy with which services are delivered, for example, in hospitals and airports.

  - **Robotics:** The use of robots in place of human labor in both the manufacturing and service sectors is spreading worldwide, partly as a result of the aging of society and worsening labor shortages. This is especially so in areas where work is repetitive and clearly structured, such as when providing customer services in airports and retail centers, where work is dangerous, for example moving goods in logistics centers, and where industrial processes can easily be automated. As of 2022, there were around 3,300 robotics units in use in Thai industries, putting Thailand in 14th place in the world rankings and 2nd in Southeast Asia after only Singapore (source: International Federation of Robotics).

  - **Blockchain:** As platforms become available that make the delivery of new services possible, blockchains are finding novel use-cases in parts of the economy from finance and banking through to entertainment and online gaming. The total global value of blockchain solutions is therefore expected to increase 22.3% to USD 23.3bn in 2023 (source: efinancethai.com).

  - **3D printing:** This is increasingly being used in high-volume product design to meet diversified consumer demand. In particular, 3D printing can be used in areas where fast and precise production is required with low unit costs, for example in the production of electronics, medical devices, and construction equipment.

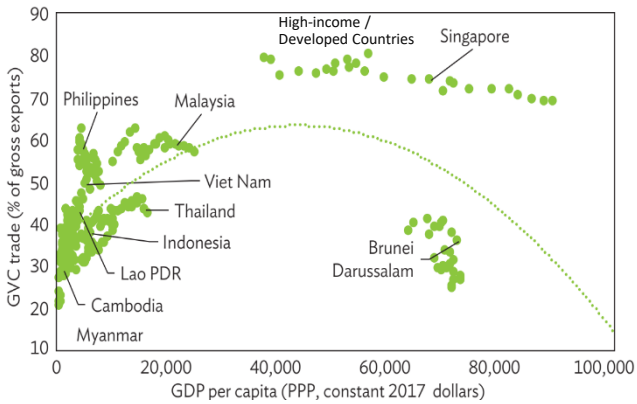
  - **Drones:** Development will focus on autonomous drones powered by emissions-free fuels. At present, the use of drones for the commercial delivery of goods is becoming more common in Japan, China and Europe.

  - **Synthetic biology:** Gene editing technologies are playing an ever-more important role in the future food industry, for example, to culture meat products from animal stem cells and to produce meat-like products from vegetable inputs. This will help to meet growing demand from health-conscious consumers, especially from elderly buyers who need to cut their intake of animal products.

  - **Carbon capture and storage: CCS** is one of the most important green technologies used by companies to meet their environmental, social, and governance (ESG) goals, and because of this, CCS technologies will help to usher in a new era of low-carbon industry. In particular, CCS is being used in heavy industry (e.g., by corporations in the petroleum, plastics, and cement industries), where the ability to capture carbon from waste gases before this is released to the atmosphere and then to store this safely underground is helping to cut emissions. Indeed, the stored gases can also be put to additional use, for example by being injected into oil wells to improve extraction rates. In Thailand, PTTEP has been researching CCS applications in the petroleum industry since 2021, and it is hoped that commercial use will begin in natural gas extraction by 2026.

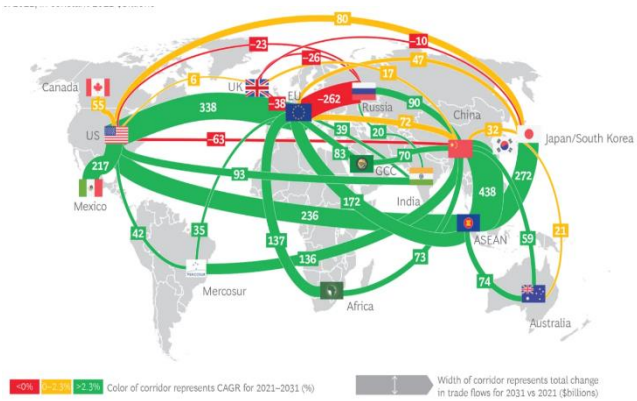
- **Decoupling between the major economies on the intensifying tech war will result in shortening global value chains.** The intense competition between the major economic powers, most obviously China and the US, for technological hegemony will continue to persist, and yet there are no signs of any let up in tensions. Indeed, as high-tech products such as smart electronics and EVs take on an ever more central role in adding value to global manufacturing, the importance of upstream advanced semiconductor production capacity is rising correspondingly. Governments have reacted to these intensifying pressures by attempting to build domestic capabilities while blocking competitors' access to core technological inputs, and this is then accelerating the economic divergence between the major powers. As a result, global manufacturing supply chains are tending to shorten, and increasingly these extend only to allies or across the home region. This stands in contrast to earlier trends in global sourcing patterns and the construction of global value chains (GVCs), which provide only limited benefits to the major economies. According to the 2023 report by the Asian Development Bank (ADB), participating in GVCs has a weaker impact on per capita GDP in high-income economies than in developing or recently industrialized countries (Figure 3). As a result of these trends, global trade is tending to become more concentrated in blocs allied with the major economic powers, such as the US with Europe, and China and Japan with the ASEAN region, while the value of trade between these advanced economies is stagnating or shrinking (Figure 4). **The shortening GVCs may happen in three ways:** ***(i) Re-shoring,*** or moving production facilities back to the home country (i.e., made-at-home production); ***(ii) Near-shoring,*** or building intra-regional supply chains; and ***(iii) Friend-shoring,*** or creating supply chains based on political or economic alliances. Shortening of supply chains under each of these three scenarios is forecast to result in decreases in global value chain participation of respectively -4.5%, -7.3% and -9.0% by 2035 against a baseline case involving no decoupling (Figure 5).

Figure 3 : Global Value Chain Participation has a Nonlinear Relationship with per Capita GDP, 1990–2015



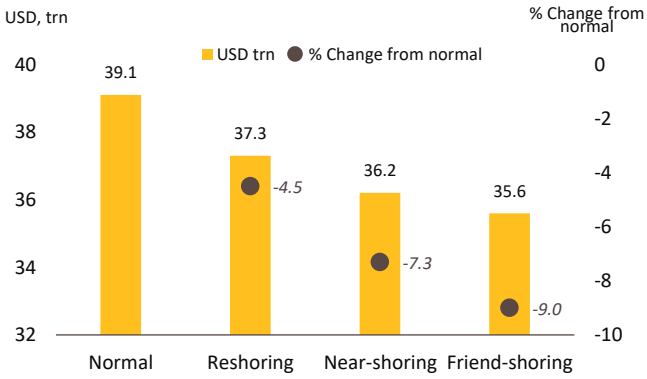
Source: Asian Development Bank (ADB), 2023

Figure 4: Changes of Trade Flow Impacted by Geopolitical Tension, 2031



Source: Boston Consulting Group (BCG), 2023

Figure 5: Global Value Chain Participation Forecast by Type of Geopolitical Intervention, 2035



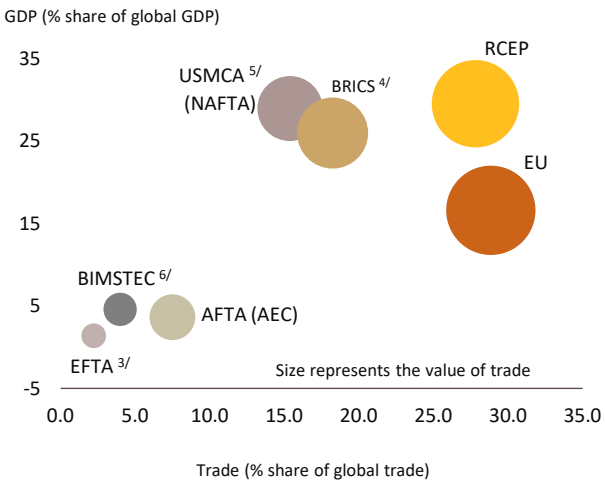
Source: ADB, 2023

- **Joining trade blocs and signing both bilateral and multilateral free trade agreements (FTAs) has helped to boost the competitiveness of Thai goods on world markets** (Figure 6), and to date, Thailand has agreed 14 FTAs with 18 countries[1/], the most recent of which was the Regional Comprehensive Economic Partnership (RCEP)[2/]. In 2022, trade with these countries accounted for 60.9% of all Thailand's exports, although over the first 9months of 2023, sluggishness in the world economy meant that exports under FTA rights contracted -3.3% relative to a year earlier. 82.9% of the total export value of items under FTA made use of the privileges arising from these, though as yet, the value of goods potentially under RCEP rights that benefit from the agreement is still relatively low (Figure 7). This is partly because at present, RECP import duties are still higher than under other FTAs, and so exporters tend to use the latter for selling into markets in RCEP member states, rather than the RCEP agreement itself. Nevertheless, duties covered by the RCEP agreement will steadily fall, and so in the coming period, use of these tax and import benefits will increase.

  Thailand is currently negotiating FTAs with three trade partners, the UAE (negotiations should be completed in 2023), Sri Lanka, and the European Free Trade Association[3/] (negotiations are expected to be finalized for these in 2024). Combined trade with these markets had a combined value of more than THB 540bn as of 2022, and agreeing FTAs with these would then bring the total share of Thai exports covered by FTAs to 66.7% (source: Department of Trade Negotiations). This would however remain far off the government's target of reaching 80% coverage by 2027.

  Thailand would also like to begin trade negotiations with a number of other partners, including the EU, Turkey, Pakistan, and the BRICS group[4/] (Thailand has applied to join the latter), which combined account for 26% of world trade and more than 40% of the global population. Signing agreements with these would provide a significant boost to Thai international trade, increase Thai competitiveness, and buffer Thailand's political and economic bargaining power. However, at the same time, this may also add to overheads for parts of the economy where companies need to raise their operating efficiencies, and some businesses may lose market share to more competitive players in other member countries.

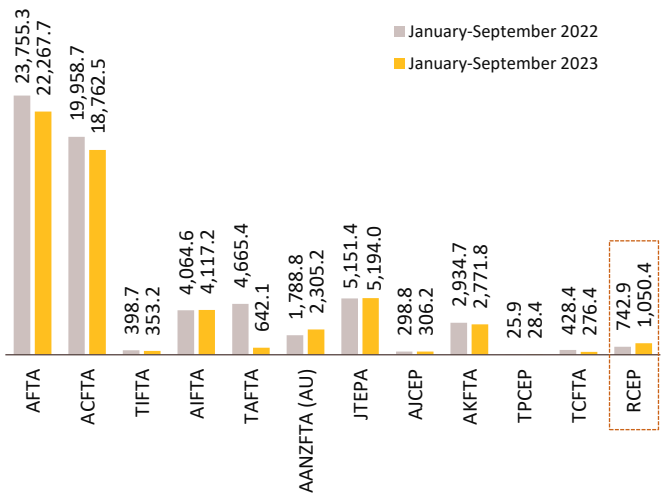
Figure 6 : The RCEP, the world's largest FTA, covering about 30% of both global GDP and global trade in 2022



Source: UNCTAD Stat, Krungsri Research

Figure 7: Export Value Under FTA of Thailand

(USD, m)



Source: Department of Foreign Trade (DFT)

1/ Currently, Thailand has agreed 14 FTAs with 18 countries: The ASEAN FTA (AFTA), the ASEAN-China (ACFTA), the Thai-India (TIFTA), the ASEAN-India (AIFTA), the Thai-Australia (TAFTA), the ASEAN-Australia-New Zealand (AANZFTA), the Thai-Japan (JTEPA), the ASEAN-Japan (AJCEP), the ASEAN-Korea (AKFTA), the Thai-Peru (TPCEP), the Thai-Chile (TCFTA), the Thai-New Zealand (TNZCEP), the ASEAN-Hong Kong (AHKFTA), and the Regional Comprehensive Economic Partnership (RCEP).

2/ The RCEP (Regional Comprehensive Economic Partnership) was agreed between 15 countries: Brunei, Cambodia, Lao PDR, Singapore, Thailand, Vietnam, Australia, China, Japan, New Zealand, South Korea, Malaysia, Myanmar, Indonesia, and the Philippines.

3/ The EFTA (European Free Trade Area) has 4 members: Iceland, Norway, Switzerland, and Lichtenstein.

4/ The BRICS countries are Brazil, Russia, India, China and South Africa.

5/ The USMCA (United States-Mexico-Canada Agreement) replaced NAFTA and was agreed between the US, Mexico, and Canada.

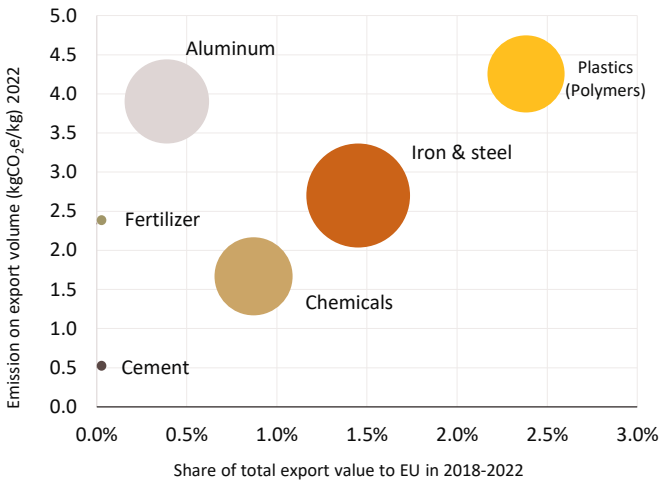
6/ BIMSTEC (Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation) is a framework providing for regional cooperation between South and Southeast Asia. The initiative has 7 members: Thailand, Myanmar, Sri Lanka, Bangladesh, India, Bhutan, and Nepal.

- **Driving ESG through international measures to combat environmental threats is becoming more stringent** as the world begins its transition to a low-carbon economy. While these moves will help Thai companies more rapidly shift their activities to a sustainable footing, they also pose what are potentially considerable challenges regarding adapting to a changing regulatory environment and then meeting the additional costs inherent in this. Most recent among these changes has been the implementation by the European Union of its Carbon Border Adjustment Mechanism (CBAM), which will collect additional carbon fees on imports to the bloc, and the EU Deforestation Regulation (EUDR), which requires importers of products to the EU to demonstrate that these are deforestation-free. These measures will thus have unavoidable consequences for the Thai agricultural and industrial sectors.

  For businesses, **the EU's CBAM** is the more significant of these since it came into force on October 1, 2023, and so henceforth, EU importers of products in the six categories of cement, electricity, fertilizer, iron and steel, aluminum, and hydrogen now need to report the carbon emissions associated with these when bringing goods into the EU. From 2026, enforcement will move from reporting to the collection of fees, and so importers will then need to pay a levy (in the form of a CBAM certificate) to compensate for their carbon emissions.

The CBAM thus constitutes a route through which indirect pressure is being brought to bear on Thai exporters. ***(i) Costs will rise*** due to the costs involved in measuring, reporting, and verifying emissions, as well as for paying carbon taxes and developing alternative low-carbon manufacturing processes. This will particularly affect the aluminum and the iron and steel industries since these are carbon-intensive products and a relatively high proportion of exports are to the EU (respectively 0.4% and 1.5% of all exports to the EU). The EU also plans to expand the reach of the CBAM to cover other industrial products, including plastics and chemicals; ***(ii) Prices for Thai exports to the EU will tend to rise***, and this will likely erode demand; and ***(iii) Thai exporters may lose market share*** to goods that can no longer be sold into the EU. In addition, other major trade partners, including the US, are also in the process of developing their own CBAMs.

Figure 8: Exports and Greenhouse Gas Emissions of CBAM Goods



Note: Bubble size represents exports to the EU as a percentage of exports to the World
Source: International Trade Centre, MOC, TGO, Krungsri Research

Going forward, we are likely to see the steady rollout of new measures that aim to lower greenhouse gas emissions, such as the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), which will come into force in 2027. **Thai businesses will therefore need to stay alert to the significance of these changes, and as growth in 'green business' accelerates, Thai players will need to stand ready to adjust their playbooks and to adapt to a rapidly evolving business environment.**

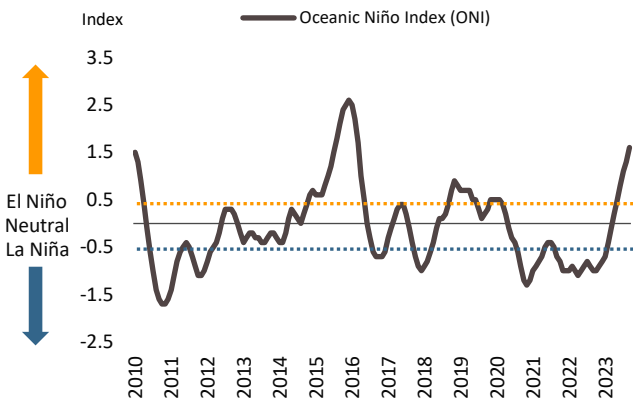
Table 1: Timeline of green regulations

Regulations	Affected sectors	2023	2024	2025	2026	2027	2030	2050 (carbon neutral)	2065 (net zero)
EU CBAM	cement, electricity, fertilizer, iron and steel, aluminum, and hydrogen	transition phase (measurement and reporting of emission)			full implementation (measurement, reporting, verification, and pay of emission on exports)				
EUDR	rubber, soy, cattle, palm oil, wood, cocoa, coffee, and some of their derived products	transition phase			full implementation (traceability of deforestation-free products)				
CCA (US CBAM)	fertilizer, hydrogen, cement, iron and steel, fossil fuels, refinery products, petrochemicals, adipic acid, glass products, paper and pulp, and ethanol	under review			tentative entry into force (pay of emission on exports)				
CORSIA	air transportation	pilot phase	voluntary carbon offsetting				mandatory carbon offsetting		

Source: European Commission, Department of Trade Negotiations (DTN), The International Civil Aviation Organization (ICAO), Krungsri Research

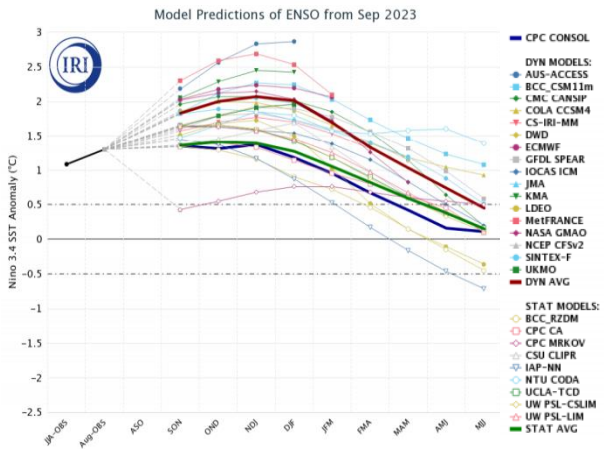
- **Drought will disrupt food supply chains, as El Niño conditions have officially been in effect since June 2023.** This is measured through the Oceanic Niño Index (ONI), which itself is determined by sea-surface temperatures in equatorial regions of the Pacific, with an ONI of greater than 0.5 indicating El Niño conditions and a value of less than -0.5 reflecting the emergence of a La Niña. As of September 2023, the ONI stood at 1.6 (Figure 9), which is classified as 'strong', though as shown by the average of dynamic models of the El Niño-Southern Oscillation (Figure 10), this will likely strengthen to 'very strong' by December. This latest El Niño is expected to last for 8-19 months, so it may run its course by Q1 of 2024 or may drag on until the end of 2024, in which case Thailand would likely be in drought until mid-2025 and the onset of that year's rainy season.

Figure 9 : Oceanic Indices



Source: National Oceanic and Atmospheric Administration (NOAA), Krungsri Research

Figure 10 : Model Predictions of ENSO



Source: NOAA, Krungsri Research

Krungsri Research sees this El Niño extending over the next 1-2 years, with impacts on the economy over 2023-2025 as described below. ***(i) Impacts on agricultural outputs and food security:*** drought will impact agricultural outputs and weaken food security, though because they are more sensitive to water shortages, rice, cassava, sugarcane, rubber, and oil palm will be particularly affected (Table 2). Declining outputs will trigger supply shortages in downstream industries, raising worries over a potential weakening of food security. This may lead to greater stockpiling of inputs, which would then drive up prices for agricultural products and other consumer goods. ***(ii) Impacts on manufacturing supply chain:*** with agricultural output declining, supply chains will weaken and demand from the agricultural sector for upstream goods and services (e.g., fertilizer, agricultural machinery, and agricultural services) will likewise soften. At the same time, downstream industries will have to contend with restricted access to inputs, and players will need to respond to this either by lowering their capacity utilization or by sourcing alternative inputs, both of which will add to unit production costs. ***(iii) Expected impacts of the drought on Thai GDP***: Krungsri Research estimates that rainfall will decline by between -10% and -15% over 2023 to 2025, and this will then cut GDP relative to the baseline case by -0.13% in 2023 and -0.3% in each of 2024 and 2025 (Table 3).

Table 2 : Expected Output Losses from the El Niño

% Output Losses by Major Products	In 2023	In 2024-2025 (per year)
Rice	**(-4)-(-5)%**	**(-2)-(-10)%**
Cassava	**(-0.5)-(-4)%**	**(-5)-(-13)%**
Sugarcane	**N.A.**	**(-5)-(-25)%**
Rubber	**0-(-0.5)%**	**0-(-2)%**
Oil Palm	**0-(-0.5)%**	**(-1)-(-6)%**

Source: NESDC's 2015 Input-Output Table, Office of Agricultural Economics (OAE), Krungsri Research

Table 3 : Projection of Economic Losses from Drought

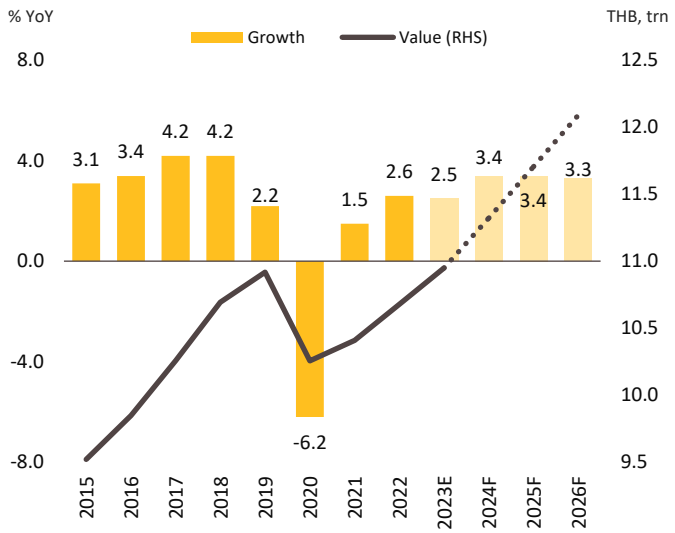
Scenario of Drought Risk	**Base Case Rainfall Drop 10-15%**	**Worst Case Rainfall Drop 15-20%**
Likelihood in 2024	High	Low
Likelihood in 2025	Medium	Low
Economic loss (BHT, m)	**50,174**	**77,837**
As percent of GDP	**0.29**	**0.45**

Source: Calculated by Krungsri Research

The Thai economy, 2024-2026: Average growth will be close to its long-term potential while the economy comes under pressure from internal and external headwinds.

The Thai economy is expected to expand by an average of 3.4% annually over 2024-2026, up from 2023's 2.5% (Figure 11) and close to the country's long-term potential, but below the 3.7% seen over the decade prior to the outbreak of COVID-19 (2010-2019). Growth will be supported by a number of factors. (i) Further recovery in the tourism sector should bring this back to its pre-pandemic state. Foreign arrivals are thus forecast to rise from 27.7 million in 2023 to 35.6 million in 2024 and 40 million in 2025, matching its pre-covid level in 2019. (ii) Private consumption will be lifted by the rebound in the tourism sector, strengthening labor markets, and government policy that aims to stimulate spending, especially in 2024. (iii) Investment will grow in domestic economic activities, new infrastructure, the development of the Eastern Economic Corridor (EEC), and expansion in 'green businesses' and the bio-circular-green (BCG) economy. However, Thai exports would still be pressured by continuing below-trend growth in overseas markets, while the outlook for some export sectors should be supported by specific factors, including possible upcycle of global Electronic and Electrical products, trends towards food security and regionalization. Meanwhile, the Bank of Thailand is expected to keep the policy rate at a 10-year high of 2.5% to help contain an uptrend of inflation to remain within the target range, support sustained economic recovery, and preserve policy space to cushion against possible risks in the future.

Figure 11: Thailand's Real GDP



Source: NESDC, Forecast by Krungsri Research

Although the outlook is for generally improving conditions over the next 3 years, a combination of internal and external headwinds will mean that Thailand will likely see slower growth than its regional peers. (i) Household debt has risen to worryingly high levels, and with interest rates also now elevated, spending and investment by low-income consumers and SMEs are under pressure. (ii) The impacts of the drought will likely worsen through 2024. (iii) Public debt will need to rise to pay for stimulus measures, and this may then have negative consequences for fiscal stability and the long-term sustainability of public-sector spending. (iv) The economy will continue to be affected by structural problems, including demographic changes (the birth rate is declining, Thailand is now an aged society, and labor shortages are a drag on industry) and the lack of competitiveness in some sectors. (v) External factors impacting Thailand will include the effects on external demand of high interest rates in major economies, China's real estate crisis and the impacts of this on the economy overall, decoupling between the US and China, and continuing geopolitical tensions, all of which will likely weaken demand in export markets and undercut investment in related industries. .

Infrastructure project acceleration will drive investment of related industries

Over 2024-2026, the government will expedite work on infrastructure megaprojects, including both new projects and ongoing work inherited from the previous government. In particular, the implementation of the Action Plan for Thailand's Logistics Development (2023-2027) will ensure that work on communication and logistics networks receives particular attention. To this end, the Ministry of Transport and Communications has earmarked THB 980 billion for work on 112 projects, 42 of which (38% of the total) involve improvements or changes to transportation modalities and the promotion of multimodal onward connections at a cost of THB 610 billion (62% of total expenditure). (i) Work on phases 1 and 2 of the double-track railway and the development of new sections of this network will be accelerated with the goal of transforming this into a primary transport modality linking industrial estates with border areas. Efforts will concentrate in particular on phase 2 of the project (from Khon Kaen to Nong Khai), which will connect to the Boten-Vientiane in Lao PDR (Vientiane high-speed China-Lao rail link runs from Kunming in China). Completion of these regional transport linkages will then provide a strong boost to exports and tourist exchanges between Thailand and neighboring countries. (ii) Ports and port hinterlands will be developed and utilized (e.g., phase 2 of the single rail transfer operator (SRTO) at Laem Chabang Port). This will then help to promote greater use of coastal and maritime transport services.

However, as a result of problems with compulsory land purchases and unresolved labor shortages dating back to the pandemic, work is running behind schedule on some of the megaprojects connected to the development of the Eastern Economic Corridor (EEC). Work on the high-speed rail link joining the area's 3 airports is now expected to begin only in 2024, while as of April 2023, phase 3 of the development of Laem Chabang Port was 40% behind schedule. More positively, phase 3 of the development of the Map Ta Phut Port is 60% complete (as of August 2023), and this is expected to be completed on schedule by 2027.

Acceleration of infrastructure development will support new investment opportunities, particularly in the targeted S-curve industries within the EEC. This will elevate Thailand's supply chain in technology-driven industries and encourage investment in related businesses, resulting from crowding-in effects, such as construction contractors, real estate, transportation, and logistics.

Table 4: Major Infrastructure Projects between 2023 to 2027*

Project	Project Timeline	Planned Budget (THB, mn)						Project Progress
		2023	2024	2025	2026	2027	Total	
1) Double Track, Phase 1								
- Lopburi - Pak Nam Pho	2018-2024	8,025	286				8,311	In progress
- Mab Kabao - Jira Junction	2018-2026	2,830	225				3,055	In progress
- Nakhon Pathom - Hua Hin	2018-2024	1,785					1,785	In progress
- Hua Hin - Prachuap Kiri Khan	2018-2024		560				560	In progress
- Prachuap Kiri Khan - Chumphon	2018-2024	1,715					1,715	In progress
2) Double Track, Phaes 2								
- Khon Kaen - Nong Khai	2023-2027	3	5,012	11,195	11,749	1,790	29,749	Not yet started
- Pak Nam Pho - Den Chai	2023-2027	6,064	5,879	14,181	21,756	13,792	61,672	Not yet started
- Den Chai - Chiang Mai	2023-2027	6	7,180	8,055	17,826	17,837	50,904	Not yet started
- Jira Junction - Ubon Ratchathani	2023-2027	3,749	4,745	14,093	12,939	1,998	37,524	Not yet started
- Chumphon - Surat Thani	2023-2027	6	3,466	6,371	9,917	4,527	24,287	Not yet started
- Surat Thani - Hat Yai - Song Khla	2023-2027	6	6,920	9,975	19,552	16,768	53,221	Not yet started
- Hat Yai - Padang Besar	2023-2028	5	895	2,165	2,908	685	6,658	Not yet started
3) High-speed Rail								
- High speed rail connecting three airports, Phase 1 (Don Mueang - Suvarnabhumi - U-Tapao)	2022-2028	424	413				837	In progress
- High-speed rail connecting regions, Phase 1 (Bangkok - Nakhon Ratchasima)	2018-2026	21,955	23,820	75,170	37,795		158,740	In progress
4) Laem Chabang Port, Phase 3 (Inpart of Port Authority of Thailand's investment)	2023-2027	10,174	6,678	4,198	4,325		25,375	In progress
5) National Highway Network	2023-2027	7,586	23,609	43,746	47,441	42,811	165,193	In progress
6) Enhancing Airport Capacity to Connect Transportation Networks	2023-2029	3,563	5,622	2,646	2,491	2,256	16,578	In progress

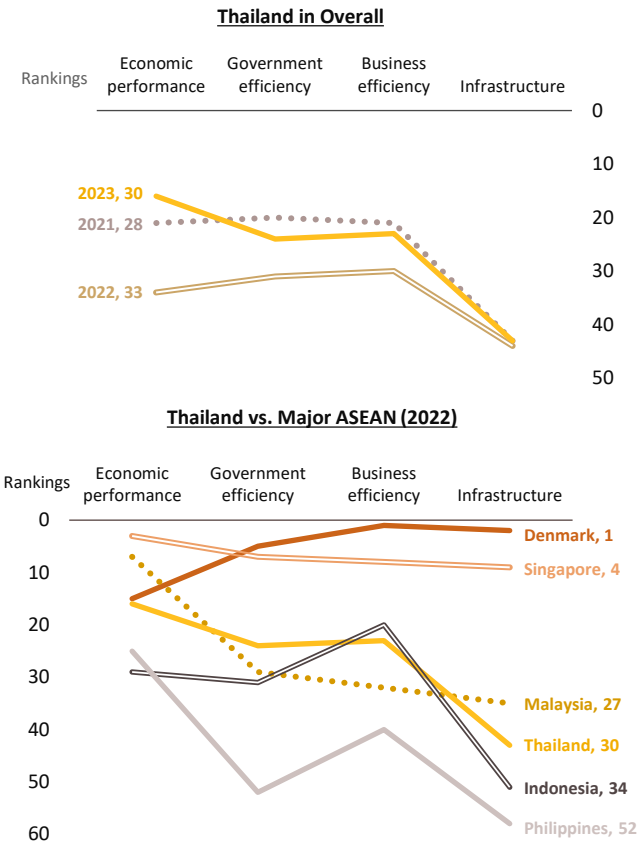
Source: Office of Transport and Traffic Policy and Planning , as of March 2023
Note: * Action Plan on Thailand Logistics Development 2023-2027, Ministry of Transport

The business environment

Structural problems are blunting Thailand's competitiveness

Thailand's competitiveness improved in 2023 relative to its level a year earlier, as measured by the IMD World Competitiveness Ranking of 64 countries, and overall, the country's position rose from 33 to 30 on across-the-board improvements. Under ***Economic Performance,*** Thailand jumped from 34th to 16th (Figure 12) thanks to improved scores for international investment, where FDI inflows surged 56% to more than THB 130 billion, and international trade (including services), where Thailand benefited from the reopening of the country to foreign arrivals and the resulting rapid rebound in the tourism sector. ***For Government Efficiency and Business Efficiency***, increases in the rankings were slightly less marked, with the country going from respectively 31st to 24th and 30th to 23rd. Improvements were recorded under institutional frameworks and business legislation, and in business productivity and efficiency, but ***in the infrastructure category***, Thailand edged up just a single place to 43rd. Here, Thailand's technological infrastructure improved, but in other areas, Thailand's performance remains poor, and low rankings continue to be seen in science (39th), health and the environment (53rd), and education (54th). In contrast, the highest-ranking countries of Denmark, Ireland, and Switzerland all have deep-rooted institutional frameworks and strong education systems, and so it is imperative that the country makes better progress in these areas. Thailand's competitiveness is also lagging behind some of its ASEAN peers, including Singapore (down to 4th from 3rd) and Malaysia (up from 32nd to 27th).

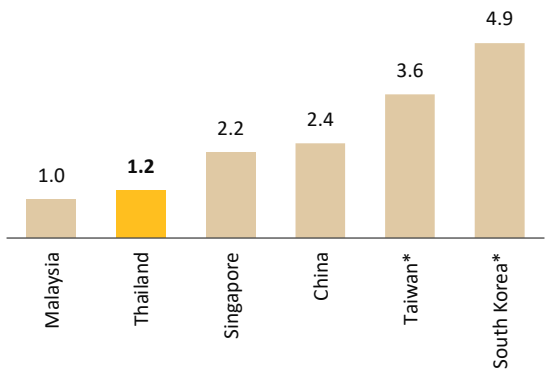
Figure 12: Ranking of Thailand's Competitiveness



Source: The World Competitiveness Ranking (2023), Institute for Management Development (IMD)

Going forward, investment in research and development (R&D) will have a major impact on sharpening national competitiveness. Unfortunately, data for 2021, the latest available, show that spending on R&D slipped to 1.2% of gross domestic product (GDP), down from 1.3% in 2020. Compared to many of Thailand's competitors, this is very low (Figure 13), and R&D spending remains far off the 2027 target of 2% of GDP. **To help address these problems, investment needs to be accelerated, especially in new industries such as electric vehicles and future food that are dependent on the development of new technologies. This would then help to drive increased spending on R&D,** which would in turn build Thailand's competitiveness over the long term and help to shore up the country's commercial and industrial base at a time when the outlook for the international environment is uncertain and subject to change.

Figure 13: Expenditure on R&D (% of GDP)



Source: IMD 2023 (World competitiveness ranking 2022), by country
The Office of National Higher Education Science Research and Innovation Policy Council (NXPO)
Note: * Data as of 2021 in South Korea and 2020 in Taiwan

The potential impacts on business of changes to the regulatory environment

Agriculture

- **The increase of the sugar price:** The Central Committee on the Price of Goods and Services (CCP) agreed to adjust some regulations related to the sugar industry. These came into effect on 15 November and consisted of the following; (1) sugar remains on the list of goods for which prices are controlled by the authorities, and (2) factory gate prices for sugar have been raised by THB 2/kilogram (prices for white sugar went from THB 19/kilogram to THB 21/kilogram, while for refined sugar, prices rose from THB 20/kilogram to THB 22/kilogram) for use to calculate the reference price for sugarcane for the 2023/2024 growing season, which starts in December 2023.

Real estate

- **The waiving of the requirement for visas for arrivals from China and Kazakhstan** between September 25, 2023, and February 29, 2024 will make travel to Thailand more convenient and more attractive for arrivals from these countries. With access to Thai property markets improving for Chinese buyers, **demand from both owner-occupiers and investors will receive a boost.**
- **The fees for registering property ownership and mortgages** have been reduced. i) The fee for registering transfers of ownership of a property has been cut from 2% to 1% of its value. ii) The charge for registering mortgages has been reduced from 1% to 0.01% of the property's value for both newly and previously built properties with a value of not more than THB 3 million. These reductions will run from January 3 to December 31, 2024, **to help stimulate property markets.**
- **Measures currently under consideration**
  - **Changes to the Condominium Act** are during the process of consideration to allow foreigners to own more than 49% of the saleable area in a condominium project, compared with currently up to 49% under the 2008 Condominium Act (4th Amendment). However, the foreigners will not have voting rights in the general meetings of the condominium juristic person. The changes are likely to be applied specifically to provinces with major tourist destinations and economically important areas.

Manufacturing

- **Duties are being waived on imports used in the assembly of battery-powered autos and boats.** These measures will run between March 7, 2023 – December 31, 2025, and will apply to battery, traction motors, EV compressors, battery management systems, drive control units, on-board chargers, DC/DC converters, inverters and PCU inverters, and reduction gears. It is hoped that **this will help to stimulate the domestic production of BEVs and so sharpen the competitiveness of Thai BEV manufacturing supply chains.**
- **As part of its Circular Economy Action Plan, the EU has revised its regulations governing the sale of batteries, and from July 1, 2024,** batteries sold in the EU that are used in EVs, laptops, tablets, smartphones, and industrial applications will need to accept standard chargers and to display their carbon footprint. **Thai battery manufacturers will thus need to adapt their products to meet the new EU rules if they are to maintain their customer base.**

- **The US is imposing punitive duties on imports of solar cells from Thailand, Malaysia, Vietnam, and Cambodia** following an investigation into circumvention of anti-dumping and countervailing duties slapped on Chinese exports. Chinese producers are now accused of avoiding these measures by relocating production facilities to these Southeast Asian nations, and so with effect from June 2024, duties of 16-254% will be put on Thai solar cells imported into the US (Thai exporters' most important market). According to Mordor Intelligence's forecast, the market value of solar energy in US will grow at an average of 16.5% CAGR, during 2023-2025, and so **this will cause Thai manufacturers to lose market share, most obviously to competitors from South Korea** (the 4th most important supplier to the US market) since these will be exempt from these additional duties. **Thai exporters dependent on the US market will thus need to prepare themselves for a challenging time since although policymakers are looking to build energy security** by increasing the supply of electricity from alternative sources, especially from solar, it is also possible that the US will issue additional measures to further cut dependency on Chinese solar product supply chains.

- **The anti-dumping committee has approved the imposition of anti-dumping measures on imports of hot-rolled and flat-rolled steel products** from Brazil, Iran and Turkey of respectively 34.4%, 7.3-38.3% and 6.9-38.2%, which will be levied on CIF (cost, insurance and freight) prices. These measures will be in place for 5 years, running from June 2023 to June 2028, though three categories of imports will be exempt: (i) imports for use or export from free trade zones as established in the law on the Industrial Estate Authority of Thailand; (ii) imports made by companies that have received investment support from the BOI for the purposes of import and export; and (iii) imports for use in exports as per the relevant customs law. **These measures will likely keep prices for imported steel elevated, and these increases may then be passed through into higher production costs, especially for auto manufacturers and manufacturers of electrical appliances.**

- **The Thai Industrial Standards Institute (TIS) has announced a further seven categories of electrical and electronic goods for which standards will be controlled,** with effect from 2024-2025. These are: (i) electrical skincare and haircare products; (ii) electric frying pans and deep fryers with a capacity of up to 5 liters; (iii) air conditioning units; (iv) hot- and cold-water dispensers; (v) domestic electrical switches; (vi) low voltage switching gear and components; and (vii) three-phase induction motors. **These measures will help to improve consumer safety and reduce the volume of substandard imported goods.**

- **The sugar tax due on non-alcoholic drinks is being raised to help increase consumer awareness of the dangers of excessive consumption of sweetened beverages.** The tax rate is calculated on the value of the product and its sugar content, though the rate has steadily been ratcheted up. To date, two rounds of increases have been completed (starting in 2017) and the third round of increases will run from April 1, 2023, to March 31, 2025. Following this, the fourth and final round of increases will run from April 1, 2025 onwards. **This will raise costs for manufacturers adding significant amounts of sugar to their products, and this may then be passed on to consumers in the form of higher prices.**

■ **Auto industry**

- **The Thai Industrial Standards Institute (TISI) has adjusted exhaust emission standards for trucks, buses, pickups, and eco cars to align these with the Euro 5 standards,** coming into force on January 1, 2024. It is hoped that this will reduce emissions of dangerous air pollution, including PM 2.5 particulates. **However, the need to develop parts that meet these new requirements will add to players' manufacturing overheads.**

- **Changes to excise duties on autos will help to reduce the release of greenhouse gases**

  - **The bands assigned to vehicles' according to the quantity of carbon dioxide (CO_2) that they release will be tightened**, with the total number of bands increased from 4 to 5. The new bands are CO_2 released < 100 grams/kilometer, 100-120 grams/kilometer, 121-150 grams/kilometer, 151-200 grams/kilometer, and > 200 grams/kilometer. These changes are part of a package to promote energy saving and a reduction in the release of CO_2

- **Excise duties for HEVs (hybrid electric vehicles) and PHEVs (plug-in hybrid electric vehicles) will be set according to their CO_2 emissions** as follows.
  - **Excise duties for HEVs with an engine capacity not greater than 3,000 cc** will be phased in over 3 periods: (1) From January 1, 2026, to December 31, 2027, rates will run from 6-24%, according to the vehicle's emissions; (2) From January 1, 2028, to December 31, 2029, rates will be at 8-26%; and (3) From January 1, 2030, onwards, rates will be 10-28%. **For HEVs with an engine capacity greater than 3,000 cc,** excise duty will be fixed at 40% from January 1, 2026.
  - **For PHEVs with an engine capacity no larger than 3,000 cc,** that can travel for at least 80 kilometers on a single charge, and that have a petrol tank that is no bigger than 45 liters, excise will be set at 5%, while for those that travel less than 80 kilometers per charge or that have a petrol tank larger than 45 liters, excise duties are set at 10%. All PHEVs with an engine bigger than 3,000 cc will face excise duties of 30%. This will be with effect from January 1, 2026.
- **Excise duties will be levied on traditional internal combustion engine (ICE) powered vehicles according to their CO_2 emissions.** These will rise in stages, beginning in 2026.
  - **For autos with an engine capacity of not more than 3,000 cc,** in phase 1 (January 1, 2026 - December 31, 2027) excise rates will be in the range of 13-34% as per vehicles' CO_2 emissions. Phase 2 will run from January 1, 2028, to December 31, 2029, when the rate will increase to 14-36%, and from January 1, 2030, onwards, excise duty will be set at 15-38%.
  - **For autos with engines larger than 3,000 cc,** excise rates will be fixed at 50% from 1 January, 2026, onwards. It is hoped that this will encourage the development of more environmentally friendly technology.
- **Excise duties on BEVs will be cut from 8% to 2%** to encourage their manufacture and use, as per the resolution of the national committee on EV policy, which has set a target of 30% of cars coming off Thai production lines being zero emission vehicles (ZEVs) by 2030.
- **To increase the competitiveness of Thai-made pickups and similar vehicles and to help Thailand maintain its position as a regional center of auto production,** the authorities are supporting the use of alternative energy other than biodiesel and promoting the production and use of BEVs and FCEVs (fuel cell electric vehicles). As part of this strategy, excise duties on these will be set at respectively 2% and 0%.
- **As with autos, excise duties for motorcycles, both ICE-powered and HEV and PHEV models, will be set according to their CO_2 emissions.** The first stage of the new regime will run from January 1, 2026, to December 31, 2029, with excise rates set at: 4% (CO_2 emissions < 50 g/km), 6% (CO_2 emissions 51-90 g/km), 10% (CO_2 emissions 91-130 g/km), and 20% (CO_2 emissions > 130 g/km). In phase 2 (from January 1, 2030, onwards), rates will be raised to respectively 5%, 10%, 15%, and 25%. To encourage greater domestic production and use of BEV motorcycles, excise on these will be fixed at just 1%.

- **To stimulate growth in the BEV segment,** the government recently approved the 2nd phase of the BEV stimulus package (EV 3.5 Package effective 2024-2027). This measure will give subsidies of THB 50,000-100,000 to individuals buying a BEV car costing up to THB 2 million, and of THB 5,000-10,000 to those buying a BEV motorcycle that costs no more than THB 150,000.
- **Vehicle tax is being cut for BEVs** registered between October 1, 2022, and September 30, 2025. Thus, to encourage the production and use of environmentally friendly vehicles while cutting emissions of CO_2 and PM2.5 particulates, vehicle tax on BEVs will be slashed by 80% for 1 year.

- **Petrochemical and plastic industry**
  - **Phase 2 of the action plan (2023-2027)** took a life cycle management approach, and so this sought to place the control of plastic waste on a long-term sustainable footing. This involves: (i) better **upstream management**, such as through better environmentally inspired design and the use of environmentally friendly production materials; (ii) better **midstream management** and the development of sustainable consumption, including encouraging purchases of environmentally friendly goods and products that can be reused or recycled, as well as reducing waste by cutting the use of packaging materials that have negative impacts on the environment; and (iii) better **downstream management** through the deployment of integrated solid waste management techniques, e.g., cutting the quantity of waste sent to landfill by separating out recyclable waste, encouraging waste-to-energy schemes, and composting organic waste. **The implementation of this measure will add to costs, and with global crude prices volatile and stiff competition, profitability will come under pressure.**

- **Energy and the environment**
  - **Plans to overhaul the energy sector and transition to a carbon-neutral economy will begin to come into effect in 2024.** This will consist of: (i) the 2022 Power Development Plan (PDP 2022); (ii) plans to manage gas supply; (iii) the Alternative Energy Development Plan (AEDP); (iv) the Energy Efficiency Plan (EEP); and (v) plans to manage oil supply. Overall, the goal is for Thailand to hit carbon neutrality by 2050 and net-zero GHG emissions by 2065, and so the authorities hope that **the implementation of these plans will accelerate investment in these areas by businesses active in electricity production, natural gas exploitation and importation, and oil refining.**
  - **Amendments to the Power Development Plan** (changes to the 2022-2037 plan should be completed in 2024) **and the 2018 Alternative Energy Development Plan** will, through the use of feed-in tariffs, increase the supply of electricity from private-sector alternative sources over 2022-2030. **In particular, investment and generating capacity will expand** in: (i) power sources for which inputs do not carry a cost, e.g., biogas, solar farms, and solar farms coupled with energy storage units; and (ii) industrial waste to energy schemes.
  - **The EU's new Carbon Border Adjustment Mechanism (CBAM)** entered its initial transitionary period on October 1, 2023. From this date, exporters to the EU of goods in six product categories (cement, electricity, fertilizer, iron and steel, aluminum, and hydrogen) will need to report the embedded emissions of these, though at this initial stage, verification will not be necessary, and no carbon fees will be levied. **However, full enforcement of the CBAM will begin on January 1, 2026, when exporters will need to begin reporting the carbon footprint of their products as verified by a licensed auditor. Exporters may also have to pay the price of their products' embedded emissions.** Thai exporters thus face the prospect of higher costs relating to carbon emissions, though this will particularly affect exporters of aluminum and iron and steel, since these are carbon-intensive products and a relatively high proportion of exports goes to the EU. **The net effect of this may then impact the competitiveness of Thai companies.**
  - **The EU's Deforestation Regulation (EUDR)** has established new laws requiring that importers and exporters of 7 products (rubber, oil palm, cattle, wood, coffee, cocoa, and soy, together with goods manufactured from these such as gloves and wooden furniture) will need to demonstrate that any products placed on or exported from the EU market are deforestation-free. These rules came into effect on June 29, 2023, but the EU postponed enforcement to December 30, 2024, for non-SMEs and to June 30, 2025, for SMEs. With the EU having an 11.5% share of exports in 2022, **rubber will be the most seriously affected Thai export, followed by wood and palm oil.**
  - **The US authorities are in the process of drafting the Clean Competition Act (CCA),** which will both establish a carbon pricing mechanism to be applied to US-based production and determine the operations of the US's own CBAM. These measures will apply to energy-intensive products including fertilizer, hydrogen, cement, iron and steel, fossil fuels, refinery products, petrochemicals, adipic acid, glass, paper and paper pulp, and ethanol. It is expected that the law will come into effect in 2026.

- **The International Civil Aviation Organization (ICAO) is introducing the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)** for all 193 member states, including Thailand, and this will require that these establish mechanisms for reducing carbon emissions. The latter will include developing new low-carbon technology, overhauling business practices, and making greater use of sustainable aviation fuel (SAF), but where emissions cannot be reduced, members will need to offset these against carbon credits. **The CORSIA measures will be enforced on a voluntary basis over 2024-2026, but from 2027 onwards, compliance with these will be compulsory.**
- **In Thailand, the authorities are drafting the Climate Change Act.** This is currently under revision, but its key provisions require that businesses report their carbon emissions and set targets for taking action. The law will also promote the establishment of a carbon market, thus **encouraging stakeholders at all levels to take concrete action towards lowering emissions and meeting the 2065 net zero target.** The Department of Climate Change and Environment (formerly the Department of Environmental Quality Promotion) will be responsible for enforcing the law.
- **The Bank of Thailand is working with public- and private-sector stakeholders to develop 'Thailand Taxonomy',** a classification of businesses according to their environmental impacts. This will then provide a framework for use by the financial sector to efficiently allocate sustainable finance. As of June 2023, the Thailand Taxonomy was completed for the energy and transportation sectors. Going forward, the work will be extended to include other parts of the economy, including manufacturing, agriculture, the provision of potable water, wastewater treatment, and water quality restoration, where its completion will help companies plan and execute business transformation more effectively. Alongside this, the financial sector will be able to use the taxonomy to guide the development of new financial products such as green bonds, green loans, green asset-backed securities, and green indices, **thereby boosting the credibility of Thai businesses on the global stage.**
- **The Department of Industrial Works is preparing to ban the use of dichlorodifluoromethane (HCFC-141b),** which is generally used in the manufacture of spray foam. The ban will come into force on January 1, 2024, and in place of this, manufacturers will need to use hydrofluoroolefins (HFOs), which do not damage the ozone layer. In addition to protecting the environment, the ban will also help to slow climate change and so this if forming part of Thailand's plan to reduce the release of greenhouse gases by -40% by 2040.

Services

Hotels

- **The government issued regulations specifying the characteristics and security systems of buildings used for hotel businesses B.E. 2566 (2023 AD), on August 30, 2023.** These regulations establish construction standards for building structures to ensure a safe environment for businesses providing accommodation services. This is aimed at reducing unauthorized modifications to buildings that have not met the standard for hotel services. These regulations may incur additional costs but will enhance confidence in safety for travelers.

Construction

- **Officials have revised the ministerial regulations on the standards governing the use of construction materials and so these have been brought close into line with current conditions and international standards.** These cover the materials used for interior and exterior coverings, roofing materials, windows, and gypsum panels. The new regulations will come into effect in March 2024, and their introduction will increase both the durability of structures and the safety of users. However, to meet these new standards, **manufacturers of construction materials will need to adapt their production processes and technology, while contractors will need to exercise greater care in matching materials to the type of structure being built.**

Retail and entertainment

- **New zoning rules have created a 'free trade zone' in the EECa, or Airport City, at U-Tapao Airport in Rayong, allowing for the 24-hour opening of entertainment centers that distribute alcoholic drinks**. In addition, businesses will benefit from the following: (i) Corporate Income Tax (CIT) will be waived for up to 15 years; (ii) foreign workers will be eligible for 10-year visas and work permits; and (iii) travelers and tourists will receive a 10-year waiver on excise and duties on duty-free purchases up to a total of THB 200,000 per person per year. These measures should stimulate greater investment in the EECa region, especially in restaurants, hotels, shopping centers, department stores, and duty-free shops, and encourage companies to put on meetings and trade shows in the area**. As the area around U-Tapao Airport develops a more comprehensive range of service offerings, the number of passengers passing through the airport will increase.**

- **Financial**
  - **On January 11, 2023, the Bank of Thailand (BOT) released a consultation paper on the regulations governing the licensing of virtual banks.** The first round of public consultation ran from January 12 to February 12, 2023, and once the results of this had been analyzed and incorporated into the proposed guidelines, a second round of public consultation was opened from June 19 to July 4, 2023. The results of this were then presented to the Ministry of Finance, and the key points of these proposals are that: (i) virtual banks should be locally incorporated in Thailand and should be restricted to offering financial services only through digital channels, but applications for an operating license should not be limited to companies in the financial sector, and entities with a background outside finance that meet the qualifying criteria should be permitted to operate as digital banks. (ii) Applicants should have a paid-in capital of at least THB 5 billion on the day of business commencement. (iii) As with other commercial banks, virtual banks should be required to make contributions to the Financial Institutions Development Fund (FIDF) and to the Deposit Protection Agency (DPA). After a minimum of 3 years of operations, the Bank of Thailand will evaluate applicants' potential to offer a full range of services, but the virtual bank will also be required to develop an 'exit plan' to be used should it need to cease operations. **Initially, the Bank of Thailand will propose no more than 3 companies for licensing as virtual banks to the Minister of Finance.**
  - **The Bank of Thailand issued a new suite of measures on July 21, 2023, to tackle the household debt problem as follows:**
    - **Responsible lending:** These measures aim to directly help debtors through 4 separate stages of the debt cycle: (i) prior to or during the process of signing a loan contract; (ii) being a debtor; (iii) having debt problems; and (iv) being filed a lawsuit or having debts sold off. These measures will come into effect on January 1, 2024.
    - **Persistent debt:** These policies provide for assistance from lenders for borrowers whose interest payments have exceeded repayments on the principal over the past 5 years. Specifically, lenders are required to provide help for borrowers with a monthly income less than THB 20,000 and who are repeatedly borrowing to cover personal expenses. Participants in the scheme will be able to restructure their debts, but they will also be required to cease taking on new revolving loans so that their overall level of indebtedness does not escalate further. The scheme will be rolled out on April 1, 2024.
    - **The BOT will allow the regulatory sandbox to begin for risk-based pricing (RBP) of interest rates and for defining debt service ratios (DSR).**
      - RBP measures: These aim to increase access to credit for borrowers with a high-risk profile from charged interest rates above the ceiling. At the same time, this scheme will allow low-risk borrowers or those with a favorable credit history to access credit at rates below the current level. Creditors will be able to begin testing RBP in the second quarter of 2024. This will include unsecured personal loans and nano finance.
      - DSR measures: These address macroprudential risk relating to new borrowings and specify that borrowers with an income less than THB 30,000/month should have a DSR no greater than 60%, while for those with an income greater than THB 30,000/month, the maximum DSR should be 70%. Initially, this will cover uncollateralized consumer loans (e.g., credit card and personal loans under supervision), but during the second phase of operations, the scope will be extended to include other types of credit, including home loans, remortgaging deals, auto and motorcycle hire purchase agreements, 'car for cash' loans, digital p-loans, and nano finance agreements. Enforcement of DSR measures should begin in 2025.

Krungsri Research sees the macroeconomic factors described above presenting both opportunities and challenges to businesses and industry, and companies will thus have to adapt rapidly to changing macroeconomic and social conditions. Players will also have to adjust to a regulatory framework that is evolving as the authorities look to build a robust foundation for businesses and create an environment conducive to long-term sustainable growth.

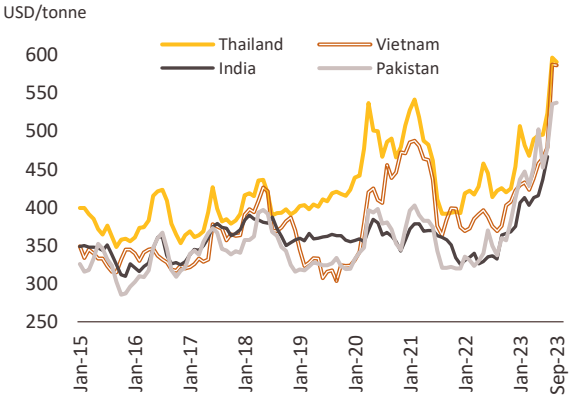
AGRICULTURE

Rice

Situation in 2023

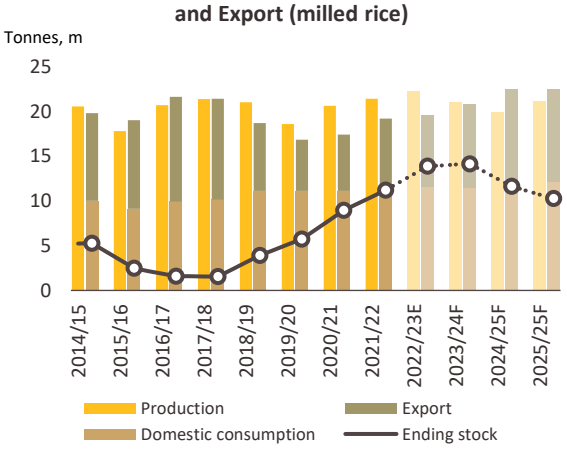
- **Production index of paddy climbed 6.4% YoY over 9M23**, lifted by: (i) favorable weather, sufficient access to irrigation water, and the fact that the impacts of the El Niño were limited by its start coinciding with the beginning of the rainy season; and (ii) rising prices and government support for farmers and rice markets. **Price index for paddy also surged 17.7% YoY** in the period thanks to: (i) the effect of the El Niño on global outputs, especially in the major exporting areas of India and Pakistan, while significant producing and consuming nations (e.g., China, Indonesia, and the Philippines) have seen outputs fall with the El Niño and so they have had to step up imports in response; (ii) demand for rice to buffer national food security that is rising in the face of economic uncertainty, the extension of the war in Ukraine and the increasing risk of natural disasters; (iii) following India's block on exports, the switch by importers to sourcing goods in Thailand*; (iv) domestic economic recovery, most notably in the restaurant, hotel, and food processing industries; and (v) stiff competition between middlemen and traders for supplies of rice to fulfil export orders. As such, prices for 25% white rice F.O.B. have risen 20.8% YoY, lifting export value by 23.0% YoY to USD 3.4bn. By volume, exports of milled rice were also up 12.3% YoY to 6.1m tonnes, and this then contributed to an average **27.2% YoY increase in income index for rice farmers.** However, elevated costs from high prices for energy, fertilizer and labor are dragging on profitability.
- Although some rice growing areas have been impacted by the El Niño-induced drought since mid-2023, this will be counterbalanced by the continuing effect of earlier positive factors, and so for 2023 overall, total **outputs of paddy are expected to rise by 4.0-4.5% to 34.3-34.5m tonnes, which will then produce 22.3-22.4m tonnes of milled rice. Exports are also forecast to grow by 3.0-4.0% to 7.9-8.0m tonnes of milled rice** due to: (i) worries over food security that will increase demand for rice for stockholding; (ii) the switch by importers to Thai suppliers following India's ban and the imposition of duties on exports of some rice*; and (iii) the return of economic life to normal in export markets. Domestic economic growth and the rising number of tourist arrivals will add to demand for rice coming from restaurants and industrial consumers, and so **distribution to the internal market should edge up 0.5-1.0% to 11.5-11.6m tonnes of milled rice.**

Figure 1: World White Rice 25% Prices (F.O.B.)



Source: Food and Agriculture Organization of the United Nations (FAO)
Note : Export prices for Indian rice, correct as of July 2023 (the latest data available).

Figure 2: Thailand Rice Production, Consumption and Export (milled rice)

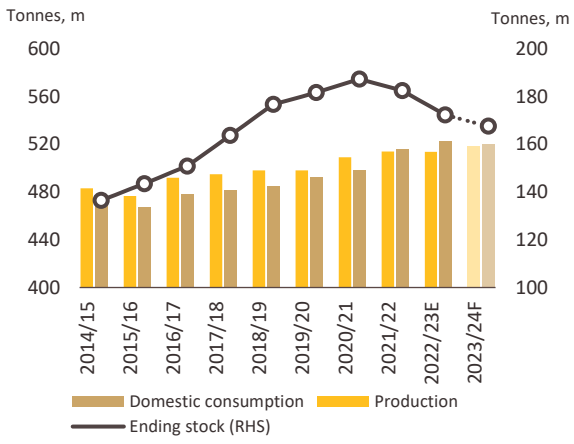


Source: OAE, DOA, MOC, Krungsri Research

2024-2026 Outlook

- **Outputs are expected to slip by between -1.5% and -2.0% annually to 30.7-32.5m tonnes of paddy, or 19.9-21.1m tonnes of milled rice.** This will be a consequence of: (i) the El Niño that emerged in mid-2023 and that is expected to persist for 1-2 years, bringing with it disruption to the rains and reduced access to water; and (ii) high prices for chemicals, energy, and fertilizer, which will encourage some farmers to use less of the latter, thereby hurting yields.
- **Domestic consumption will reach 11.5-12.2m tonnes of milled rice (up by an average 1.5-2.5% per year).** The market will benefit from the easing of the pandemic and the rebound in the tourism sector, which is supporting additional demand from restaurants, hotels, and downstream industrial consumers, especially food processors.
- **Exports will expand by an average of 8.0-9.0% annually to 9.3-10.5m tonnes of milled rice** on: (i) greater demand for stocks to preserve food security and to protect against likely worsening worldwide drought; and (ii) the impact of the El Niño on global rice outputs and the increasing switch by importers to buying from Thai suppliers.

Figure 3 : World Rice Balance



Source: USDA

* From 20 July, 2023, India banned exports of some types of rice, set a minimum export price of USD 1,200/tonne for exports of basmati rice, and began collecting export duties of 20% on overseas sales of parboiled rice, effective 20 July 2023.

Rubber

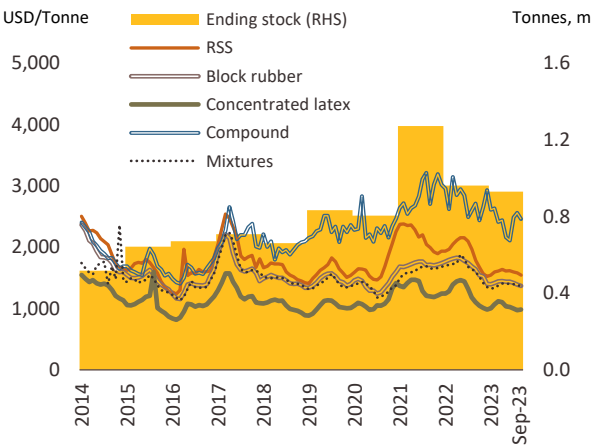
Situation in 2023

- **Production index of natural rubber slipped -1.5% YoY in 9M23, with MPIs for RSS, TSR and concentrated latex also down by respectively -32.3%, -1.3% and -25.4% YoY.** Production was affected by the El Niño and the hotter-than-usual weather, while falling rubber prices also disincentivized growers to maximize harvests. This was partly a result of the easing of the pandemic and the resulting slackening of demand for medical supplies, which then undercut overseas sales, and the fallback in crude prices. With global trade slowing, **exports volume contracted -10.5% YoY to 3.4m tonnes,** and declines were seen for RSS (-21.0% YoY to 0.3m tonnes), TSR (-14.6% YoY to 1.1m tonnes), concentrated latex (-32.6% YoY to 0.6m tonnes), and compound rubber (-3.8% YoY to 0.083m tonnes). Only mixed rubber products bucked the trend, and thanks to the ending of China's zero-Covid policy and the revival of the Chinese auto industry, exports grew 16.6% YoY to 1.3m tonnes. **Weak overseas demand undercut export prices to drop -18.7% YoY. Export value thus crashed -27.3% YoY to USD 4.6bn,** though **the domestic market expanded slightly** on growth in the production of autos and auto parts.
- **2023 output of intermediate rubber goods is expected to come to 5.1-5.2m tonnes (up 0.0-1.0%), but exports will contract by between -10.0% and -11.0% to 4.4-4.5m tonnes** on the sluggish performance of the main export markets of the US, Malaysia, Japan, India, and South Korea. Soft demand and falling crude prices will also cause **export prices to slip by -14.5% to -15.5%. Export income will thus slump by -23.0% to -25.0% to USD 6.1-6.2bn. However, the domestic sales volume should expand by 1.0-2.0%** thanks to government measures to stimulate domestic consumption, particularly in EV production.

2024-2026 Outlook

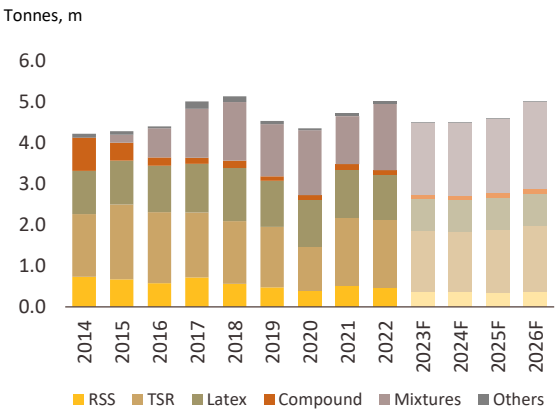
- **Rubber outputs will rise by 2.5-3.5% annually** on: (i) the age of rubber plantations, with many trees now in their period of maximum yields; (ii) the impact of the El Niño on declining rainfalls in the South, which will boost yields from rubber tapping; and (iii) government measures to balance the market and to support the industry.
- **Domestic distribution should expand by 3.0-4.0% (in terms of quantity)** on: (i) higher demand from downstream industries, especially from manufacturers of autos and auto parts (EVs will be especially important); and (ii) accelerating demand for use in public-sector construction. Likewise, export volume will rise by 3.5-4.5% per year on: (i) growth in the autos and auto parts industries; (ii) the switch by manufacturers of downstream rubber products to using natural rubber in place of more expensive artificial products; and (iii) the need to build inventories when faced with El Niño-driven uncertainty. The outlook for individual segments of the export volume is as follows.
  - **RSS: Exports will inch up by a maximum of 1.0% annually** because although Thai goods are produced to a high standard, they are losing market share to competition from the CLMV nations.
  - **TSR: Overseas sales will expand by 2.5-3.5% annually**, helped by growth in downstream industries, especially in the production of autos, auto parts, and tires.
  - **Concentrated latex: Exports will edge up by 0.5-1.5% pa**, boosted by the continuing demand for latex gloves and other medical supplies, although this has weakened with the easing of the pandemic.
  - **Compound rubber: Annual growth in exports should run to 2.5-3.5%** on gradual recovery of manufacturing sector in the major markets of India, the US, China, and the EU.
  - **Mixed rubber: This segment can look forward to annual growth of 6.0-7.0%.** This will be driven principally by expansion in the auto, auto parts, and tire industries, though mixed rubber has many applications, and as the Chinese economy grows (Thailand's major market), demand will rise.

Figure 1: Thailand Ending Stock and Rubber Export Prices



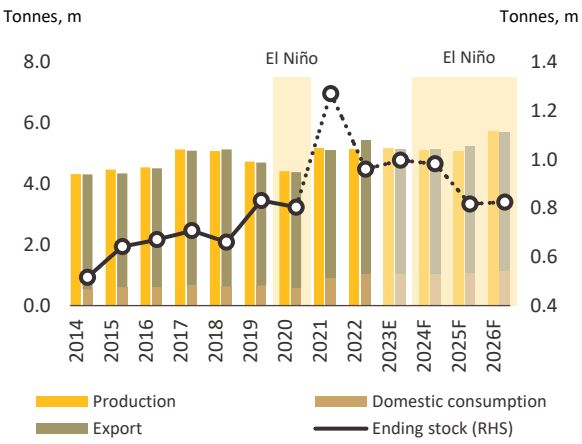
Source: DOA, OAE, DIT, World Bank, Krungsri Research

Figure 2: Thailand Rubber Exports (By Product)



Source: MOC, forecast by Krungsri Research

Figure 3: Thailand Rubber Production, Consumption, Export and Ending Stock



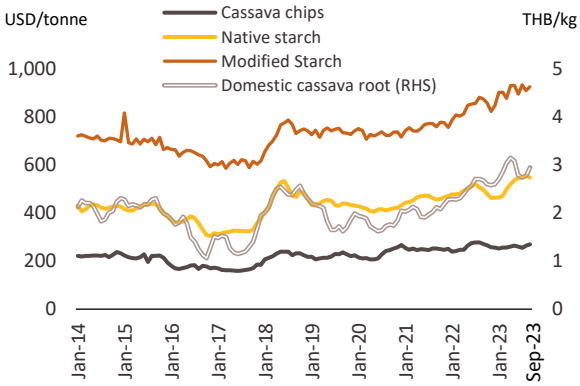
Source: OAE, DOA, MOC, forecast by Krungsri Research

Cassava

Situation in 2023

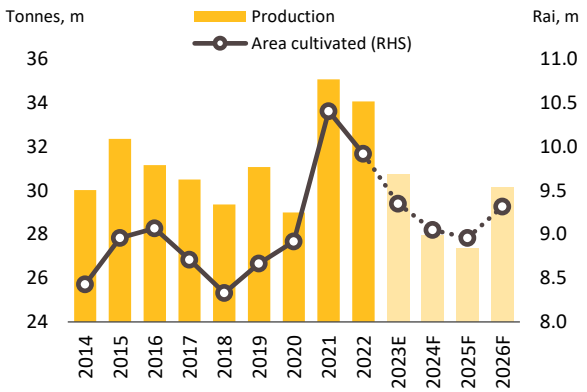
- **Production index of fresh cassava contracted -11.0% YoY over 9M23** on: (i) carry-over from natural disasters in 2022; (ii) farmers face a shortage of cassava stem for planting due to the high prices, leading them to shift to alternative crops, especially corn; and (iii) the spread of cassava mosaic disease, which reduced outputs and yield per unit. Given this, supply shortages dragged on the market and exports suffered.
  - **Export volume of cassava chips dropped -13.7% YoY** on shortfalls in the supply of inputs that then impacted sales into China, Thailand's main export target. This was despite strong demand for use as an animal feed, which rebounded with the easing of infections in bird flocks and swine herds. Demand from food processors also increased, and this then lifted export prices by 0.9% YoY.
  - **Export volume of native and modified starch slumped by respectively -27.5% YoY and -11.6% YoY** due to the widespread shortage of inputs, and this then meant that processing plant capacity utilization slipped from 54% to 44%. However, demand was again strong, most notably in China, and so export prices rose 9.0% YoY.
- For the remainder of 2023, although both domestic and international demand will remain strong, the reduction of plantation area due to the shortage of cassava stem for planting, the spread of cassava mosaic disease, and losses from drought will mean that **2023 outputs of fresh cassava will fall by between -9.0% and -11.0% to 30-31m tonnes,** having already contracted -2.9% in 2022. Distribution of the **domestic market volumes should expand by 2.0-4.0%** thanks to the return of economic life to normal (especially for restaurants), the rebound in tourist arrivals, and greater demand for ethanol as domestic travel increases. However, due to a combination of high prices and a shortage of inputs, **overseas buyers will tend to switch to alternative crops and starches and so export volume will fall by -12.5% to -13.5% for cassava chips, -25.0% to -26.0% for native starch, and -11.0 to -12.0% for modified starch.** Nevertheless, exports of cassava pellets will jump by 22.0-23.0% on greater demand for use in the production of animal feed.

Figure 1: Cassava Prices



Source: Tapiocathai, Krungsri Research

Figure 2: Thailand Cassava Root Production

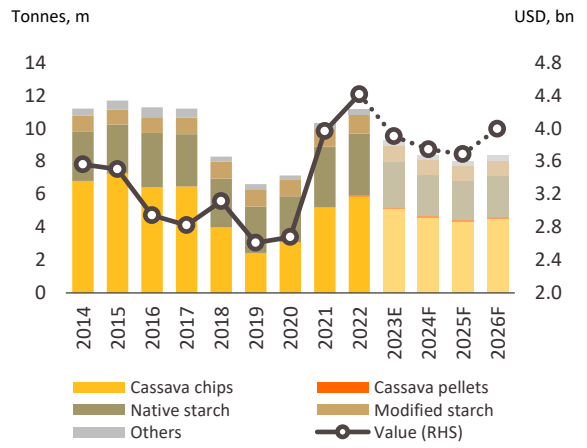


Source: OAE, forecast by Krungsri Research

2024-2026 Outlook

- **Outputs of fresh cassava are expected to contract by between -1.0 and -2.0% annually** as the effects of the El Niño on access to water worsen over 2024 and 2025 and outbreaks of cassava mosaic disease continue to occur. However, **volumes of domestic consumption of cassava product should increase by 3.0-5.0% per year** on: (i) the boost given to food processors by general economic growth; and (ii) stronger demand for ethanol as the domestic transport and tourism sectors strengthen and spending on infrastructure increases. On the other hand, although demand from Chinese manufacturers of pharmaceuticals, cosmetics, food, paper, sweeteners, and textiles will increase, **annual export volumes will slip by an average of -3.0% to -4.0%** because the impacts of drought, disease, and the switch by farmers to growing other crops will extend supply shortage problem. This will cause business to face difficulties due to a shortage of raw materials for production to deliver to trading partners. In addition, prices for cassava products will track the higher price of inputs, and so buyers in export markets will tend to switch to alternative products. Given this, annual export volumes are expected to fall by **-3.0% to -4.0% for cassava chip (to 4.3-4.5m tonnes), by -10.0% to -11.0% for cassava pellets (to 0.07-0.08m tonnes), by -3.0% to -4.0% for native starch (to 2.4-2.5m tonnes), and by -2.5% to -3.5% for modified starch (to 0.8-0.9m tonnes).**

Figure 3: Thailand Cassava Product Exports



Source: MOC, forecast by Krungsri Research

Sugar and molasses

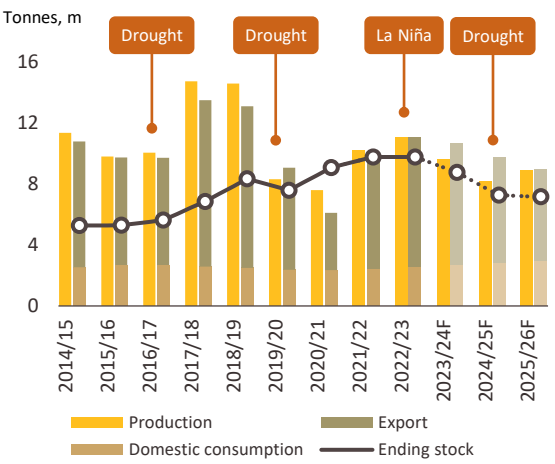
Situation in 2023

- **The quantity of sugarcane being pressed during the 2022/23 season rose 2.0% to 93.9m tonnes,** and this then produced 11.1m tonnes of sugar (+8.9%). Growth was supported by: (i) favorable weather and access to irrigation water during the growing season; and (ii) a high minimum price for sales to sugar mills and the rising prices set on global markets, which then encouraged growers to expand the area under cultivation. However, although high prices incentivized farmers to continue with the widespread planting of sugarcane, the emergence of the El Niño and the resulting decline in rainfall and increase in drought conditions means that for the 2023/24 growing season, the quantity of sugarcane being pressed is expected to decline by -7.5% to -8.5%, which will then produce 10.1-10.2 million tonnes of sugar. In addition, the expenses incurred for power, fertilizer, pesticides and labor for harvesting (especially for fresh sugarcane) remain elevated and this is putting downward pressure on farmer's profits.
- **9M23 exports of sugar and molasses rose 3.6% YoY to 6.0m tonnes,** split between 3.6m tonnes of raw sugar (+4.5% YoY), 2.3 million tonnes of granulated sugar (+2.4% YoY), and 0.14m tonnes of molasses (+0.2% YoY). Exports were lifted by: (i) growth in global demand for sugar (up 1.0-2.0% annually), now that the pandemic is easing and economic life has returned to normal; (ii) fears over the impacts of the El Niño on food security; and (iii) the easing of supply shortages, which has allowed exports to rise. Export prices climbed by 8.4% YoY, and so export value is up 12.3% YoY to USD 3.1bn.
- **For all of 2023, export volume should rise by 18.0-22.0%.** Sales into overseas markets will benefit from strong demand in downstream industries and rising worries over food security, especially following India's decision to reduce or halt exports of sugar in October 2023. As a result of Thailand's reopening and the return to normal service for businesses, and in particular for restaurants, **domestic demand should also increase 6.0-7.0% this year, or to 2.60-2.62m tonnes.**

2024-2026 Outlook

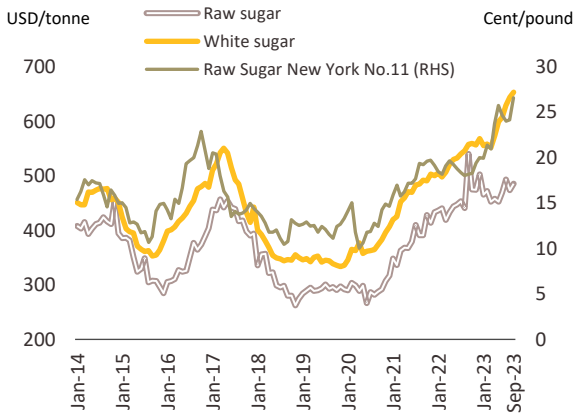
- **Outputs will tend to decline** as a result of: (i) the intensification of the El Niño, which will lead to drier weather and reduced access to irrigation water; and (ii) continuing high production costs. As a result, some farmers will switch to growing alternative crops (e.g., cassava and corn), though ongoing supply shortages will lift global prices for sugar and so some farmers will in fact expand the area under cultivation as they look to meet demand from sugar mills. **Average outputs should thus fall to 75-85m tonnes of sugarcane, which will then produce 8.2-9.6m tonnes of sugar annually (a fall of -6.5% to -7.5%).**
- **Exports of sugar and molasses will drop by between -10.0% and -11.0% to 6.0-8.0m tonnes annually.** Overseas sales will slow under the impact of: (i) restricted access to sugarcane for pressing; and (ii) reserves of supply to serve rising domestic consumption following domestic economic recovery. However, Thai players will benefit from the decision by the Brazilian and Indian governments to promote the domestic consumption of ethanol, thus reducing sugar exports to world markets coming from these major producers. **Domestic consumption is forecast to rise by 3.5-4.5% per year to 2.7-2.9m tonnes** thanks to an uptick in economic activity and the rebound in the tourism sector, which will then spur additional demand from downstream industrial consumers. Nevertheless, the increase in the sugar tax on beverages will restrict growth in domestic demand.

Figure 1: Thailand Sugar Balance



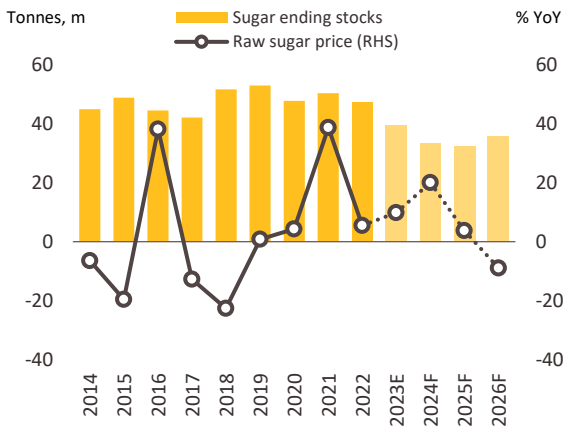
Source: USDA, OAE, MOC, compiled and forecast by Krungsri Research

Figure 2: Thai Sugar Export Prices & Raw Sugar New York No.11 Prices



Source: Ministry of Commerce (MOC), compiled by Krungsri Research

Figure 3: Global Sugar Flow



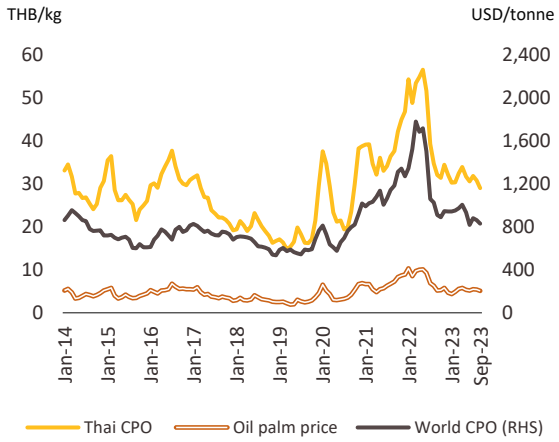
Source: World Bank, USDA, OAE, Krungsri Research

Oil Palm

Situation in 2023

- **Over 9M23, outputs of oil palm used to produce crude palm oil edged up 2.9% YoY to 14.1m tonnes** thanks to: (i) sufficient rainfall in 1H23 and favorable weather, most notably in the South; and (ii) high prices that incentivized growers to maximize their harvest. **Output of crude palm oil (CPO) thus rose 5.2% YoY to 2.6m tonnes, while the domestic sales of CPO is growing rapidly at 18.5% YoY (to 1.9m tonnes).** This has led to an increase in the production of refined palm oil, reaching 1.1m tonnes (+20.2% YoY), as a result of the country reopening and the tourism industry rebounding, demand from restaurants, hotels and nightspots has strengthened. The market also benefited from greater demand for diesel from the transport sector and the decision to increase the standard diesel mix from B5 to B7 from October 2022 onwards, and this then lifted sales of biodiesel (B100) by 16.1% YoY to 0.8m tonnes. However, **the price of Thai CPO is more expensive than average price in global markets and so exports contracted -0.7% YoY to 0.71m** tonnes as buyers in major overseas markets (e.g., India and Malaysia) switched to alternative vegetable oils somewhat.
- Although the El Niño will undercut outputs through the rest of 2023, better weather in 1H23 and the ongoing effect of high prices will boost **2023 outputs of oil palm used to make CPO by 0.5-1.5%, or to 19.1-19.3m tonnes, and this will then be converted into 3.4-3.5m tonnes of crude palm oil (+0.5-3.5%).** Strong demand from the food processing, oleochemical, and transport industries will accelerate **domestic sales of CPO by 20.0-23.0% (in terms of quantity)**, but softening markets in India and Malaysia will contribute to a **-14.0% to -16.0% slump in exports.** Year-end stocks of CPO are thus expected to run to 0.31-0.33m tonnes, but because this is above the target range of 0.20-0.25m tonnes, this will put downward pressure on prices. **Prices for fresh palm fruits will thus average THB 4.8-5.2/kg, down from THB 7.7/kg a year earlier, while domestic prices for CPO and export prices for palm oil products will slip by between -27.0% and -36.0% and by between -28.0% and -32.0% respectively.**

Figure 1: Crude Palm Oil (CPO) Prices



Source: DIT, OAE

Table 1: Thai Palm Oil Key Indicators

Tonnes, k

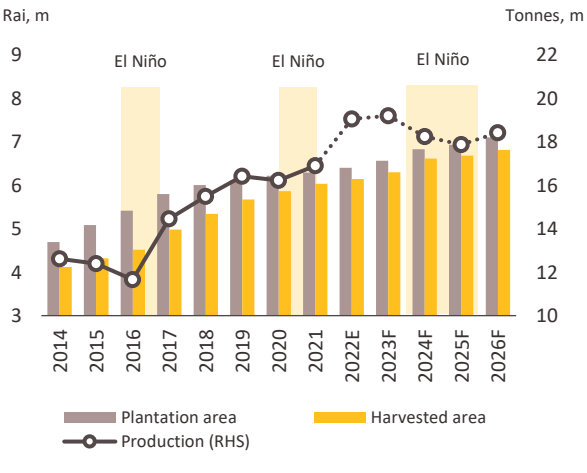
	2019	2020	2021	2022	2023E
Production	3,034	2,652	2,963	3,376	3,467
Imports	4	3	1	1	0
Domestic con.	2,800	2,529	2,382	2,170	2,622
- Refined oil	1,463	1,165	1,235	1,251	1,525
- Bio diesel	1,337	1,364	1,146	919	1,097
Exports	296	236	619	1,031	869
Ending stock	319	209	173	348	324

Source: DIT, estimated by Krungsri Research
Note: Forecast by Krungsri Research

2024-2026 Outlook

- **Output of fresh palm fruit and CPO will likely trend downwards by between -1.0% and -2.0% annually** as the effects of the El Niño intensifies through 2024 and 2025 and per-unit yields suffer, though continuing high prices will encourage some growers to replant rubber stands with palm and this will partly offset the negative impacts of unfavorable weather. **Ongoing domestic economic growth will strengthen demand for CPO from downstream consumers, especially the food processing, oleochemicals, and transport industries, and as such, this will expand by 3.0-5.0% per year** (in terms of quantity). Nevertheless, declining supply and the diversion of this to the domestic market will mean that **export volume will crash by -20.0% to -25.0% annually.**
  - **Growers: Income should strengthen** on rising domestic demand and government help for the industry that will keep profits positive. However, farmers will be exposed to risk arising from the threat of drought and the impact of this on yields, global prices that will fluctuate with world demand, and the rising cost of fertilizer.
  - **Crude palm oil mills: Turnover will tend to improve** thanks to the increasing number of tourist arrivals, growth in commercial transport, and government measures that will boost consumption of biodiesel. Nevertheless, the market is affected by an oversupply of production capacity and by stiff competition for access to inputs, which is then adding to CPO production costs. This may put pressure on profits and some players may have to shoulder stock losses.

Figure 2: Thai Oil Palm Plantation and Production



Source: OAE, forecast by Krungsri Research

Chilled, Frozen and Processed Chicken

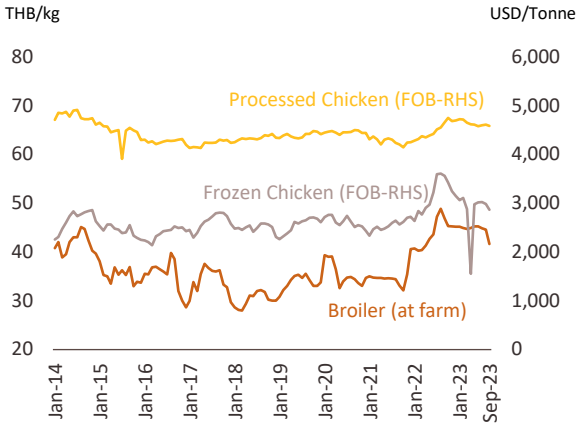
Situation in 2023

- **Production of chilled, frozen, and processed chicken expanded 10.8% YoY to 2.4m tonnes across 9M23** as a result of: (i) stronger demand on domestic and international markets; and (ii) an average increase in selling prices at 44.6 Baht per kilogram (+2.4% YoY) that motivated production expansion. **Domestic distribution volume expanded 10.2% YoY,** helped by the rebound in the tourism sector, growth in the economy, and recovering purchasing power that then fed through into higher demand from restaurants and the food processing industry. At the same time, **exports volume expanded 6.2% YoY** thanks to: (i) increased demand in the major markets of China and Japan following their reopening; (ii) the easing of restrictions on imports into China and the waiving of import tariffs on chicken products by South Korea through to the end of 2023; and (iii) outbreaks of bird flu in poultry in important importing nations (e.g., Japan and the EU) that cut yields and diverted demand to Thailand.
- These factors will continue to support strong demand in domestic and overseas as the year closes, though their impact on output will be partly offset by the high cost of animal feed and the easing of bird flu outbreaks in important export markets. **For all of 2023, industry output should therefore rise by 5.0-7.0% on increases of respectively 6.0-8.0% and 4.0-5.0% in the quantity of goods distributed to domestic and overseas markets.**

2024-2026 Outlook

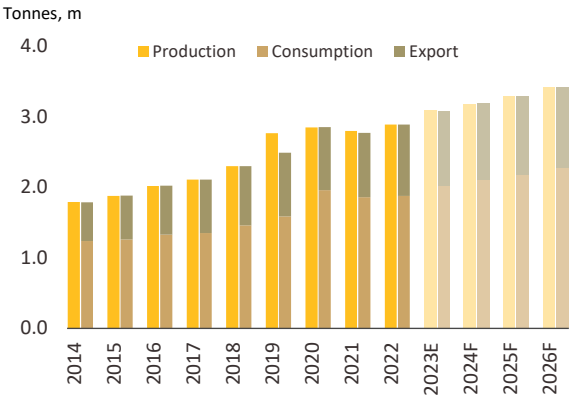
- **Total output of chicken products will expand 3.0-4.0% annually** over the next 3 years to around 3.2-3.4m tonnes/year as producers move to meet ongoing growth in domestic demand and export markets. **Domestic distribution is forecast to rise by 3.5-4.5% per year,** helped by the positive outlook for the economy, and in particular by growth in the tourism, hotel, and restaurant industries, as well as by increasing consumer concern with personal health that is encouraging a switch to low-fat chicken products. **The annual expansion in overseas sales will expand 2.0-3.0%,** though growth will continue to be supported by: (i) strengthening consumer purchasing power; (ii) chicken's low price relative to other meats; and (iii) Thailand's improving trade relations with the Middle East, in particular with Saudi Arabia, where Thai producers' adherence to halal standards is increasingly recognized.
- **Headwinds challenging the industry will include:** (i) thanks to advances with vaccinations and closed housing systems, the likely easing of bird flu outbreaks in export markets, thus reducing the need to buy from Thai suppliers and/or allowing buyers to source from elsewhere; (ii) the rising cost of animal feed, while strong supply will put downward pressure on prices; (iii) a broadening range of alternatives now that pork and beef prices are falling, resulting from respectively the clearing of ASF infections and the signing of the ASEAN-Australia-New Zealand FTA; and (iv) rising non-tariff barriers to trade, especially as a result of ESG-related concerns connected to animal welfare.

Figure 1: Domestic Broiler Prices and Thai Chicken Export Prices



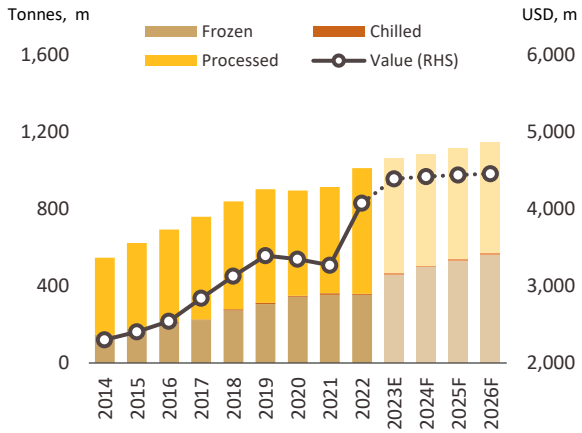
Source: OAE, MOC

Figure 2: Thai Chicken Industry Forecast



Source : OAE, Forecast by Krungsri Research

Figure 3: Thailand's Chicken Product Exports Forecast by Product



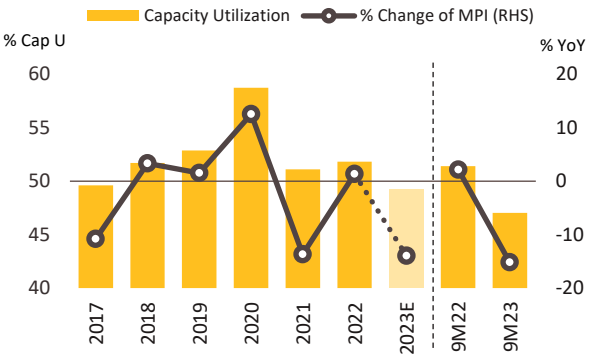
Source: MOC, Forecast by Krungsri Research

Canned Fish

Situation in 2023

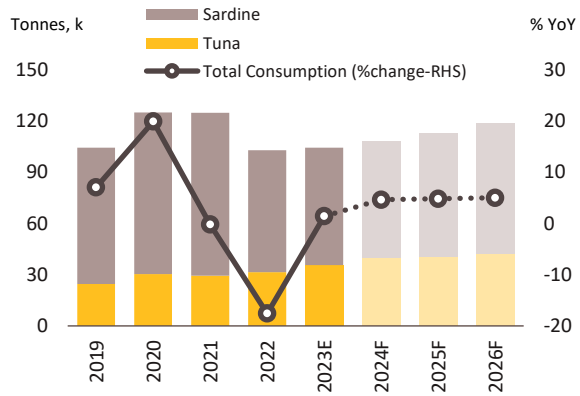
- **Output slipped -15.2% YoY in 9M23,** split between declines of -17.7% YoY for canned tuna and -4.6% YoY for canned sardines. Weaker conditions were a result of falling yields, which were themselves a consequence of higher ocean temperatures, and this added to the cost of inputs. Tuna prices therefore climbed 12.9% YoY, while the cost of sardines was up 3.8% YoY. **Domestic consumption volume of canned seafood edged up 1.2% YoY over the first 9 months of the year.** In detail, sales volume of canned tuna jumped 37.8% YoY on the release of new product lines and stronger demand for healthier foods, especially among mid- to upper-income shoppers. However, the easing of the pandemic and reducing need to store food at home meant that consumers could eat out instead, and so sales volume of canned sardines fell -12.9% YoY. In the period, **exports volume also suffered, dropping -15.4% YoY** to 343.5m tonnes, with income from this down -10.2% YoY to USD 1.5bn. (i) Receipts from the sale of canned tuna contracted -16.8% YoY on higher production costs that then lifted export prices by 7.4% YoY to USD 4,649/tonne. Exports thus fell -16.6% YoY to the US, -20.1% YoY to Australia, and -77.2% YoY to Egypt. (ii) Export prices for canned sardines also edged up, rising 1.1% YoY to USD 2,626/tonne and thereby pulling down exports by -3.6% YoY, with declines of respectively -13.1% YoY and -8.9% YoY seen in the important markets of South Africa and the US.
- These factors will affect the market through the remainder of the year, and so **2023 production is expected to drop by between -12.0% and -14.0%.** For producers of canned tuna, the emergence of an El Niño will continue to raise water temperatures and undercut the size of the catch, while for manufacturers of canned sardines, demand for food to stock at home has crashed, including the inventory level that remains high. **Given this, domestic consumption volume will edge up by just 1.0-2.0%,** helped by the development of new product lines that aim to meet the needs of both consumers looking for easy-to-prepare foods and those shopping for healthier products. Exports volume will continue to be squeezed by weak purchasing power in important markets and the switch by some consumers to fresh foods, and so **overseas sales will shrink by between -14.0% and -16.0%.**

Figure 1: MPI and Capacity Utilization of Canned Fish Industry



Source: OIE, Forecast by Krungsri Research

Figure 2: Thailand's Canned Fish Domestic Consumption

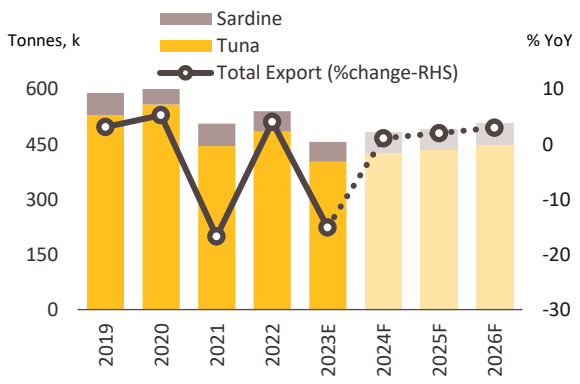


Source: OIE, Forecast by Krungsri Research

2024-2026 Outlook

- **Over the next 3 years, the domestic production of canned fish is expected to remain stable or increase by up to 1.0%** annually. Growth will be constrained by the El Niño and the resulting warmer oceans, which will continue to limit the size of the catch, as well as by the high cost of imports, especially of tuna. However, **annual growth in domestic consumption will run to 4.0-6.0%** as the economy expands and spending power recovers, though demand will be especially strong from urban consumers looking for foods that are easy to prepare. **Overseas sales will rise, strengthening by 1.0-3.0% per year** as economies in export markets expand, but the effects of this will be limited by: (i) weaker demand now that the pandemic has passed and the need to stock food at home has receded; (ii) the signing of an FTA between China and Ecuador, one of Thailand's competitors, which will now face lower costs when exporting into China; and (iii) the possible impacts of a Middle East war on the cost of packaging and fuel, which would add to overall business overheads.

Figure 3: Thai Canned Fish Exports



Source: MOC, Forecast by Krungsri Research

FOOD & BEVERAGES

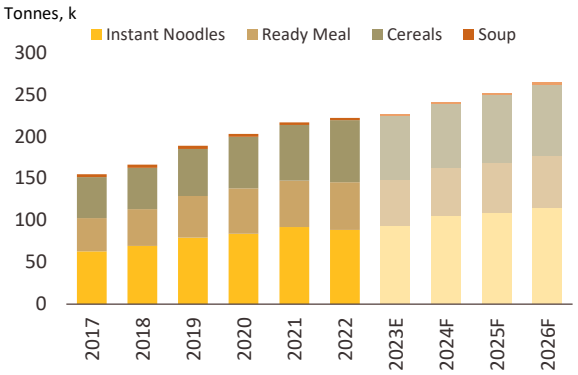
Ready-to-eat food

Situation in 2023

Domestic distribution will contract by between -1.0% and -2.0% by quantity in 2023 following the ending of the pandemic and with this, the decline in the need to store food at home and the return of diners to normal eat-in service in restaurants. **Exports will edge up 1.5-2.0%** because although competition is stiff and the cost of inputs has risen, players continue to benefit from: (i) confidence in the quality of Thai products and the popularity of their flavors; and (ii) worries over food security resulting from geopolitical tensions and possible declines in agricultural outputs.

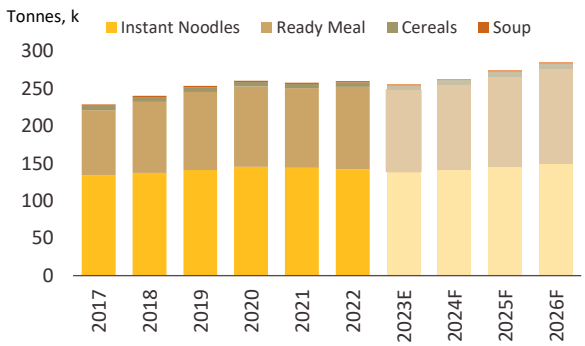
- **Instant noodles: The quantity of domestic distribution is expected to be down by -1.5% to -2.5% in 2023** (following a decline of -1.3% in 2022). Costs have risen but because prices are controlled by the government, manufacturers have responded by shifting their focus from domestic to overseas markets. Having slipped -3.6% in 2022, **2023 exports will thus climb by 6.0-7.0%,** helped by the popularity of Thai products' flavors as well as their low cost.
- **Ready-to-eat meals: The quantity of domestic distribution is forecast to slip by -1.0% to -2.0%** (this grew 3.6% in 2022) thanks to the return of consumers to eating out as normal and growth in the range of food delivery platforms from which to choose. Likewise, because the cost of inputs has risen and ready-to-eat products remain a second-choice preference relative to freshly prepared meals, **exports have gone from growth of 2.6% in 2022 to a contraction of between -3.0% and -4.0% in 2023.**
- **Cereals: The quantity of goods distributed domestically should rise by 3.0-4.0%** (+3.5% in 2022) on growing interest in personal health and ongoing urbanization, which is adding to demand for easy-to-eat foods. However, supply to world markets has risen and overseas consumers have access to a wider range of choices, so having jumped 11.5% in 2022, **2023 exports will be up by 1.0-2.0%.**
- **Soup:** Consumer preference for fresh foods and increasing worries over personal health that have cut demand for salt-rich products will feed through into a **-2.0% to -3.0% fall in domestic distribution quantity** (growth was flat in 2022). These factors are also affecting overseas markets and so having slipped -7.3% in 2022, **exports quantity will slump by another -12.5% to -13.5%.**

Figure 1: Thai Ready-to-eat Exports Forecast



Source: MOC, Forecast by Krungsri Research

Figure 2: Ready-to-eat Domestic Consumption Forecast

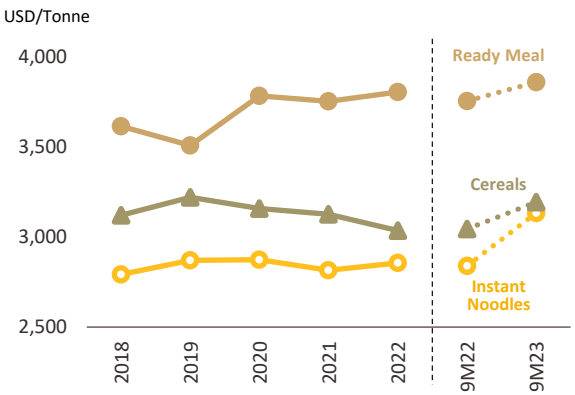


Source: Euromonitor, Forecast by Krungsri Research

2024-2026 Outlook

- **Over the next 3 years, the overall quantity of goods distributed to the domestic market will rise by 3.0-4.0% annually** on: (i) rising consumer spending power as a result of economic growth; (ii) expansion in distribution through modern retail outlets; (iii) the development of new product lines, especially of health foods; and (iv) increasing demand for easily prepared foods as economic activity bounces back. **Exports will also expand, rising by some 5.0-6.0% per year**. Overseas markets will be helped by: (i) a pick-up in economic activity; (ii) low prices, which will be especially attractive against the backdrop of the rising cost of living; and (iii) ongoing urbanization and the increasing access to these products (both online and offline) that this will bring.
- **Risks facing the industry will include:** (i) disruption to weather patterns that may affect supply chains and add to the cost of inputs; (ii) potential government action to place taxes on high-sodium foods; (iii) the imposition of NTBs (especially relating to environmental issues) that will push manufacturers to adjust their production processes and switch to different packaging, thus adding to costs; and (iv) higher transportation and packaging costs as a result of war and other geopolitical tensions.

Figure 3: Exports price of Ready-to-eat Products



Source: MOC

Beverages

Situation in 2023

Output slipped -3.8% YoY over 9M23 following the introduction of stage 3 of the sugar tax in April 2023, which encouraged producers of non-alcoholic drinks to cut back on output and instead to run down inventories. At the same time, production by brewers and distillers was hit by the rising cost of inputs (prices for malt and unmilled rice were up by respectively 33.4% and 17.7% YoY). **Domestic distribution by quantity rose 6.7% YoY** on a 9.8% YoY increase in sales of non-alcoholic drinks that was driven by: (i) the summer heatwave; and (ii) the improving outlook for the restaurant, hotel, and tourism industries. However, increasing concerns with personal health and the run-up in the cost of living, which encouraged some consumers to cut back on unnecessary spending, meant that demand for alcoholic drinks fell -2.9% YoY. **Exports volume also edged down -1.6% YoY** as a result of: (i) weakening consumer purchasing power in overseas markets, especially in Cambodia and Myanmar; (ii) the neighboring country's currency has depreciated, leading to increased costs for imports; and (iii) the imposition of barriers to the import of some beverages from Thailand.

- **For all of 2023, output will decline by -3.5% to -4.0%** due to consistently high prices of raw materials such as rice (+17.7% YoY) and sugarcane (+6.6% YoY). Additionally, there is an accumulation of high inventory levels (+16.3% YoY). **Domestic distribution quantity to increase of 4.0-6.0%** in domestic distribution. However, as a result of continuing blocks from major traders on imports volume from Thailand, **exports will be down by between -0.5% and -1.5%.**

2024-2026 Outlook

- **Output is expected to expand by 1.5-2.5% per year** over the next three years, lifted by accelerating economic activity and the development of new product lines, in particular drinks targeting more health-conscious consumers. **Domestic demand volume should strengthen by 3.0-4.0% annually** on: (i) the hotter weather that the current El Niño will bring; (ii) the continuing rebound in industries connected to tourism, eating out, and nightlife; (iii) growth in modern trade, which will increase consumer access to manufacturers' product lines; and (iv) strengthening consumer spending power, which will track growth in the economy. **Exports volume will expand by 1.5-2.5% per year** thanks to the expected opening up of border crossings linking to neighboring countries. Non-alcoholic drinks remain popular in overseas markets, but sales of alcoholic drinks will come under pressure from weak purchasing power, and as consumers cut back on purchases of these, exports will decline.
- **Risks facing the industry will include:** (i) higher costs as a result of El Niño-induced reductions to crop yields; (ii) the sugar tax; (iii) rising concerns with personal health and prohibitions on advertising alcoholic drinks; (iv) stiffening competition in the beer market due to the entrance of new players; and (v) the potential impact of war on the cost of packaging and of oil.

Figure 1: Ingredient and Material Costs

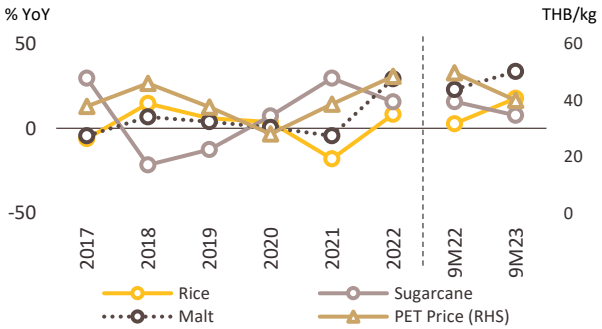


Figure 2: Thai Beverage Production Forecast

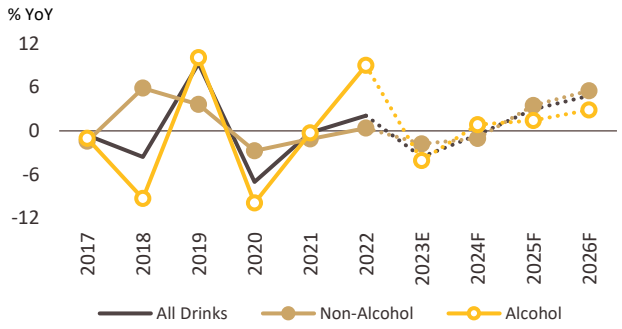


Figure 3: Domestic Beverage Consumption Forecast

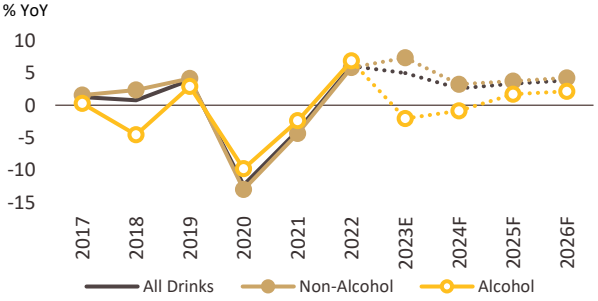
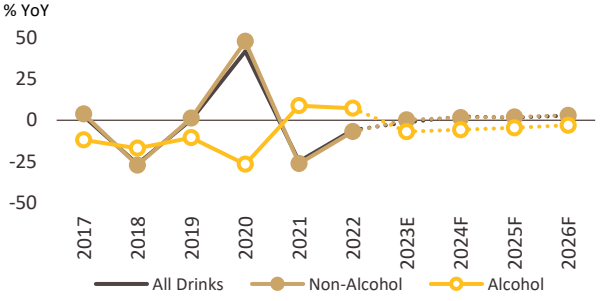


Figure 4: Thai Beverages Exports Forecast



Source: OIE, Euromonitor, MOC, Forecast by Krungsri Research

ENERGY & UTILITIES

Power Generation

Situation in 2023

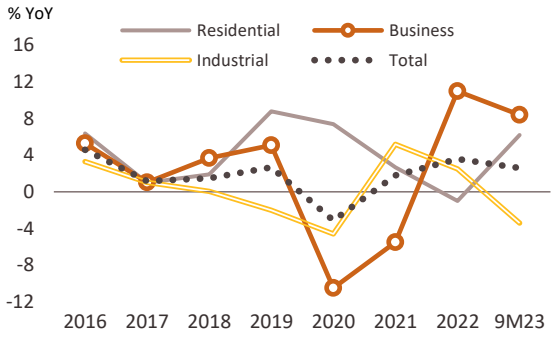
- **Over 9M23, demand for electricity rose 2.6% YoY.** Compared to 9M22, demand from households (28.6% of all demand) was up 6.2% following hotter than normal weather, while the rebound in the tourism sector meant that demand from businesses (24.5% of the total) jumped 8.4%. However, consumption of electricity by industry (42.1% of the total) fell -3.4% following the -3.4% contraction in the export sector. Demand was also affected by the need to raise tariffs to reflect higher energy costs (gas prices were up by an average of 20.6% YoY), and the Ft charge also rose to THB 2.471 per unit for business and industrial buyers. Peak demand hit 34,130.50 MW in May, a 5.8% increase from 2022's maximum.

  Electricity consumption will continue to strengthen through the rest of 2023. Demand will be lifted by the return to growth of the export sector (exports continued to expand as the 3rd consecutive month in October 2023), the end of year celebrations, and government help with electricity bills (tariffs are now down to THB 3.99/unit from an average of THB 4.86/unit in 1H23). Given this, **overall demand is expected to increase by 3.0-3.5% this year, compared to growth of 3.6% in 2022.**

- **Total electricity generation increased 2.9% YoY in 9M23, compared to 9M22. Production by EGAT (32.0% of the total) rose** 8.8% (this came from natural gas and large scale-hydro power, while for IPPs (25.1% of the total), SPPs (23.4%) and VSPPs (5.5%), increases of respectively 8.2%, 2.6% and 2.3% were reported. However, imports of electricity (14.1% of the total) slipped -14.6%. The most widely used fuel was natural gas (responsible for 58.0% of power generation), usage of which jumped 12.4% YoY, partly due to new power stations coming online. Production from renewables (10.4% of the total) also rose 6.5% YoY.

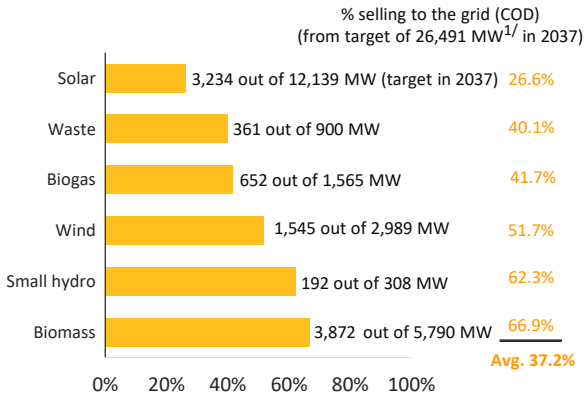
- **As of 1H23** (the latest data available), **contracts to supply the grid** showed that total installed renewables capacity came to 9,946 MW, up 2.1% from the end of 2022, with supply from biomass and solar increasing by respectively 2.8% and 3.2%. Actual supply to the grid stood at 37.2% of the 26,491 MW target set out in the AEDP for 2037, though for biomass, installed capacity was 66.9% of the 5,790 MW target.

Figure 1: Electricity Consumption Growth by Sector



Source: Energy Policy and Planning office (EPPO)

Figure 2: Renewable Energy Generation Capacity and AEDP* Target (as of 1H23)

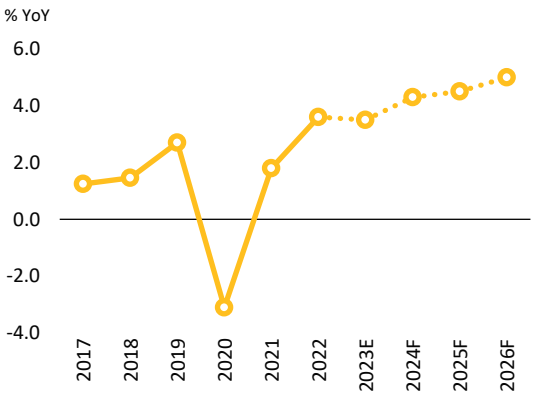


Source: Department of Alternative Energy Development and Efficiency (DEDE)
Note: Including off grid power generation
* Alternative Energy Development Plan 2018
1/ This does not include 2,918 MW of power from large-scale hydro.

2024-2026 Outlook

- **Business conditions will continue to improve,** and electricity consumption is expected to rise by an average of 4.0-5.0% annually. Demand will be boosted by ongoing domestic economic growth. Installed capacity will rise with the implementation of the PDP and ADEP, and this will then support an expansion in private-sectors investment and generating capacity. Trends for investment and income for individual segments are described below.
  - **IPPs: Income will improve** as operators invest in new gas-fired power plants in the Northeast and South that will replace 6,969 MW of supply for which supply contracts are expiring over 2030-2037. Players will also benefit from investments in renewables and hydrogen-based power generation.
  - **SPPs: Income will gradually strengthen** on: (i) investment in new natural gas cogeneration plants to replace power plants coming to the end of their life in 2025; (ii) costs for power generation by SPP hybrid firms that will run to just THB 1.89/unit compared to expected tariffs of THB 4.0/unit; and (iii) investment in new power plants in the EEC.
  - **VSPPs: Income and investment should become more predictable** thanks to: (i) government plans to increase purchases of power from renewables to 11,095 MW by 2030; and (ii) the enforcement of net zero policies through BOI investment support schemes, which will offer tax waivers to electricity producers exploiting sources of clean energy.

Figure 3: Growth of Electricity Demand



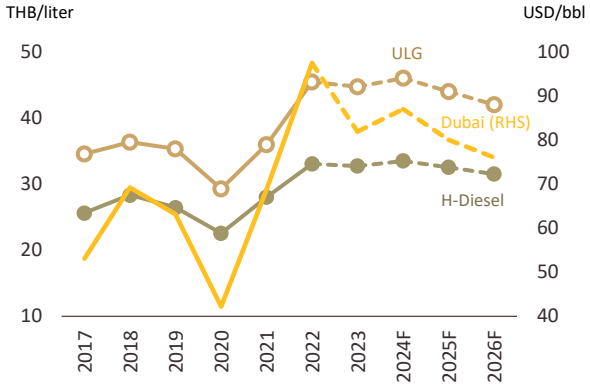
Sources: EPPO, Forecast by Krungsri Research

Oil Refineries

Situation in 2023

- **A 2.1% expansion in demand for refined products supported an improving outlook for refineries over 9M23.** Demand was boosted by recovery in the tourism sector and the resulting uptick in activity in the transport industry, which then contributed to increases of respectively 4.9% and 65.2% YoY in consumption of gasoline and jet fuel. However, exports contracted -3.4% YoY, undercutting demand from industry and reducing consumption of diesel and fuel oil by -4.5% and -11.4% YoY. At the same time, Thai gross refinery margins (GRMs) tightened on sluggishness in the global economy and falling crude prices (Brent prices were down -20.7% YoY in the period). These thus moved in line with Singapore GRMs, which narrowed from USD 14.7/bbl in 1H22 to an average of USD 6.1/bbl in 1H23.
- Through the latter half of 2023, **GRMs should widen slightly relative to their level in 1H23** due to elevated oil prices. OPEC+ cuts to production quotas and the fighting between Hamas and Israel will tend to keep crude prices high, and so for all of 2023, Dubai crude is forecast to average USD 83/bbl (-13.8% YoY). The market will also be affected by the New Year celebrations, and so **overall domestic demand for refined products for the whole year should be up by 2.0-2.5%,** while GRMs will average USD 6.0-6.5/bbl, down from USD 11.1/bbl in 2022.

Figure 1: Oil Prices



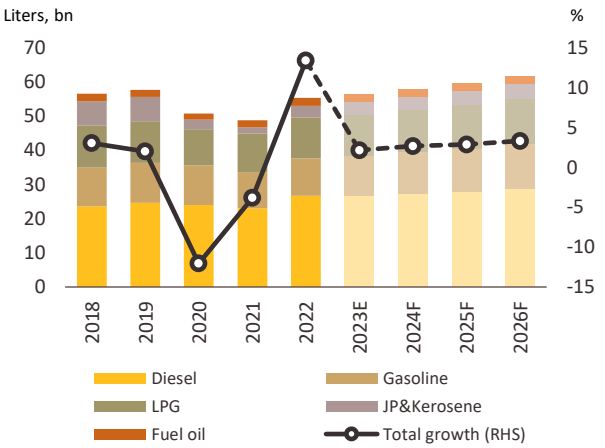
Source: Bloomberg, Energy Policy and Planning Office (EPPO), Forecast by Krungsri Research

2024-2026 Outlook

Krungsri Research sees Dubai crude prices averaging USD 87/bbl across 2024 on a combination of OPEC+ production cuts that aim to keep supply tight and prices high, and geopolitical risks arising from the ongoing Ukraine-Russia war and the fighting in the Middle East, which will periodically add to market worries. **Crude prices will thus remain volatile and elevated in 2024, but these are expected to slip back to USD 80/bbl and USD 76/bbl in 2025 and 2026** as fighting subsides, though prices are unlikely to return to their pre-Covid level. Details of the market outlook are given below.

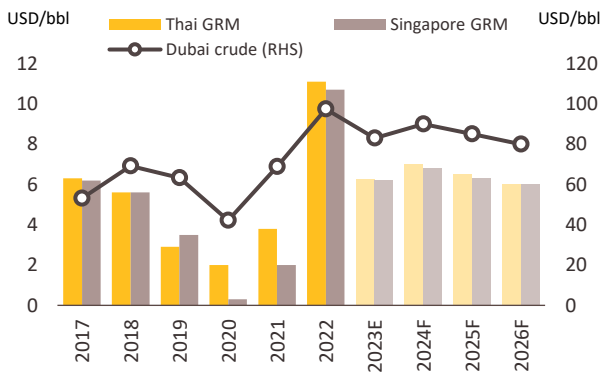
- **Domestic demand for refined products will expand by some 3.0-3.5% per year,** tracking an uptick in economic activity that will support growth in the economy of 3.0-3.4% annually. Growth will come in particular from the rebound in the tourism sector, with tourist arrivals now expected to return to their pre-Covid level by 2025, as well as from anticipated 3.0-4.0% annual growth in sales of new autos. Overall demand will thus increase from both the industrial sector and the transport industry.
- **Domestic pump prices will rise in 2024 on higher crude prices before easing back somewhat in the subsequent two years.** Prices for gasoline are therefore expected to increase to THB 46/liter in 2024 but then to fall to THB 44/liter and THB 42/liter in each of 2025 and 2026. Over the same 3 years, diesel prices are forecast to average THB 33.5/liter, THB 32.5/liter, and THB 31.5/liter.
- **GRMs are expected to be in the range of USD 6-7/bbl, which is higher than USD 5/bbl observed during the pre-COVID period from 2012-2019.** Thanks to ongoing economic growth and rising demand, capacity utilization is also expected to be in the range of to 85-90 %.

Figure 2: Domestic Petroleum Demand



Source: EPPO, Forecast by Krungsri Research

Figure 3: Gross Refinery Margins (GRM)



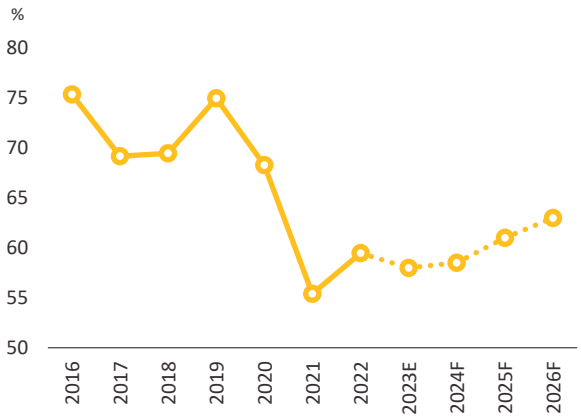
Source: Bloomberg, Forecast by Krungsri Research

Ethanol

Situation in 2023

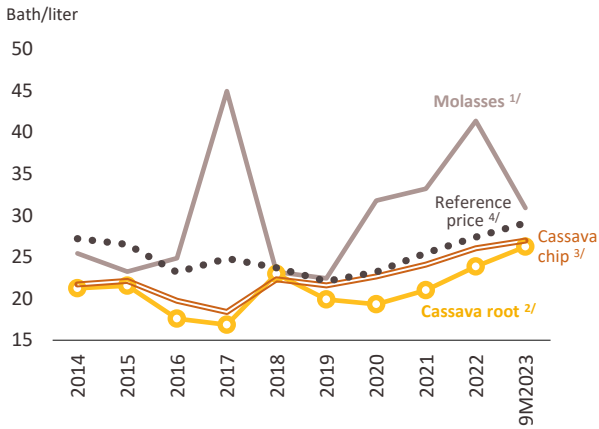
- **Demand for ethanol contracted -8.7% YoY to an average of 3.6m liters/day over 9M23.** Declines were driven partly by EVs' increasing market penetration, and partly by the -80.5% YoY crash in demand for E85 gasohol. The latter was a consequence of the Oil Fund ending its price support, which then encouraged consumers to switch to lower-priced E10 (95) (58% of gasohol sales) and E20 (19.1% of sales), leaving E85 with just a 0.6% market share, down from 3.1% in 9M22. Demand for ethanol should pick up through the remainder of 2023 as the tourism industry moves into the high season (October 2023-March 2024) and the country celebrates New Year, and this will then help to **limit annual declines to -6.7%. 2023 daily consumption should average 3.6m liters/day, down from 3.9m liters/day in 2022.**
- Over 9M23, output averaged 3.8m liters/day (-8.9% YoY). Molasses-based production averaged 2.35m liters/day (-6.9% YoY), cassava-based production came to 1.2m liters/day (-15.3% YoY), and production from sugarcane totaled 0.2m liters/day (+12.4% YoY). **Output should increase over Q4 on stronger demand, and so for 2023, production is forecast to decline by between -2% and -3% YoY.** Capacity utilization will also slip from 2022's 59.5% to 58.0%.
- **The high cost of inputs has squeezed margins.** In particular, cassava shortages have increased pressure on supplies from other industries, including producers of animal feed, and this then pushed up the cost of fresh cassava by 17% YoY to an average of THB 2.9/kg. As such, the cost of producing ethanol from fresh cassava rose 11.2% YoY to THB 26.2/liter, while prices for cassava chip climbed 6.4% YoY to an average of THB 7.2/kg, lifting the cost of using this to produce ethanol to THB 27/liter (+4.4% YoY). Likewise, weak domestic sugarcane yields in 2022 kept prices elevated into 2023, although these dropped -36.8% YoY to THB 5.3/kg, undercutting prices for ethanol production by -30.3% YoY to THB 29.7/liter.

Figure 1: Ethanol Capacity Utilization



Source: Department of Alternative Energy Development and Efficiency (DEDE), Department of Energy Business (DOEB), Forecasted by Krungsri Research

Figure 2: Cost of Ethanol Production vs Reference Prices

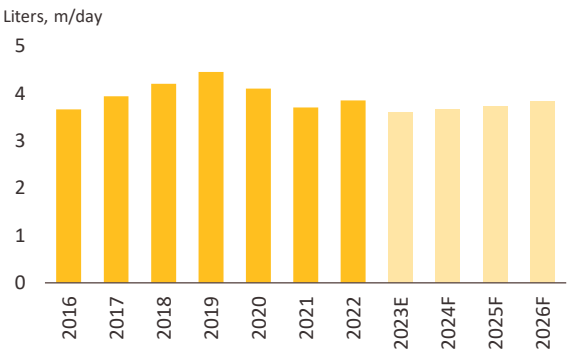


Source: 1-3/ based on the formula of cost structure from Bank of Thailand (BOT), calculated by Krungsri Research
4/ Energy Policy and Planning Office (EPPO)

2024-2026 Outlook

- **Over the next 3 years, demand for ethanol is forecast to strengthen by 2.0-2.5% annually** to around 3.5-3.8m liters/day. Tailwinds supporting the market will include the following:
  - **Demand for transport fuels will rise on an improving outlook for the transport sector and for the economy overall.** Domestic tourism will return to its 2019 pre-Covid level in 2023, while international tourists are expected to increase to levels seen in 2019 within the year 2025.
  - **The authorities plan to make E20 the standard gasohol mix.** This will thus be priced THB 3 cheaper than gasohol 95, and E10 (91) and E85 will gradually be withdrawn from sale.
  - **The number of vehicles on Thai roads running on gasohol is forecast to grow by 1.5-2.5% per year,** and all new models will be capable of running on E20.
  - In addition to its other uses as a source of alcohol and as a fuel, **the authorities are promoting ethanol as an input into the production of bioplastics.** Thai and overseas players have thus engaged in joint ventures to manufacture bio-polyethylene using ethanol as a feedstock.

Figure 3: Ethanol Demand



Source: DEDE, DOEB, Forecasted by Krungsri Research

Biodiesel

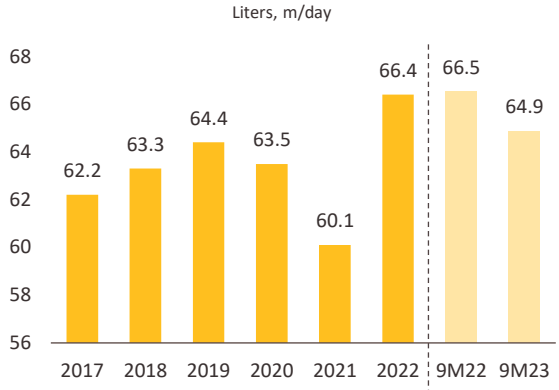
Situation in 2023

- **9M23 production of biodiesel surged 25.3% YoY to an average of 4.5m liters/day** on an increase in economic activity, which was driven in particular by the rebound in the tourism sector, and as Thai and international tourist numbers rose, demand for travel services climbed. In addition, demand was boosted by the government decision to increase the standard diesel mix from 5% (B5) to 7% (B7) biodiesel. This aimed to: (i) support domestic prices for crude palm oil (CPO) following the return of Indonesian exporters to global markets, which added to global yields and undercut prices; and (ii) alleviate the cost-of-living crisis by reducing diesel pump prices (biodiesel prices crashed -31.2% YoY over 9M23). As a result, **consumption of B100 biodiesel jumped 21.1% YoY to a daily average of 4.35m liters.**
- **Demand will continue to strengthen across Q4** due to the decision to extend the use of B7 as the standard diesel mix through to the end of 2023 (to firm up softening CPO prices) and the additional demand triggered by the year-end celebrations. Average daily output and consumption of biodiesel in 2023 is expected to come to respectively 4.6m liters (up 20% YoY) and 4.4m liters (up 16.3% YoY). **Capacity utilization will rise to 44.6%** from 37.1% last year.
- **The biodiesel reference price slumped -31.2% YoY** to THB 33.9/liter, or THB 39.2/kilogram. Prices were driven down by the increase of domestic supply, which at 0.285m tonnes/month was ahead of average demand of 0.206m tonnes/month, and as such, domestic CPO inventories swelled. Global yields of palm oil rose, and so Thai exports underwent a significant contraction. The net result of this is that domestic **prices for CPO and palm stearin slumped -34.0% YoY and -33.9% YoY** to THB 31.2/kg and THB 31.8/kg. Alongside this, the **CPO-biodiesel spread** also narrowed from THB 9.6/kg in 9M22 to an **average of THB 8.0/kg in 9M23.**

2024-2026 Outlook

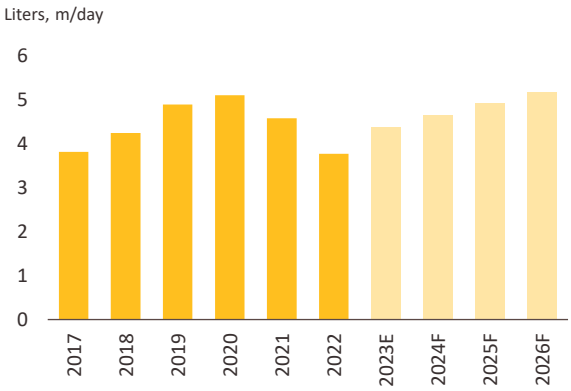
- **Conditions will remain positive for the biodiesel industry through the next 3 years, with demand likely to expand by 5.0-6.0% per year** to an average of 4.5-5.0m liters/day. Positive factors affecting the market will include the following.
  - **Demand for diesel-powered transport will strengthen** on: (i) predicted economic growth together with the revival of the tourism industry (arrivals should hit 43m by 2026); (ii) ongoing expansion of the e-commerce sector, which will boost demand for commercial transportation services, especially for delivery by pick-ups; and (iii) an average annual increase of 3.0-4.0% in the number of diesel-powered vehicles on Thai roads.
  - **The government will aim to balance the market for palm oil by promoting consumption of biodiesel.** This will involve absorbing additional supply and placing a floor under prices by increasing the proportion of B100 biodiesel included in the regular diesel mix, better managing palm oil stocks, and extending the timeframe for making subsidies to fuels that include biofuels until 24 September 2024.
  - **Auto manufacturers are developing diesel engines that can run on much higher biodiesel mixes** in large commercial vehicles, pickups, SUVs, and trucks.

Figure 1: Domestic H-Diesel* Usage (average)



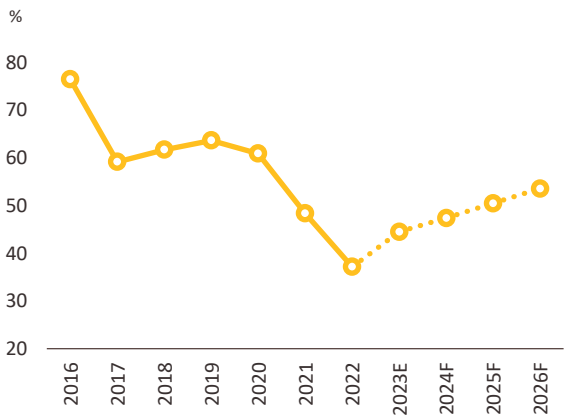
Source: Department of Energy Business (DOEB)
Note: * = B7, B10, B20, Premium Diesel

Figure 2: Biodiesel Consumption



Source: Department of Alternative Energy Development and Efficiency (DEDE) , DOEB, Forecasted by Krungsri Research

Figure 3: Capacity Utilization of Domestic Biodiesel



Source: DEDE, DOEB, Forecasted by Krungsri Research

PETROCHEMICALS

Petrochemicals

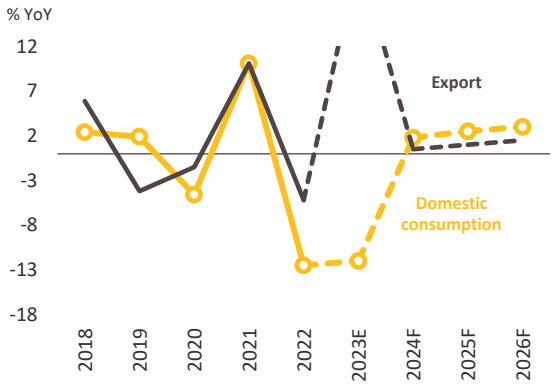
Situation in 2023

- **Domestic demand for petrochemical products fell -20.9% YoY over 9M23** on the -3.4% YoY contraction in the export value, which then weighed on sales into downstream industries using petrochemicals as an input. However, the reopening of China, Thai players' primary overseas market, lifted the volume of Petrochemical exports by 34.9% YoY, though weak demand from industrial consumers fed into a drop in prices for some product groups. At the same time, strength in oil markets (prices for Brent averaged USD 82/bbl) meant that the cost of precursors remained high, and so for many products, spreads tightened. Continuing growth in the tourism sector and traditional New Year celebrations will boost consumption through the rest of the year, helping to hold the decline in **demand across 2023 to somewhere between -10.0% and -15.0% YoY, while exports will be up by 35.0-40.0% YoY.**
  - **Naphtha:** Prices averaged USD 649.8/tonne (-19.9% YoY) in 8M23 due to the high cost of oil (prices remained significantly above 2019's USD 530.8/tonne). For all of 2023, naphtha prices should average USD 650/tonne.
  - **Upstream petrochemicals:** Over 8M23, spreads averaged USD 247.4/tonne (-23.8% YoY) for ethylene and USD 250.4/tonne (+8.2% YoY) for propylene. For the year, these should remain roughly unchanged at USD 247/tonne and USD 250/tonne respectively.
  - **Downstream petrochemicals:** 8M23 spreads averaged USD 112.8/tonne (+70.0% YoY) for HDPE and USD 87.1/tonne (-78.6% YoY) for polypropylene, while for all of 2023, spreads will run to USD 112/tonne and USD 87/tonne respectively.

2024-2026 Outlook

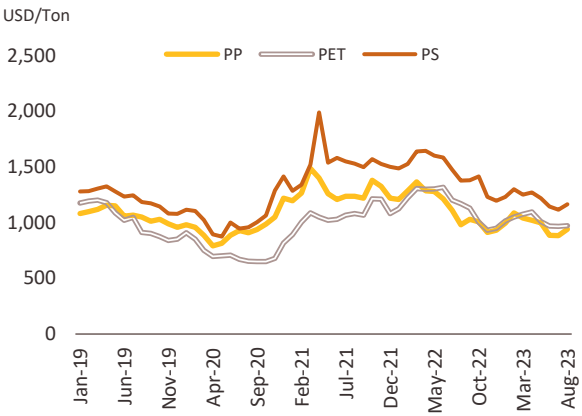
- **Demand will rise over the next 3 years** as the global economy strengthens (the IMF expects global GDP to expand by 2.9-3.2% in the period), lifting consumer purchasing power and adding to demand for petrochemicals from downstream industries. However, the impact of these tailwinds will be limited by bans on the distribution of single-use plastics and the promotion of low-carbon, environmentally friendly alternatives. Supply will also be affected by an expansion in production capacity coming in particular from new facilities in China and the Middle East, and this will then put downward pressure on prices for some products. As such, **demand on domestic and export markets is forecast to expand at average annual rates of 2.0-2.5% and 0.5-1.0%.**
- **In the coming period, players will tend to overhaul production lines as they switch to the manufacture of specialty products** such as ABS because by responding better to the needs of S-curve industries (e.g., manufacturers of EV auto parts, batteries, and medical devices), they will be well placed to add additional value to their product lines. Players will also adapt to deepening environmental concerns by placing a greater emphasis on the production of biodegradable, recycled and food grade plastics.

Figure 1: Domestic Consumption and Export Sales Growth (Volume)



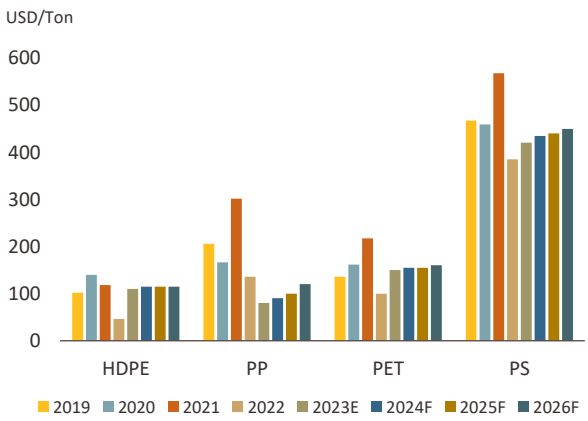
Source: OIE, Forecast by Krungsri Research
Note: Petrochemicals here consist of Ethylene, Propylene, Benzene, Toluene, PE, PP, and PET

Figure 2: Plastic Resin Prices



Source: Bloomberg, Krungsri Research

Figure 3: Global Petrochemical Spreads



Source: Bloomberg, Krungsri Research

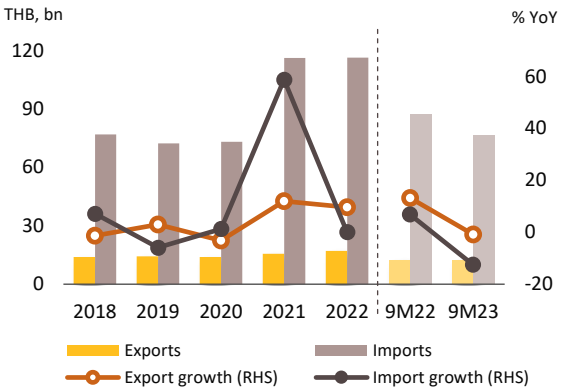
CHEMICAL

Pharmaceuticals

Situation in 2023

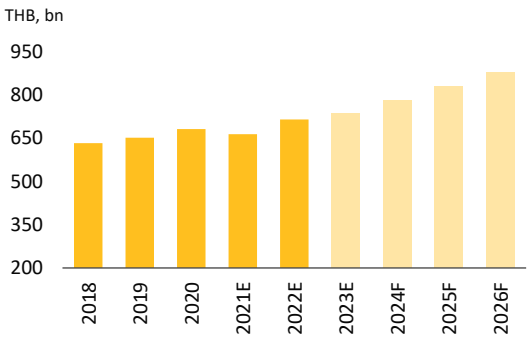
- **Demand has continued to rise on:** (i) the ending of the pandemic and the return of life to normal, which has increased rates of illness; (ii) improved access to medications via the extension of the universal healthcare scheme; (iii) the rebound in the market for health tourism (total tourist arrivals should be back to 27.7m this year, up from 11.2m in 2022); and (iv) an increase in the quantity of treatments distributed through hospitals to elderly patients and those suffering from non-communicable diseases (especially for hypertension and diabetes). Pharmacies have also benefited from the switch to distributing medicines through these (part of the Gold Card scheme), and so **for all of 2023, the value of the pharmaceuticals market is forecast to grow by 5.5-6.0%, mirroring 2022's growth of 5.7%.** For 9M23, the situation was as follows.
  - **Domestic production and consumption of pharmaceuticals**[1/] was lifted by the return of patients to hospitals for the treatment of general conditions and of the spread of seasonal diseases. Data for 9M23 show that infections with notifiable diseases jumped 96.6% YoY, with cases of influenza up 517.5% YoY, and dengue fever up 261.8% YoY. Sales rose 2.0% YoY for tablets (47.6% of the market), +5.9% YoY for solutions (22.9% of the market), +12.5% YoY for injectables (8.5% of the market), +8.1% YoY for capsules (7.9% of the market), +20.0% YoY for creams (7.8% of the market), and +7.3% YoY for powders (5.3% of the market). However, capacity utilization slipped from 61.5% in 2022 to 59.5%.
  - **Exports of medicines and medical supplies inched down -0.9% YoY to THB 12.2bn** on a -29.5% YoY slump in demand for vaccines (6.4% of total pharmaceutical export value), although treatments for diseases and 'other' products (93.6% of the total) increased by 2.0% YoY. Thai exporters' main market is the CLMV nations (50.6% of the total), though sales into these declined -9.9% YoY, while combined exports to Hong Kong, Japan, and the Philippines (19.5% of the total) climbed +27.6% YoY. At the same time, exports of vaccines increased to Hong Kong (+206.2% YoY), Cambodia (+10.6% YoY) and Myanmar (+8.9% YoY). In the period, **imports of pharmaceuticals contracted -12.5% YoY to THB 76.5bn** on an increase in the domestic production of some products. Thus, imports including vaccines fell -31.1% YoY from Germany, -30.1% YoY from the US, and -13.4% YoY from India. Imports of vaccines (29.2% of total pharmaceutical import value) crashed -43.9% YoY on the effective ending of the Covid-19 pandemic, with demand for Moderna and Pfizer products thus suffering.

Figure 1: Thai Pharmaceutical Imports and Exports



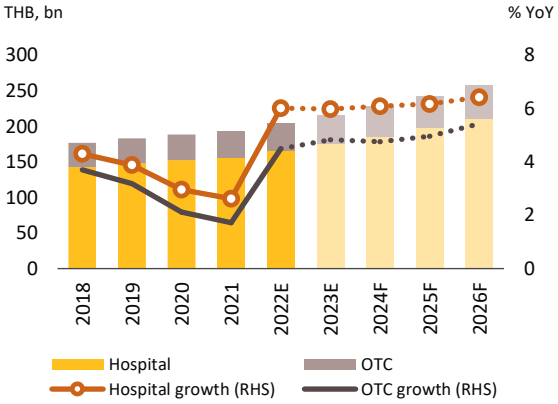
Source: Ministry of Commerce (MOC) HS3001, 3002, 3003, 3004

Figure 2: Thailand's Healthcare Expenditure



Source: Economist Intelligence (EIU), Krungsri Research

Figure 3: Pharmaceutical Market Value Outlook



Source: FitchSolutions, Estimated and Forecast by Krungsri Research

2024-2026 Outlook

- **Distribution to the domestic market is forecast to expand by 5.5-6.5% annually,** helped by: (i) the rising number of individuals affected by ill health, in particular by non-communicable diseases (due to increasing urbanization and the aging of Thai society); (ii) the emergence of new diseases[2/]; (iii) expanded universal health coverage (especially via the Gold Card scheme), which will increase access to pharmaceuticals distributed through hospitals and pharmacies; (iv) greater concern with personal health and preventative healthcare, which is increasing demand for products to boost immunity and to prevent infections; and (v) technological developments and the spread of online platforms that will integrate pharmaceutical supply chains from manufacturers through to patients, thereby increasing access to medicines.
- **Challenges facing the industry will include:** (i) the increasing number of importers active in the market, which will expose domestic producers to challenges from more competitive suppliers based overseas; and (ii) rising production costs, a result of the need to adapt production to the GMP-PIC/S standards and of more expensive imports of active ingredients.

1/ From a survey by The Office of Industrial Economics of domestic manufacturers, most of which produce and distribute generics..

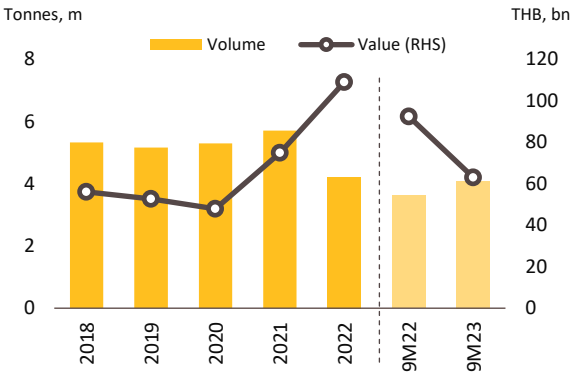
2/ Emerging infectious diseases include: (i) new infectious diseases that have not previously been encountered, treatment of which therefore involves extended research and development; (2) diseases found in new geographical areas; (iii) re-emerging infectious diseases; and (iv) antimicrobial resistant organisms.

Chemical Fertilizers

Situation in 2023

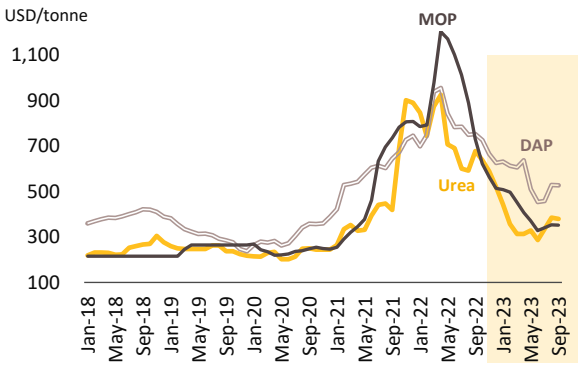
- **The fertilizer market strengthened through 9M23 on:** (i) rising farmgate prices, especially for the major fertilizer-hungry crops of rice (up 27.7% YoY) and sugarcane (+7.6% YoY), as well as for cassava (+16.2% YoY) and maize (+9.6 % YoY); and (ii) the falling global cost of energy (Brent Crude dropped -20.7% YoY), which then reduced pressure on fertilizer prices. Domestic fertilizer prices thus softened on cheaper inputs, especially of urea (-20.4% YoY), and this then encouraged farmers to expand the area under cultivation, with the result that yields edged up 1.6% YoY. Favorable weather and continuing access to irrigation water will sustain demand for fertilizer through the remainder of the year and, so **for 2023 overall, demand for fertilizer should be up 2.2% to 5.52m tonnes.** Details of market conditions follow:
  - **Imports of straight fertilizer (69.8% of fertilizer imports by volume) and mixed fertilizer (30.2% of imports) were up 12.9% YoY to 4.1m tonnes,** though the cost of these contracted -31.9% YoY to THB 63bn. Increases in imports were most pronounced from Saudia Arabia (22.2% of imports), for which these were up 33.0% YoY, China (16.9% of imports, up 16.3% YoY) and Malaysia (10.6% of imports, up 27.5% YoY), though supply from Russia (7.9% of imports) was down -5.1% YoY. **Imports should continue to increase through to the end of the year, partly to build stocks to protect against possible future shortages. 2023 imports are thus expected to rise 13.0% YoY to 4.77m tonnes.**
  - **Exports edged up 3.3% YoY to 0.39m tonnes** (5.0% of total Thai production), generating receipts of THB 6.7bn (-17.5% YoY). Improvements were seen in sales into Cambodia (35.4% of exports, up 13.5% YoY) and Lao PDR (24.7% of exports, up 23.1% YoY). **Across 2023, overseas sales are expected to rise 3.5% YoY to 0.47m tonnes.**
  - **The cost of imports tracked prices on global markets**, crashing -39.7% YoY in the period. These thus averaged THB 13,799/tonne (-42.7% YoY) for straight fertilizer and THB 19,157/tonne (-34.4% YoY) for mixed fertilizer. However, suppliers continued to hold inventory bought when prices were elevated and so domestic wholesale and retail prices slipped only slightly. Average prices for straight and mixed fertilizer therefore came to THB 22,945/tonne (-3.1% YoY) and THB 23,028/tonne (+5.9% YoY).

Figure 1: Thailand Chemical Fertilizer Imports



Source: Ministry of Commerce (MOC)

Figure 2: World Fertilizer Material Prices

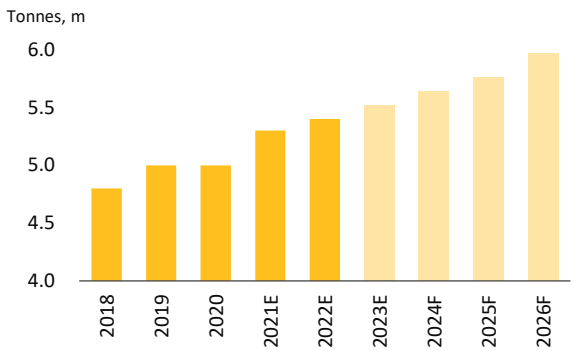


Note: DAP = diammonium phosphate. MOP = muriate of potash (potassium chloride)
Source: World Bank

2024-2026 Outlook

- **The market will continue to grow over the next few years at a rate of 2.0-3.0% annually.** Demand will be boosted by: ***(i) steady expansion in the Thai economy***, which will then increase demand for food crops; ***(ii) stronger international demand for food that will push up prices***, especially for crops such as sugarcane, rice, and cassava (the World Bank sees the global Food Price Index averaging 126.9 over 2024 and 2025, compared to just 89.2 in 2017-2019), while in addition, many countries will try to improve food security and hedge against shortages by building stocks; and ***(iii) with prices rising, Thai farmers will tend to expand the area under cultivation***. Nevertheless, the emergence of an El Niño has significantly raised the risk of severe drought in 2024 and 2025, which would then result in a drop in yields. Demand may be further undercut by the switch by some farmers to the use of organic fertilizers as they respond to increased interest in environmental and health issues. **Alongside this, the falling cost of inputs will be reflected in steadily weakening domestic prices.**
- **Operators will tend to extend and strengthen income streams by expanding the range of distribution channels that they use**. This will include adding value to their products by producing bespoke fertilizers, exploiting online channels to extend their reach, and expanding into high-potential markets in the CLMV nations.

Figure 3: Thai Chemical Fertilizer Consumption*



Note: * Urea, Phosphatic Fertilizers, Potash Fertilizers and Other Products
Source: Office of Agricultural Economics (OAE), IFA, Mordor Intelligence, Forecast by Krungsri Research

AUTOMOTIVE & PARTS

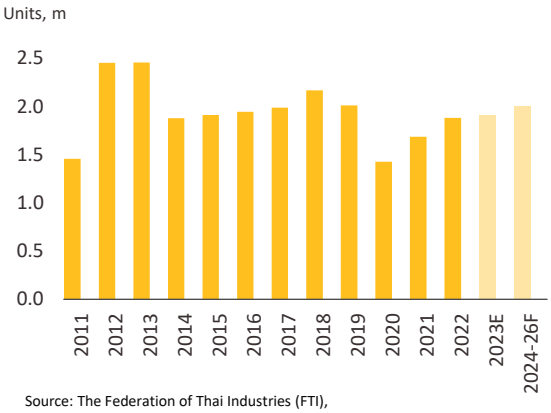
Automobiles

Automakers

Situation in 2023

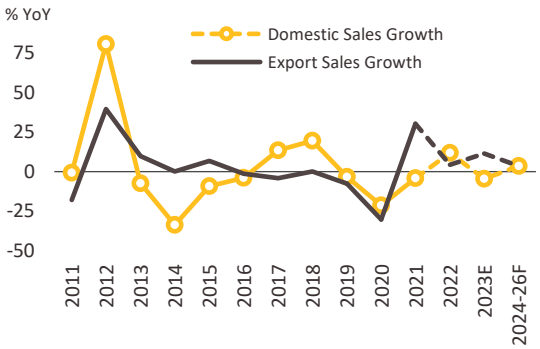
- **Auto production expanded 1.6% YoY over 9M23 to a total of 1,385,971 units.** Assembly lines began to flow more freely once supply chain disruptions had begun to clear, although the industry continued to be troubled by the ongoing US-China tech war and the resulting periodic shortages of some advanced chips. In the period, production of PHEV and HEV cars jumped by respectively 62.6% and 64.4%, dramatically ahead of the 6.2% increase in output of ICE-powered cars.
- **9M23 domestic distribution contracted -7.4% YoY to 586,870 vehicles** on a -20.2% YoY slump in demand for pick-ups, as lenders tightened loan conditions in the face of rising NPLs. This was a result of weakening purchasing power, rising cost of living, higher interest rates, and escalating household debt, particularly affecting the agricultural household. As a result, lower-middle income earners tended to postpone auto purchases, although a revival in economic activity and the rebound in the tourism sector fed a 15.6% YoY rise in sales of passenger cars.
- **9M23 exports increased 16.3% YoY to 821,899 vehicles.** Sales figures benefited from comparison with 9M22, when severe semiconductor shortages handicapped production, and so this year, exports have accelerated to make up for 2022's shortfalls. Export growth was especially noticeable in Saudi Arabia (+64.9% YoY), the ASEAN region (+29.5% YoY), Australia (+8.3% YoY) and Japan (+10.0% YoY).
- **As a result of these factors, production and exports are forecast to expand by respectively 1.0-2.0% and 11.0-12.0% across the year as a whole, although distribution to the domestic market will be down by between -4.0% and -5.0%.**

Figure 1: Automobile Production



Source: The Federation of Thai Industries (FTI), Forecast by Krungsri Research

Figure 2: Growth in Automobile Sales



Source: FTI, Forecast by Krungsri Research

2024-2026 Outlook

- **Auto output will increase** as investments by major manufacturers in new chip fabs pay off and supply to world markets improves. The implementation of government measures to support EV production over 2024 and 2025 together with the requirement to increase domestic production of EVs to compensate for earlier imports will mean that the share of these in total industry output will rise rapidly.
- **Domestic orders will tend to increase** on an uptick in economic activity and the continuing rebound in the tourism sector, which will add to demand for passenger vehicles. Accelerating government spending on infrastructure will also drive additional demand for delivery trucks, though the El Niño will likely cut crop output, and this will eat into sales of commercial vehicles in the provinces.
- **Exports will continue to strengthen,** helped by a combination of economic growth in overseas markets and the release of pent-up demand now that chip supplies have improved and manufacturers are able to tackle the backlog of orders.
- **Given the impact of these factors, output and domestic and international sales should all strengthen by 3.0-4.0% annually.**

Table 1: Automobile Production and Sales Growth

% YoY

	2022	9M2023	2023E	Avg. 2024-2026F
Domestic sales	11.9	-7.4	-4.0 to -5.0	3.0-4.0
Exports	4.3	16.3	11.0-12.0	3.0-4.0
Production	11.7	1.6	1.0-2.0	3.0-4.0

Source: FTI, Forecast by Krungsri Research

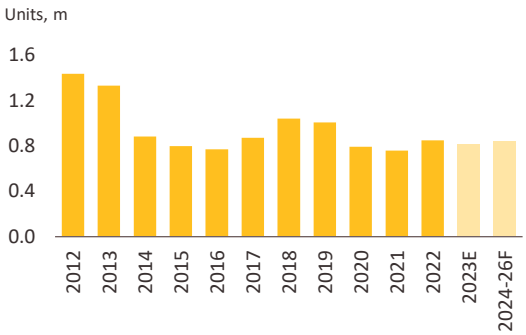
Automobiles (cont.)

Distributors of new vehicles

Situation in 2023

- **9M23 income from auto sales declined in step with the -7.4% fall in domestic sales (down to 0.59m vehicles).** Overall demand was dampened by rising NPLs and the move to tighten lending conditions as spending power weakened, the cost of living rose, and levels of household indebtedness remained high. In particular, this affected the agricultural sector, and so sales of pick-ups slowed even as car sales expanded. Income from servicing and the sale of spares and replacements also edged down slightly due to the -1.6% YoY contraction in the number of vehicles under 5 years old on Thai roads (down to 5.23m).
- **Over the remainder of 2023, income will remain weak on a continuation of the factors described above.** The number of cars sold domestically is forecast to fall to 0.81-0.82m (a decline of -4.0% to -5.0%) and this will then drag on income from sales. Income from servicing and the sale of spares will also remain weak on the -1.0% slide in the total number of vehicles under 5 years old.

Figure 1: Domestic Automobile Sales

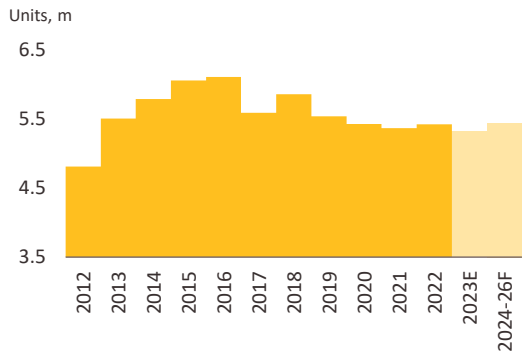


Source: The Federation of Thai Industries (FTI) and Toyota, Forecast by Krungsri Research

Outlook for 2024-2026

- **Over the next 3 years, income will rise** alongside an expanding economy, the recovery in the tourism sector, and continuing investment in infrastructure, which combined should support a 3.0-4.0% increase in the number of vehicles distributed to the domestic market. At the same time, some dealers will begin to switch to the sale of EVs, especially Chinese models, and this will impact distribution of ICE-powered vehicles, though at least initially this will mostly affect second-tier brands.
- **Income from servicing and the sale of spares will soften** following the decline in domestic auto sales over 2020-2023, which then reduced the total supply of vehicles and hence the market available to dealers. In addition, the rapid increase in EV market penetration will also constrain growth in income from repairs since EVs typically contain a smaller number of parts.

Figure 2: Total Number of Cars Aged ≤ 5Y



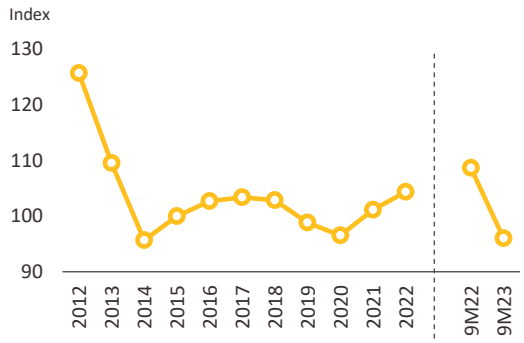
Source: Department of Land Transport (DLT), Forecasted by Krungsri Research; as of Oct 2023

Distributors of second-hand vehicles

Situation in 2023

- **Demand for second-hand vehicles declined in 9M23** from a year earlier when disruption in chips supply made manufacturers unable to keep up with orders and so buyers turned instead to the second-hand market. With demand softening, prices fell by an average of -11.7% YoY. Despite measures to alleviate the impacts of the pandemic and problems with debt that will run from September 2021, to the end of 2023, rising delinquencies and defaults have driven a tightening of lending conditions and swelled inventories. In addition, consumers are increasingly interested in purchasing EVs (registrations of BEVs have jumped 757.79% YoY) but the second-hand market is almost exclusively of ICE-powered vehicles.

Figure 3: Used Car Price Index



Source: Bank of Thailand

- With purchasing power among low- to middle-income consumers strengthening only slowly, **sales of second-hand vehicles will continue to soften through the rest of 2023**. Demand will be further undercut by the implementation of the government's EV 3.5 measures over 2024-2027.

2024-2026 Outlook

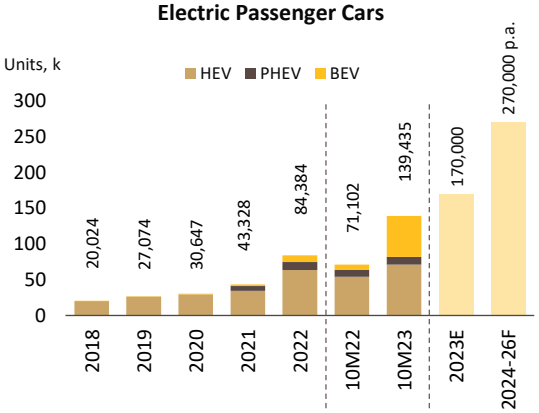
- Sales growth of second-hand vehicles will be sluggish, despite growth in the economy and tourism sector and expansion in delivery services that will support additional demand for second-hand vehicles for commercial use. This will be counterbalanced by government support for the increased use of EVs (EV 3.5 policy), which will cut demand for second-hand ICE autos. Although dealers will begin to stock EVs, inventories will remain limited over the next 2-3 years. At the same time, the supply of second-hand vehicles will likely expand as government debt assistance ends, and this will weigh on prices.

Electric vehicles

Situation in 2023

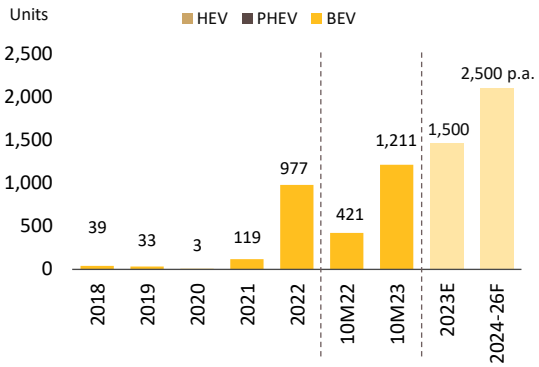
- **Over 10M23, the number of new electric vehicle (xEV) registrations in Thailand increased sharply in all product categories, rising 96.1% YoY for passenger vehicles/cars (to 139,435 vehicles), 187.6% YoY for buses (to 1,211 vehicles), and 797.7% YoY for pickups and trucks (to 395 vehicles).** Sales were lifted by: (i) government support in the form of both subsidies and cuts to excise duties; (ii) the broadening range of models now on sale (as of July, 2023, 37 EV models produced under 21 marques were available to the public); and (iii) continuing improvements to EV efficiency (as of 2023, BEVs in the THB 0.8-1.0 m band had an average single-charge range of over 400km, as per the UN Worldwide Harmonised Light Vehicle Test Procedures (WLTP).
- xEV accounted for respectively 23.9% and 17.3% of all new registrations of passenger cars and buses in the period, although for pickups and trucks, EVs represented just 0.19% of new registrations. Sales of the latter have suffered from their restricted operating range, the lack of charging stations upcountry, and their relative unaffordability. In addition, while EV cars have benefitted from their phased introduction to the market, from HEVs to PHEVs and then BEVs, the market for EV buses and commercial vehicles has transitioned straight from ICE-powered vehicles to BEVs, and adaptation to this change will take some time.
- Sales are expected to accelerate through the remainder of 2023, helped by: (i) the need to meet the conditions set out in the government's EV3.0 support scheme by the end of 2023, which should particularly impact the number of EVs sold at the December Motor Show; and (ii) the increasing use of private EV buses in Bangkok. **For all of 2023, new registrations of xEV cars, buses, and commercial vehicles should thus come to approximately 170,000, 1,500 and 500 vehicles, respectively.**

Figure 1: Newly Registered Electric Passenger Cars



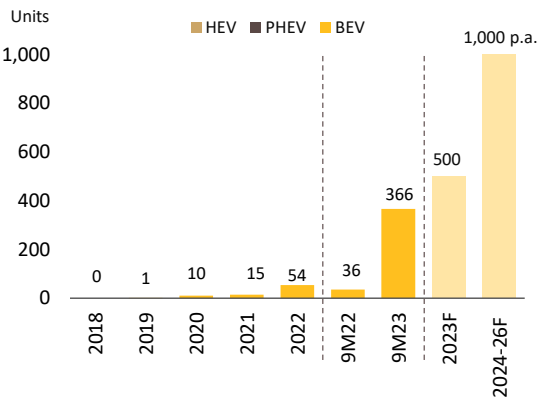
Source: Department of Land Transport (DLT), Forecast by Krungsri Research

Figure 2: Newly Registered Electric Buses



Source: Department of Land Transport (DLT), Forecast by Krungsri Research

Figure 3: Newly Registered E-pickups and E-trucks



Source: Department of Land Transport (DLT), Forecast by Krungsri Research

2024-2026 Outlook

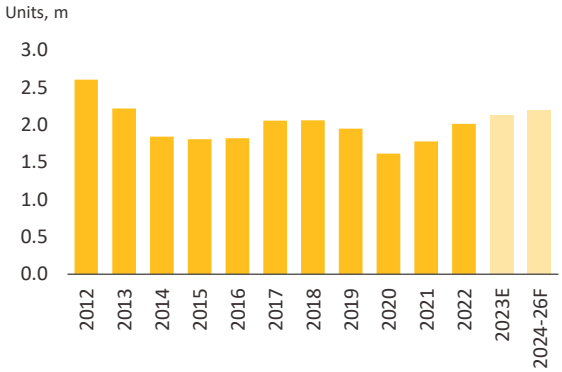
- **Registrations of new xEV cars, buses and commercial vehicles are expected to increase by an annual average of 270,000, 2,500 and 1,000 vehicles each over the next 3 years,** benefit from: (i) the government's EV3.5 support scheme (2024-2027), which will subsidize purchases of EVs by THB 50,000-100,000 per vehicle over 2024-2027; (ii) falling prices as more models become available and more manufacturers begin EV production; (iii) expanding domestic BEV car production over the next 4 years aligned with BOI's incentive packages to produce for import compensation; (iv) a hike in excise rates in 2026 that will pull demand forward; and (v) increasing usage of public and private EV buses (e.g., plans for the EEC see the number of EV buses on the road there increasing to 6,000 by 2028).
- However, the market will have to contend with several headwinds, including: (i) the likely insufficient increase in the number of charging stations; (ii) restrictions on approvals for EV car loans; (iii) all EV buses domestically produced are air-conditioned, while the Department of Land Transport still restricts the proportion of air-conditioned buses to control transportation costs for the lower- to mid-income consumers; and (iv) the continuing limited range of EVs, which restricts their use in inter-province transportation.

Motorcycles

Situation in 2023

- Stronger domestic and export markets supported an **11.1% YoY rise in output of motorcycles over 9M23, which then rose to 1,638,051 vehicles.**
- **The number of motorcycles distributed to the domestic market climbed 6.2% to 1,446,338 vehicles in the period.** Demand benefited from recovery in the tourism sector and transport and delivery industry, especially for food delivery and e-commerce services. Growth should continue through Q4, helped further by higher prices for crops including rice, cassava, sugarcane, corn, and oil palm, and the increases in agricultural incomes that this will bring. However, the run-up in the cost of living and continuing problems with high levels of household debt are feeding a rise in NPLs, and with lenders responding to this by tightening credit conditions, growth has slowed through the second half of the year (down from +9.6% YoY over 6M23).
- **Exports bounced back to a total of 351,548 vehicles in 9M23** (up 22.8% YoY, though this was in comparison to a low 2022 baseline). As elsewhere, the clearing of problems with chip supplies allowed manufacturers to catch up with the backlog of unfilled export orders, especially for big bikes since production of these is much more chip-intensive. In addition, the reopening of countries also allowed for the release of pent-up demand in export markets.
- **For all of 2023, output and distribution to domestic and export markets is expected to rise by respectively 5.0-6.0%, 4.0-5.0%, and 9.0-10.0%.**

Figure 1: Motorcycle Production



Source: The Federation of Thai Industries (FTI), Forecast by Krungsri Research

Table 1: Growth in Motorcycle Production and Sales

%YoY

	2022	9M2023	2023E	Avg. 2024-2026F
Domestic sales	11.6	6.2	4.0-5.0	4.0-5.0
Exports	-1.3	22.8	9.0-10.0	3.0-4.0
Production	13.2	11.1	5.0-6.0	3.0-4.0

Source: FTI, Forecast by Krungsri Research

2024-2026 Outlook

- **The number of motorcycles coming off Thai production lines should expand by 3.0-4.0% annually over the next 3 years** thanks to stronger demand and an uninterrupted supply of semiconductors.
- **Domestic distribution is expected to strengthen by some 4.0-5.0% per year.** Sales will benefit from strong growth for last-mile delivery services for both food and goods in urban areas, as well as from ongoing recovery in the tourism sector, though local tourism in the provinces will be an especially important driver of increased demand for motorcycles. Nevertheless, high levels of household debt will encourage lenders to keep a tight control on the release of new credit, and this will limit the rate at which sales expand.
- **Exports will expand by 3.0-4.0% per year,** although the growth will be at a slower pace from its 2023, supported by i) the reopening of neighboring countries and the rebound in pent-up demand, and ii) the easing of supply chain disruption that then allowed manufacturers to make up for unfilled orders, especially for exports of modern motorcycles and chip-hungry big bikes. However, global markets are swiftly transitioning to a much greater focus on electric motorcycles, but at present, Thai exporters are highly dependent on sales of ICE-powered vehicles, and so manufacturers will need to adapt to rapidly changing conditions.

Auto parts

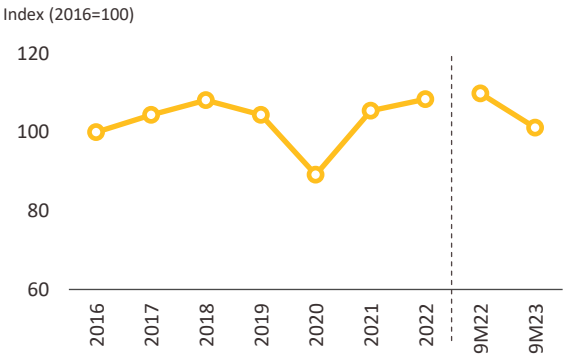
Situation in 2023

- **Output of auto parts contracted over 9M23,** with the industry's MPI falling by -8.0% YoY in the period. Production was undercut by periodic chip shortages that slashed production of electronic parts by -18.0% YoY, while the accelerating switch to EVs reduced output of engines for ICE-powered vehicles by -1.9%. Alongside this, weakening domestic auto sales (-7.4% YoY) and an only slight increase in overall auto output meant that domestic demand for auto parts remained soft. Likewise, exports slipped -2.0% YoY. In particular, overseas sales of tires were impacted by US anti-dumping measures that have been in effect since May 2021 and that have eroded Thai exporters' competitiveness relative to those from countries such as India, Indonesia, and Japan. Similarly, the sharp increase in worldwide sales of EVs has also impacted demand for internal combustion engines.
- **Both output and domestic demand for auto parts should strengthen in the remainder of 2023.** Firmer demand will come from the OEM market, which will be lifted by anticipated growth in production of autos and motorcycles of respectively 1.0-2.0% and 5.0-6.0% in 2023. The REM market may also expand slightly on a possible increase in demand for spares and replacements for vehicles over 5 years old as some consumers who would like to buy an EV have postponed their purchases waiting for further technology development and the increase in the number of charging stations, and these will thus need to maintain aging vehicles in the meantime. However, the market will continue to be affected by high interest rates and weakness in the global economy that will drag on exports. **For all of 2023, the value of auto parts production and of exports of these will contract by respectively -4.0% to -5.0% and -1.0% to -2.0%.**

2024-2026 Outlook

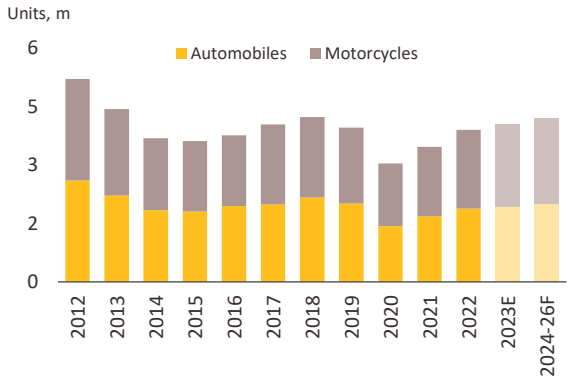
- **Production of auto parts will expand by 3.0-4.0%** annually over the next 3 years as investments in new production facilities ensure that problems with chip shortages will ease. **Domestic demand will also be boosted** by: (i) ongoing economic growth and rapid recovery in the tourism sector; (ii) government spending on infrastructure megaprojects; (iii) continuing growth in e-commerce and delivery services that will then lift demand from the OEM market; and (iv) an average 2.0-3.0% annual expansion in the number of vehicles over 5 years old, which will add to demand from the REM market. **An improving economic outlook in overseas markets will boost exports by 2.0-3.0% annually**, while growing global output of EVs will accelerate production of parts including battery management systems, traction electric motors, drive control units, cabling, connector blocks, plastic and rubber parts, and bodywork. However, parts used in ICE-powered vehicles (e.g., engines, transmission units, gears, radiators, and exhaust systems) will see their export value decline.

Figure 1: Auto Parts Manufacturing Production Index (MPI)



Source: Office of Industrial Economics (OIE)

Figure 2: Vehicle Production (OEM Market)



Source: The Federation of Thai Industries (FTI), Forecast by Krungsri Research

Table 1: Cumulative Registered Vehicles (REM Market)

Units, m

	Automobiles	Motorcycles
2015	15.63	20.50
2016	16.24	20.48
2017	16.97	20.70
2018	17.81	21.08
2019	18.62	21.40
2020	19.20	21.57
2021	19.74	21.84
2022	20.35	22.28
10M2023	20.81	22.64

Source: Department of Land Transport (DLT)

ELECTRONICS & ELECTRICAL APPLIANCES

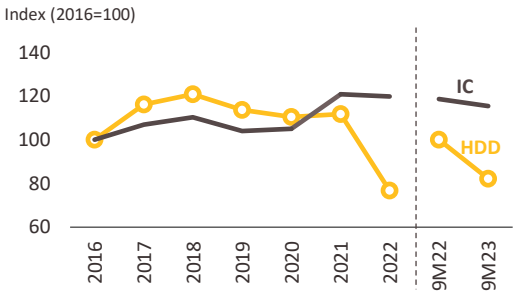
Electronics

Hard Disk Drives (HDD)

Situation in 2023

- **Over 9M23, the HDD MPI contracted -17.8% YoY alongside a -35.3% YoY slump in the value of exports (Thai players' main market)** that was driven by: (i) weakening demand from data centers and IT consumers following the pandemic-era bulge in orders and disruption to manufacturing supply chains; (ii) the rising cost of living and weaker economic conditions in overseas markets, which helped to feed a -22.0% YoY drop in global computer sales; and (iii) the increasing displacement of HDDs by faster and less energy-hungry solid state drives (SSDs).
- Through the rest of 2023, these factors will continue to undercut the production and export of HDDs, and **so for all of 2023, output volume and export value will contract by respectively -16.0% to -17.0% and -30.0% to -35.0% YoY.**

Figure 1: Electronics Industry Manufacturing Production Index (MPI)



%YoY

	2021	2022	9M23	2023E	Avg. 2024F-2026F
HDD	1.1	-31.4	-17.8	-16.0 to -17.0	-14.0 to -15.0
IC	15.1	-0.8	-2.8	-1.0 to -2.0	2.0-3.0

Source: Office of Industrial Economics (OIE), Forecast by Krungsri Research

2024-2026 Outlook

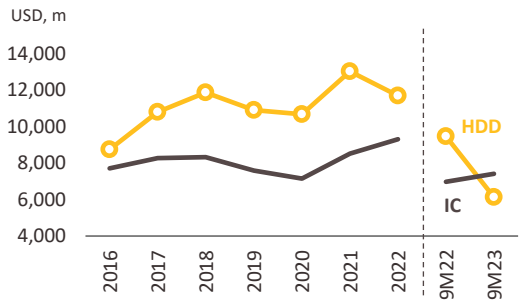
- Sales of HDDs will continue to soften on falling global demand for IT equipment, although Thailand will retain its position as one of the world's major producers and exporters of HDDs. Over the short term, demand will be lifted by upgrades to Windows 11 and the post-Covid surge in purchases of new PCs, which will rise by 4.9% globally in 2024 (source: Gartner), but **through 2024-2026, output and exports of HDDs will contract by respectively -14.0% to -15.0% and -30.0% to -35.0% annually.**

Integrated Circuits (IC)

Situation in 2023

- **The IC MPI edged down -2.8% YoY over 9M23, with growth in export value slowing from 14.2% pa over 2021-2022 to 6.4% YoY** on a drop in sales of semiconductors and PCs of respectively -18.8% and -9.0% YoY. This was caused by: (i) high inflation and sluggishness in the world economy that undercut spending power; and (ii) the impacts of the US-China tech war on supply chains, especially as a result of restrictions on the export of semiconductors and minerals used in chip production.
- Overall global demand for semiconductors will be lifted through Q4 by: (i) a new round of PC upgrades driven by the switch to Windows 11, which Gartner expects will support stronger global demand for PCs as the year ends to lift 2023 sales by 4.9% YoY; and (ii) demand for chips to use in EV production that is increasing worldwide. **These factors will help support improvement of MPI to decline at a slower pace between -1.0% and -2.0%, while exports of ICs will rise by 5.0-6.0% in 2023.**

Figure 2: Electronics Exports



%YoY

	2021	2022	9M23	2023E	Avg. 2024F-2026F
HDD	22.1	-10.3	-35.3	-30.0 to -35.0	-30.0 to -35.0
IC	19.0	9.3	6.4	5.0-6.0	4.0-5.0

Source: Ministry of Commerce (MOC), Forecast by Krungsri Research

2024-2026 Outlook

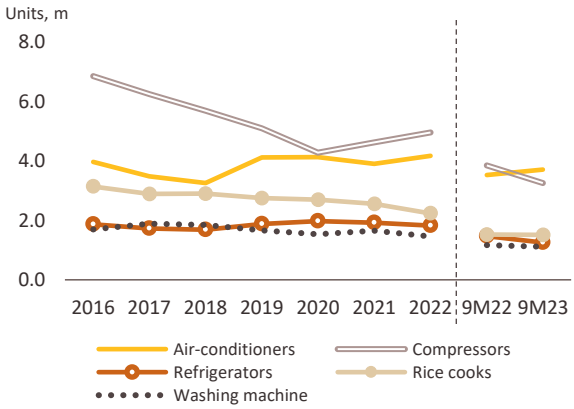
- Global semiconductor sales will strengthen on several positive trends. (i) Demand for AI chips for use in AI-based applications will increase (e.g., in data centers, edge infrastructure, and endpoint devices). Gartner thus estimates that sales of AI chips will jump 25.6% in 2024. (ii) Demand for use in EVs will continue to rise especially with increasing progress on EV full driving automation (the IEA sees global EV sales surging by 18.9% annually over 2023-2030). (iii) A round of PC upgrades is expected in 2024. Stronger global sales and increased investment by overseas players in Thailand-based electronics manufacturing will further support expansion in both domestic production and exports. **Over 2024-2026, the production and export are therefore expected to expand by respectively 2.0-3.0% and 4.0-5.0% per year.**

Electrical Appliances

Situation in 2023

- **Production slipped -6.0% YoY to 38.38m units in 9M23, in accordance with a -5.9% YoY contraction in domestic sales to 10.86m units** as rising inflation and high levels of household debt eroded consumer spending power and the housing market remained sluggish (-19.9% YoY decrease in units sold), though the rebound in the tourism sector and hotter than normal weather boosted sales of air-conditioning units by 5.1% YoY. Comparison with the 2021-2022 high baseline together with the ending of lockdowns and the return of life to normal in overseas markets also meant that export value fell -1.2% YoY.
- These factors, especially the continuing sluggishness of overall housing market, will continue to drag on the market through Q4, and although government measures to stimulate the tourism sector (especially, allowing visa-free travel for tourists from major markets) may encourage hotels and some businesses in other tourism-related parts of the economy to spend on new appliances in response to increasing arrivals, these measures are only temporary and so their effects will be limited. **For all of 2023, domestic production and distribution will therefore slip by between -4.0% and -5.0% YoY, while sales into export markets will be down by between -1.0% and -2.0% YoY.**

Figure 1: Domestic Sales for Selected Electrical Appliances



%YoY

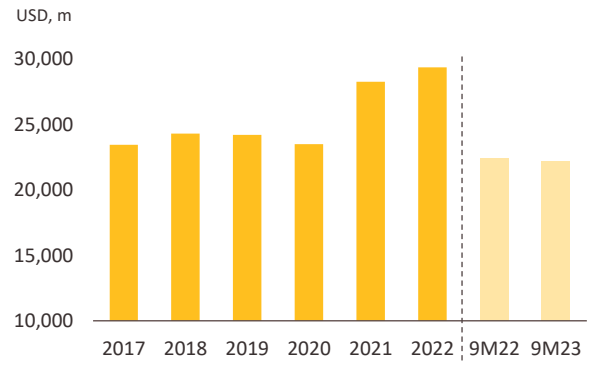
	2021	2022	9M23	2023E	Avg. 2024F-2026F
Domestic Sales	0.3	-0.1	-5.9	-4.0 to -5.0	1.5-2.5

Source: Office of Industrial Economics (OIE), Forecast by Krungsri Research
Note: Survey by OIE: covering only electrical appliances which are produced in Thailand.

2024-2026 Outlook

- **Production should expand in the coming period**, helped by increased access to chips and the clearing of supply chain bottlenecks, and indeed, approvals for investment support for inflows into the electronics and electrical appliance industry increased 211.8% to a total of THB 163bn over 9M23. Sales in domestic market tends to increase on a strengthening economy, a better outlook for the residential property market, and continuing growth in the tourism sector. Exports will also expand, helped by cooling inflation and the acceleration in the global economy, as well as by the need to replace appliances again following the bulge in sales during the pandemic. **These tailwinds will then lift the production and domestic sales to grow at a similar rate of 1.5 - 2.5% annually and boost export value by 2.0-3.0% per year.**

Figure 2: Electrical Appliance Exports



%YoY

	2021	2022	9M23	2023E	Avg. 2024F-2026F
Exports	20.3	3.9	-1.2	-1.0 to -2.0	2.0-3.0

Source: Ministry of Commerce (MOC), Forecast by Krungsri Research

OTHER INDUSTRIES

Medical Devices

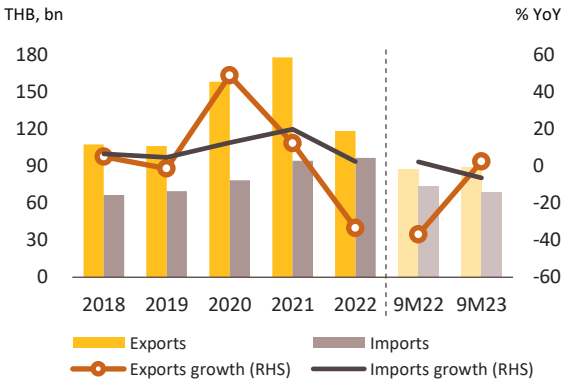
Situation in 2023

- **The market for medical devices has continued to expand** with the easing of the pandemic and the return of hospital services to normal. As worries over infection with Covid-19 have ended, individuals have become more relaxed about wearing masks and maintaining social distancing measures, and this has fed an increase in the spread of communicable diseases (e.g., in 9M23, flu cases exploded 517.5% YoY), while Covid-19 cases continue to be reported. Given this, demand for PPE (e.g., masks and latex/surgical gloves) and related types of medical equipment (e.g., diagnostic solutions and vaccination equipment) has remained strong. Demand has also proven resilient in Thai manufacturers' main overseas markets. **As such, the value of goods distributed to the domestic market in 2023 should rise 5.0-6.0% YoY, while exports are expected to increase by 5.5-6.0%.** The situation for 9M23 was as follows.
  - **Output slowed from a year earlier,** and this was reflected in the softening of the industry's MPI from 105.4 in 9M22 to 101.2 in 9M23. Likewise, capacity utilization slipped from 69.1% to an average of 65.9%. This decline was partly attributable to the rush to step up output a year earlier, particularly of PPE, and thus output of latex surgical gloves (around 90% of all output by the medical devices industry) declined -4.2% YoY.
  - **Export value edged up 2.5% YoY to THB 89bn in the period.** Export value of ***single-use devices*** (87.2% of exports of medical devices by value) rose 4.1% YoY, and so having crashed -74.1% in 9M22, receipts from sales of latex gloves rose 0.9% YoY thanks to the resumption of imports into the US (+26.8% YoY). Sales of ophthalmic equipment were also up 6.8% YoY. Income from ***durables*** (10.6% of the total) dropped -9.8% YoY but receipts from sales of ***reagents & test kits*** (2.2% of the total) rose 5.3% YoY. The most significant increases in income were seen in sales into Japan (+19.1% YoY) and France (+17.9% YoY).
  - **Imports contracted -6.3% YoY to a total value of THB 68bn.** For ***reagents & test kits*** (20.57% of imports of medical devices by value), imports dropped -43.2% YoY on the -43.0% YoY decline in purchases of blood tests. However, imports of ***single-use devices*** (44.7% of the total) and durables (34.6%) rose by respectively +13.8% YoY and +11.2% YoY. Increases were particularly noticeable for ophthalmic supplies (+11.3% YoY) and electro-diagnostic equipment (+13.0% YoY). In terms of originating countries, declines were strongest in China (down -46.7% YoY) due to the strength of orders a year earlier, while increases were most pronounced in imports from the US (+8.3% YoY), Germany (+28.9% YoY), and Japan (+3.7% YoY).

2024-2026 Outlook

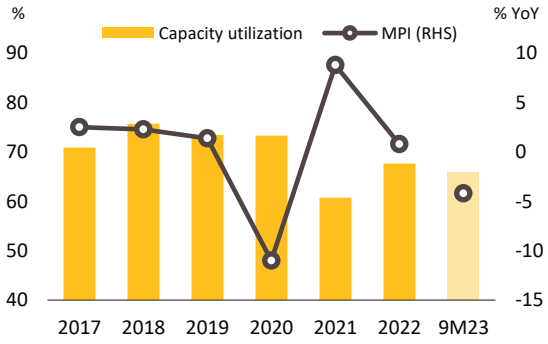
- **Sales of medical devices will continue to rise, and the value of goods distributed to the domestic and export markets is forecast to expand by respectively 6.0-7.0% and 6.5-7.5% annually.** This outlook is supported by: (i) increasing rates of illness as a result of the aging of society, together with the likely emergence of new diseases; (ii) growth in the market for medical tourism, which will be helped by Thai hospitals' high standards and low costs; (iii) rising interest in preventative healthcare, particularly in the wake of the Covid-19 pandemic; (iv) ongoing economic growth in overseas markets; and (v) government policy that aims to promote Thailand as a hub for international healthcare and as a center for the production of medical devices in the ASEAN zone, which is then pulling in additional investment from Thai and overseas sources.

Figure 1: Thailand Medical Device Trade



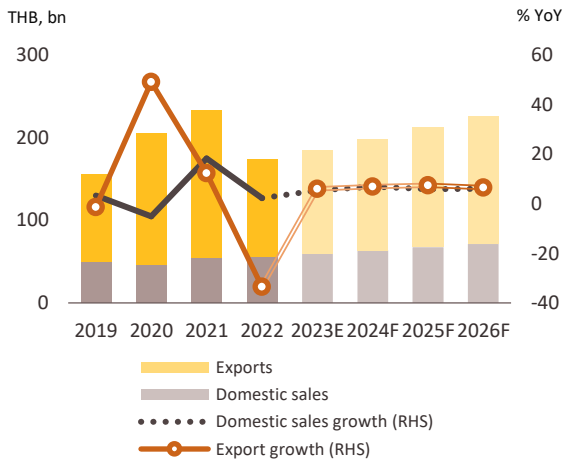
Source: Medical Device Intelligence Unit (MeDIU)

Figure 2: Domestic Medical Device: Capacity Utilization and MPI



Source: Office of Industrial Economics (OIE)

Figure 3: Medical Device Domestic Sales and Exports



Source: FitchSolutions, Forecast by Krungsri Research

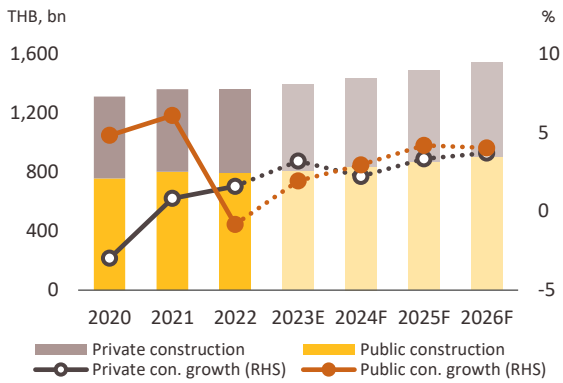
CONSTRUCTION & CONSTRUCTION MATERIALS

Construction Contractors

Situation in 2023

- **Overall spending on construction rose 3.0% YoY through 9M23** to a total of THB 1.1trn. The majority of this came from the public sector, which rose 2.5% YoY to THB 645bn. 81% of the latter was for investments in infrastructure projects, a rise of 1.5% YoY, though this went only to ongoing works and ground was not broken on any new megaprojects in the period. Private-sector spending on construction increased 3.6% YoY to THB 453bn on a rise in investment in non-residential accommodation which expanded 3.9% YoY (47% of all private-sector spending on construction) thanks to construction of factories, office buildings, and commercial building which would facilitate potential investment expansion. Construction of residential real estate grew 3.4% YoY following investment plans, especially locations in which are adjacent to mass transit lines.
- **For the rest of 2023, growth in spending on construction is likely to slow.** Although overall construction investment will continue to grow, the growth would be limited by (i) waiting for clearer policy on the budgets for public construction investment that may cause some infrastructure projects to be delayed; (ii) the high cost of oil which pushed up construction material prices and transportation costs; (iii) labor shortages which continued to delay completion or abandonment of some projects; and (iv) an unclear path to recovery of residential projects and construction. Therefore, for all of 2023, total spending is expected to edge up by just 2.0-3.0%, rising 1.5-2.5% for the public sector and 2.5-3.5% for private sector.

Figure 1: Construction Investment Value



% YoY	2022	2023E	2024F	2025F	2026F	2024F-2026F
Public	-0.8	1.5-2.5	3.0-3.5	4.0-4.5	4.0-4.5	3.5-4.0
Private	1.6	2.5-3.5	2.0-2.5	3.0-3.5	3.5-4.0	3.0-3.5
Total	0.2	2.0-3.0	2.5-3.0	3.5-4.0	4.0-4.5	3.0-4.0

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

2024-2026 Outlook

- **Overall spending on construction should grow by 3.0-4.0% annually**, helped by an acceleration in work on government megaprojects, in particular those connected to the development of the EEC.
  - **Public-sector spending on construction is expected to rise by 3.5-4.0% per year over 2024-2026** on an increase in budget allocations made to both ongoing and new infrastructure megaprojects, as per the 2023-2027 action plan. This will include a pick-up in the pace of work on phases 1 and 2 of the twin-track railway and on new sections connecting to industrial estates and border regions. However, work on many EEC projects is behind schedule, including phase 3 of the Laem Chabang Port development (40% behind schedule as of April 2023) and the high-speed rail-link connecting the 3 airports, for which work should begin in 2024. Progress is most advanced on phase 3 of the Map Ta Phut Port development (60% complete as of August 2023), which should be operational by 2027 as planned.
  - **The value of private-sector construction is forecast to expand by 3.0-3.5% per year.** Activity will be lifted by greater investment in new factories on EEC industrial estates and in new hotels, which will be built to meet rising tourist numbers. Supply gluts will also clear and so the residential segment will rebound, especially in the EEC and in important provincial centers
  - **Large contractors will maintain their advantages over SMEs thanks to their ability to engage in competitive bidding on contracts and to negotiate from a position of strength when dealing with suppliers.** By contrast, SMEs will continue to be dependent on sub-contracting for large players, and so their income will be highly uncertain. To increase their chances of winning public sector and large private-sector contracts, operators, and in particular large contractors, will work hard to cut costs and to speed up project completion times, though players will continue to be troubled by labor shortages and the high cost of materials.

Table 1: Some Megaprojects of Action Plan for Thailand's Logistics Development (2023-2027)*

Project	Timeline	Progress
1) Double Track, Phase 1		
- Lopburi - Pak Nam Pho	2018-2024	In progress
- Mab Kabao - Jira Junction	2018-2026	In progress
- Nakhon Pathom - Hua Hin	2018-2024	In progress
2) Double Track, Phaes 2		
- Khon Kaen - Nong Khai	2023-2027	Not yet started
- Den Chai - Chiang Mai	2023-2027	Not yet started
- Surat Thani - Hat Yai - Song Khla	2023-2027	Not yet started
- Hat Yai - Padang Besar	2023-2028	Not yet started
3) High-speed Rail		
- Connecting three airports, Phase 1 (Don Mueang - Suvarnabhumi – U-Tapao)	2022-2028	In progress
- Connecting regions, Phase 1 (Bangkok - Nakhon Ratchasima)	2018-2026	In progress
4) Laem Chabang Port, Phase 3 (Inpart of Port Authority of Thailand's investment)	2023-2027	In progress
5) National Highway Network	2023-2027	In progress
6) Enhancing Airport Capacity to Connect Transportation Networks	2023-2029	In progress

Source: Office of Transport and Traffic Policy and Planning , as of March 2023
Note: * Action Plan on Thailand Logistics Development 2023-2027, Ministry of Transport's projects

Construction Materials

Situation in 2023

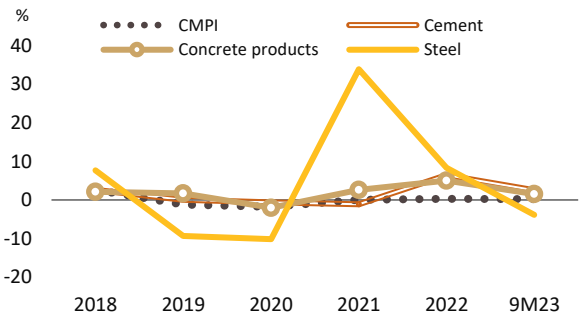
- **For most product groups, production and domestic sales of construction materials fell through 9M23.** Thus, with purchasing power yet to recover fully, the market for repairs and renovation remained weak, especially at the mid to lower end of the market and as a result, the quantity of cement, tiles, and sanitarywares sold within Thailand slipped by respectively -1.5% YoY, -4.5% YoY and -2.1% YoY. Only in the construction steel (bar and section) segment did growth remain positive, and so in the period, production and domestic sales rose by respectively 6.9% YoY and 14.2% YoY. This was driven largely by increases of 2.5% YoY and 3.6% YoY respectively in 1H23 spending on public- and private-sector construction. The lack of work on major public projects and the decision by residential property developers to instead run down their backlog of unsold stock rather than open up sales of new properties means that demand for construction materials will likely weaken further in Q4. **As such, with the exception of steel products, production and sales of construction materials will remain flat or possibly contract slightly across all of 2023.**
- **Sluggishness in overseas markets weighed on exports in 9M23.** Declines of respectively -11.2% YoY and -38.2% YoY in sales into Myanmar and Cambodia fed into a -25.0% YoY slump in **cement exports**, this then falling to 1.3m tonnes. Likewise, export of **construction steel** slipped -6.8% YoY on weakness in the main markets of Malaysia, the Philippines, and Canada. As a result of the glut of unsold real estate, **imports of tiles and sanitarywares** were also weak, though imports of construction steel jumped by an average of 15.7% YoY on strength in the construction sector. **For all of 2023, overall imports and exports of construction materials will therefore likely be down from their 2022 level.**
- **The Construction Materials Price Index edged up just 0.2% YoY in 9M23.** Prices for steel and steel products tracked declines in world markets and so these fell -3.9% YoY, but high costs, in particular for energy, pushed up prices for cement by 2.5% YoY. For the rest of 2023, prices are likely to soften slightly on the easing of cost pressures (i.e., for crude and electricity following government action to address the high price of these). Prices for steel will also slide in line with trends on global markets, and so for 2023, the price index is expected to decline relative to a year earlier

Table 1: 9M23 Growth in the Construction Materials Sector

Product	Unit (mn)	Production	Domestic sales	Exports
Cement	tonnes	32.5	29.1	1.3
% YoY		-0.4	-1.5	-25.0
Construction steel	tonnes	2.9	3.1	0.2
% YoY		6.9	14.2	-6.8
Ceramic tile	sq.m.	94.1	115.2	19.7
% YoY		-8.0	-4.5	-39.5
Sanitary ware	pieces	4.2	2.3	2.0
% YoY		-18.2	-2.1	-29.9

Sources: Office of Industrial Economics (OIE), Iron and Steel Institute of Thailand (ISIT) Ministry of Commerce (MOC)

Figure 1: Construction Materials Price Index

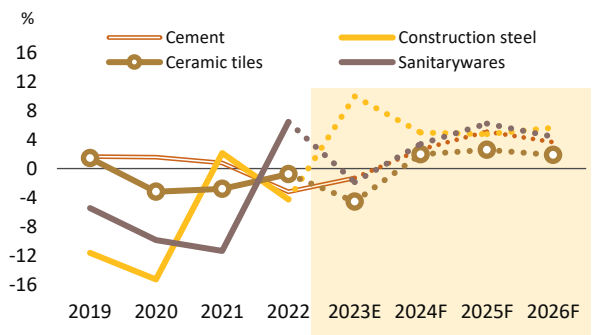


Source: MOC

2024-2026 Outlook

- **Domestic sales will be buoyed** by the following factors.
  - **Spending on construction by the public sector should strengthen by 3.5-4.0% annually** as work accelerates on both new and ongoing megaprojects. In line with the 2023-2027 action plan, efforts will focus in particular on communications and logistics networks that connect to the EEC, as well as transportation infrastructure linking regions and neighboring countries.
  - **Private-sector investment in construction is forecast to expand by 3.0-3.5% per year** thanks to: (i) the crowding-in effects of infrastructure investment; (ii) a pick-up in work on the construction of factories as investment inflows increase and the travel industry rebounds, especially on EEC industrial estates and hotels in tourism areas; and (iii) the return of foreign investors to Thailand and the recovery in the economy, which will lift purchasing power and revive the residential housing market, especially in regional centers and the EEC.

Figure 2: Growth in Domestic Sales Volume



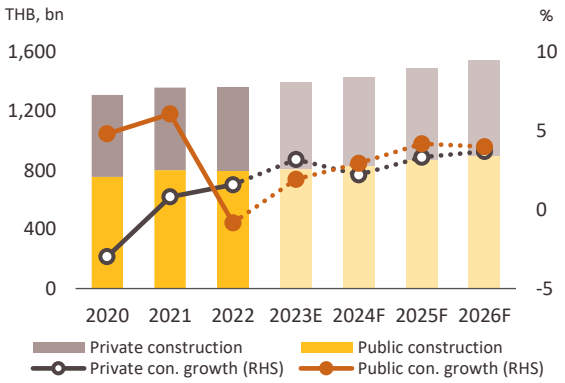
Source: OIE, forecast by Krungsri Research

Construction Materials (Cont.)

2024-2026 Outlook (cont.)

- **Exports will tend to improve** as neighboring countries (Thailand's main export markets) reopen, and as governments increase spending on infrastructure, sales of cement and construction steel will rise. Exports of tiles and sanitarywares will benefit from revival in the real estate market, and in particular by increased demand from Chinese buyers for residential and commercial properties in neighboring countries.
- **Prices for construction materials will tend to strengthen** on: (i) greater demand from the construction industry, especially for use in residential developments; (ii) price rallies on global markets that will lift the cost of imports (e.g., of scrap and billet); and (iii) higher energy costs.
- **Traders:**
  - **Modern trade outlets should see gradual growth in income,** helped by the rising consumer preference for retailers that offer a comprehensive range of products. In the coming period, players will secure their market position by adjusting their business strategies, in particular by: (i) opening smaller outlets that will allow retailers to distribute into individual communities more effectively; (ii) partnering with manufacturers to open new types of outlet that target particular consumer groups more tightly; (iii) increasing the share of own-brand product lines, which will then cut costs and increase margins; (iv) exploiting new technology more effectively, for example making greater use of robotics for inventory management and better meeting consumer needs by developing new distribution channels that extend players' online presence and use of mobile applications; and (v) investing in new branches in second-tier secondary provinces and, to meet anticipated growth in demand, across the ASEAN region.
  - **Traditional outlets will have to face conditions that will remain depressed, and overall business growth will be very limited. (i) For wholesalers,** the market will remain flat or perhaps expand slightly, though players will have to contend with escalating competition from both modern trade operators and manufacturers that are distributing directly to contractors. **(ii) retailers** are overwhelmingly small operations, of which there is a large number, and these face limitations in terms of their access to capital. As such, stock displays are typically unappealing, old-fashioned, and limited in scope compared to modern trade outlets, which now pose a significant threat. Traditional retailers are also hampered by their reliance on lower-income customers, who have been disproportionately affected by recent turbulence in the economy (i.e., rising unemployment, and wage and salary cuts). Given this, the outlook is for conditions to remain unfavorable.

Figure 3: Investment in Construction



% YoY	2022	2023E	2024F	2025F	2026F	2024F-2026F
Public	-0.8	1.5-2.5	3.0-3.5	4.0-4.5	4.0-4.5	3.5-4.0
Private	1.6	2.5-3.5	2.0-2.5	3.0-3.5	3.5-4.0	3.0-3.5
Total	0.2	2.0-3.0	2.5-3.0	3.5-4.0	4.0-4.5	3.0-4.0

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

Steel

HRC (Hot-rolled coil)

Situation in 2023

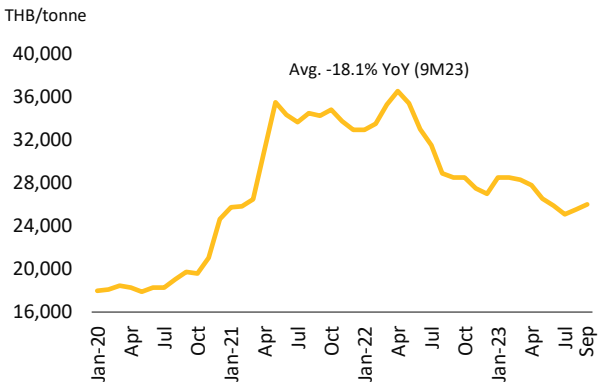
- **Production of hot-rolled coil crashed -20.2% YoY over 9M23 to 1.4m tonnes.** Demand from both domestic and export markets was depressed through the period, while imports also stole market share from Thai manufacturers. Thus, overall imports of hot-rolled coil were up 9.8% YoY, and while imports from Japan inched up 2.5% YoY, those from China jumped 76.0% YoY. **For the year, output of hot-rolled coil is expected to be down by between -17.0% and -19.0%.**
- **Demand slipped -2.0% YoY to 4.3m tonnes in 9M23.** Declines were driven by a slowdown in automobile production, and with chip shortages periodically disrupting production and credit terms tightening (thereby impacting sales of pickup truck) output inched up by just 1.6% YoY, down substantially from 2022's growth of 11.7%. Demand was also undercut by sluggish markets for electrical appliances and metal tins/cans, for which MPIs contracted by respectively -6.7% YoY and -19.5% YoY. **Total 2023 consumption of hot-rolled coil will therefore remain flat or contract slightly by 0 to -1.0%.**
- **Exports slumped -45.9% YoY to just 23,000 tonnes** on a poorer economic outlook in Vietnam and Myanmar, responsible for respectively 35% and 5% of all exports.
- **Prices** averaged THB 26,911/tonne in the period, down -18.1% YoY due to weak demand on global markets that was then mirrored domestically in 9M23. **For all of 2023, prices are expected to be down by between -14.0% and -16.0% relative to the 2022** average of THB 31,550/tonne, though they should remain in the range of THB 26,000-28,000/tonne

Table 1: Hor-rolled Coil (HRC) Production and Apparent Use

	2020	2021	2022	9M22	9M23
Production (tonnes, m)	2.4	2.8	2.3	1.8	1.4
% YoY	-7.9	16.9	-18.4	-17.3	-20.2
Apparent Use (tonnes, m)	5.2	6.9	5.7	4.4	4.3
% YoY	-20.5	33.8	-18.0	-17.6	-2.0

Source: Iron and Steel Institute of Thailand (ISIT)

Figure 1: HRC Prices

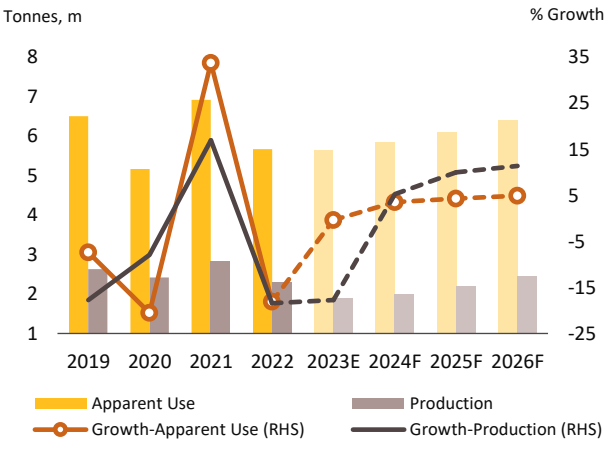


Source: ISIT

2024-2026 Outlook

- **Production is expected to stay level or expand at a slow pace of 0.0-1.0% annually** (after a contraction in 2023). Although demand is anticipated to improve, manufacturers will continue to feel pressure from an expansion in the volume of imports. This is because Thailand lacks upstream iron and steel production, which then adds to domestic production costs and increases the risk that Thai manufacturers will lose market share to overseas suppliers. Chinese imports pose a particular problem since recent improvements to production processes have increased the quality of low-cost products.
- **Demand is forecast to strengthen** by 4.0-5.0% per year to around 6m tonnes annually. Manufacturers of electrical appliances and automobile assemblers will remain the main drivers of demand, and as the economy grows and purchasing power strengthens, these will enjoy an improving outlook, with knock-on consequences for manufacturers of hot-rolled coil. In addition, supply chain disruptions in the automobile industry will be loosen, further lifting demand. Exports will also grow, albeit slowly, on firmer demand from downstream industries in overseas markets
- **Prices will likely soften further under the influence of global markets, although declines will be limited and prices will remain high.** Global steel prices may also be affected by additional cost pressure arising from the need to adapt to the CBAM measures and to reduce steel products' embodied carbon. This will then influence prices on the domestic market.

Figure 2: HRC Production and Apparent Use Forecast



Source: ISIT
Note: Forecast by Krungsri Research

Steel (Cont.)

Steel Bar and Section

Situation in 2023

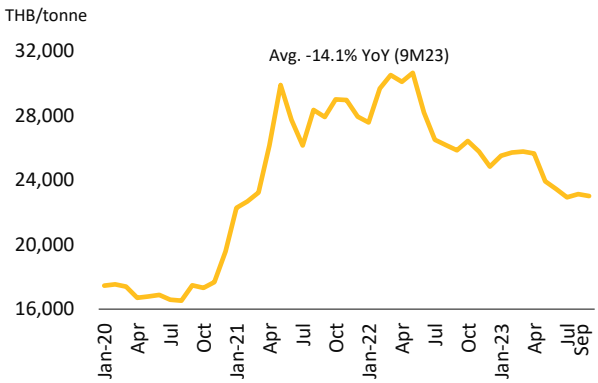
- **Output rose 6.9% YoY to 2.9m tonnes over 9M23** on an increase in work on construction projects, the main market for steel bar and section, and **for the year as a whole, combined production of both types of steel is forecast to expand by 5.5-6.5%.**
- **Demand for bar and section jumped 14.2% YoY to 3.1m** tonnes through the same period. The market was boosted by an uptick in activity in the construction sector, especially by the 9M23 2.5% YoY increase in spending on public-sector construction, most of which went to ongoing projects that are major consumers of steel. However, demand for bar and section will likely soften in the remainder of 2023 as growth in spending on construction by both the private and public sectors slows, especially for some infrastructure projects that may be delayed due to awaiting clearer government budget policy. **Overall 2023 demand is thus expected to increase by 10.0-12.0% to 4.0m tonnes.**
- **9M23 exports of steel bar slipped -6.8% YoY to 0.16m tonnes** on weakness in major overseas markets, in particular in Canada (Thai exporters' 4th most important export target), where a -86.6% YoY as Thailand lost market share to other competitors e.g. UAE, Brazil, and India, from where Canada imports increased by 69.1% YoY, 122.8% YoY, and 140.7% YoY respectively. Exports of steel section also did badly, and the -21.2% YoY and -52.2% YoY decline in distribution to respectively Myanmar and the Philippines pulled total exports down by -29.0% YoY to 0.23m tonnes. However, an increase in domestic construction supported jumps of 10.6% YoY and 20.8% YoY in imports of steel bar and steel section, respectively.
- **Average domestic prices for bar and steel declined -14.1% YoY to THB 24,346/tonne in 9M23,** moving with world prices that were affected by global uncertainty and depressed conditions in the Chinese real estate market. Prices will likely continue to soften through the rest of 2023 and so for **the year overall, these are expected to drop by between -13.0% and -14.0%.**

Table 1: Steel Bar/Section Production and Apparent Use

	2020	2021	2022	9M22	9M23
Production (tonnes, m)	3.6	3.6	3.6	2.7	2.9
% YoY	-13.3	0.6	1.6	2.3	6.9
Apparent Use (tonnes, m)	3.7	3.8	3.6	2.7	3.1
% YoY	-15.7	1.6	-4.3	-4.0	14.2

Source: Iron and Steel Institute of Thailand (ISIT)

Figure 1: Domestic Steel Bar Prices

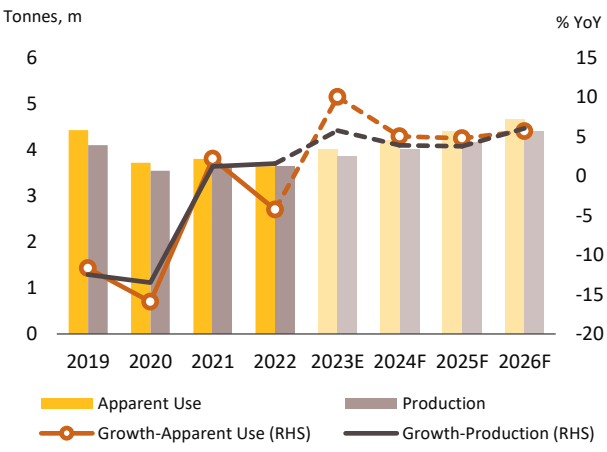


Source: ISIT

2024-2026 Outlook

- **Over the next 3 years, production is forecast to expand by 4.0-5.0% annually. This will bring output to 4.0-4.3m tonnes per year, in line with anticipated growth in annual demand of 5.0-6.0% (or to 4.0-4.5m tonnes**). The market will be lifted by: (i) an acceleration in work on new and ongoing government megaprojects (in line with the 2023-2027 action plan); (ii) recovery in private sector real estate construction, now that purchasing power is recovering and the supply glut is beginning to clear; (iii) an increase in work on industrial estates in the EEC that will be driven by an expansion in investments in the area; and (iv) the rebound in the tourism sector and the resulting need to renovate existing hotels and to construct new premises. Nevertheless, strong competition from low-cost imports from China will restrict growth in production and sales.
- **Domestic prices for steel bar and section will tend to soften** on the falling cost of inputs, in particular of scrap (down -19.6% YoY in 9M23). However, declines will be limited by increasing geopolitical risk in the Middle East and the imposition of the CBAM measures, which will require manufacturers to reduce the carbon intensity of their products, thereby adding to costs.

Figure 2: Steel Bar/Section Production and Apparent Use Forecast



Source: ISIT
Note: Forecast by Krungsri Research

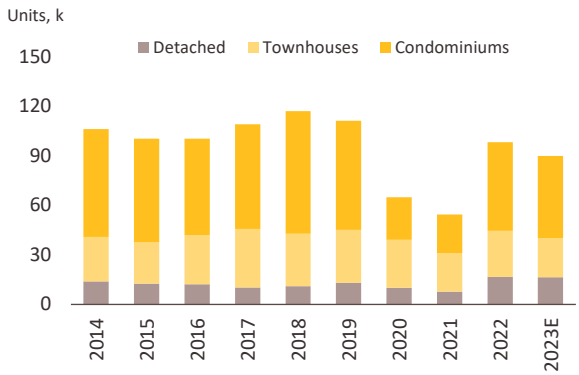
REAL ESTATE

Housing in BMR

Situation in 2023

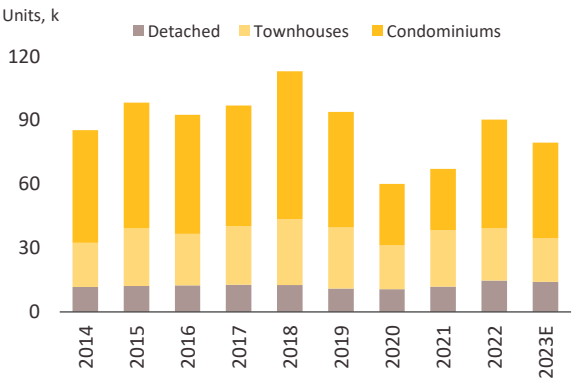
- **The housing market[1/] came under pressure through 9M23** from a combination of the impact of economic sluggishness on purchasing power, rising interest rates, and the increase in household debt to a 15-year high of 90.6% of GDP. As a result, the purchasing power for residential properties decreased, reflected in **sales of new units** slumping -44.3% YoY to 15,758 units. **The total sales (new + existing units)** also fell -19.9% YoY to 43,192 units (over 1H23), while **the number of new housing units** was down -14.4% YoY to 62,219 units. As a result of the large expansion in supply in 1H22, the number of new townhouses and condominiums contracted by respectively -18.6% YoY and -17.2% YoY, though for detached houses, the supply of new units increased 3.1% YoY.
- **Demand is expected to firm up in the remainder of the year,** helped by the continuing strength of real demand from owner-occupiers with strong purchasing power and the termination at the end of 2023 of cuts to the fees for registering mortgages and transferring ownership. In addition, demand will be lifted further by the onset of the travel high season and the New Year celebrations, which will boost the tourism sector (7-8m foreign tourists are expected in Q4, or a third of all 2023 arrivals) and add to demand from overseas buyers. Developers are focusing on launching properties at the upper end of the market for revenue recognition, **but for all of 2023, the total sales will fall by -12.0% YoY, while the number of new units coming up for sale will contract by -8.5% YoY.**
- **House prices[2/] rose through 9M23,** the index of condominium prices climbed 4.8% YoY. For detached houses and townhouse, the index rose by 4.1% and 4.0% YoY, respectively. **For the year, prices will continue to increase,** driven by rising land prices and development costs (i.e., construction materials and labor), and this will push up property prices by 5-10% YoY.

Figure 1: New Launched



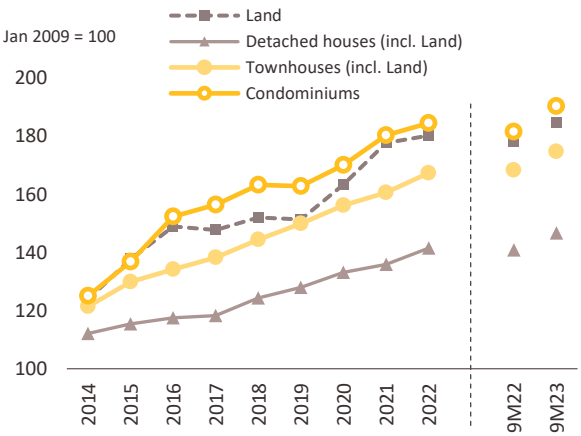
Source: Agency for Real Estate Affairs (AREA), Krungsri Research

Figure 2: Units Sold



Source: AREA , Krungsri Research

Figure 3: Housing Price Index



Source: Bank of Thailand (BOT)
Note: Housing price index was calculated from 17 commercial banks which are registered in Thailand and located in BMR.

1/ Total housing projects include detached houses, townhouse, condominium.

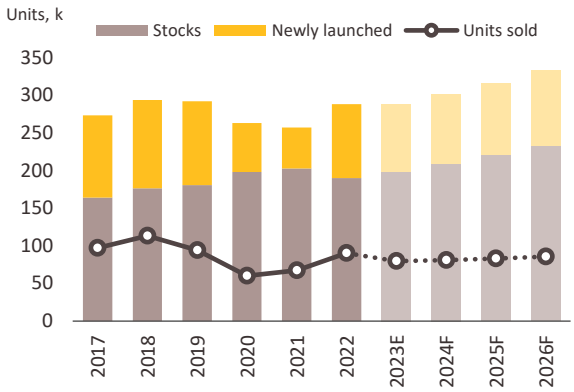
2/ The housing price index is constructed from the prices for detached houses, townhouses and condominiums, for which data are collected from information on housing loans provided by 17 lenders active in the Bangkok Metropolitan Region.

Housing in BMR (Cont.)

2024-2026 Outlook

- **Sales will gradually pick up by 2.0-3.0% per year** on: (i) ongoing government spending on infrastructure, especially in transportation infrastructure, will increase the demand for housing along metro lines and in areas accessible by metro lines; and (ii) recovery in the tourism industry (arrivals are forecast to return to their pre-Covid level by 2025), which will boost demand from overseas buyers. On the supply side, **the number of new units will grow by 3.0-4.0% per year,** most of this will come from major developers that are on a strong financial footing and will be in projects with a limited number of units. The outlook for the main market segments is given below.
  - **Low-rise housing (detached housing and townhouses): The sales of detached houses continue to strengthen,** especially at the upper end of the market for properties in areas close to international schools or that are in the north and east of Bangkok (near New Krungthep-Kreetha Road). **For townhouse, sales are showing a stable trend** due to a relatively high remaining supply, while buyers are typically mid- to lower-income earners, and these have been more seriously affected by rising interest rates and the high debt burden. These thus have lower purchasing power, and although **large developers will be able to maintain growth momentum, SME developers will have to contend with intense competition on the costs of both construction and financing**.
  - **Condominiums: Supply will respond to stronger demand from long-term investors since**, as a result of rising oil prices and the overall increase in the cost of living, renters are increasingly favoring condominiums. **Demand from non-Thai buyers looking to acquire a second home** as a personal hedge against rising geopolitical tensions will also add to demand for units in downtown locations. However, the demand for condominiums in suburban areas continues to lag behind low-rise developments, while in some locations (e.g., Phet Kasem, Chaeng Watthana, Nonthaburi, and Bang Na), the market is still struggling under a supply glut.
- **Challenges to the market that will need to be tracked closely** will include: (i) the high level of household debt, which will likely remain elevated, encouraging lenders to tighten credit conditions; and (ii) the only slow recovery in purchasing power for low- to middle-income buyers, which has resulted in a significant oversupply of properties in some areas. In addition, as Thailand transitions to an aged society, demand will likely weaken further, while younger buyers (especially gen Z) tend to prefer renting to buying[3/].

Figure 4: Total Supply



Source: AREA, Forecast by Krungsri Research

3/ Source: "ttb analytics assessment of the contracting market for condominiums in the BMR", ttb analytics.

Housing in Upcountry (6 major provinces[1/])

Situation in 2023

- **The housing market battled through sluggish conditions in 1H23,** and sales struggled against the weight of only patchy and incomplete domestic economic recovery, the run-up in interest rates, and the rise in household indebtedness of over 90% of GDP. This then drained purchasing power from the market, and as such, **sales slumped -28.8% YoY,** split between declines of -35.2% YoY for low-rise units and-13.4% YoY for condominiums. Nevertheless, **the supply of new housing units jumped 28.4% YoY.** Growth in supply was led by condominiums, which surged 135.0% YoY. This was largely a result of the rebound in the tourism sector and the influx of foreign buyers, and so new units were concentrated especially in Phuket and Chonburi, while the supply of new low-rise were down -8.2% YoY. **Transfers of ownership were also up 4.9% YoY by unit and 16.3% YoY by value.** The market benefited from spending by wealthier overseas buyers looking to invest in Thai property or to purchase second homes. Again, by both number and value. Around 40% of these transfers were made in Chonburi, which benefits from being a center of both tourism and business/ industry and has strong purchasing power.
- **Demand will strengthen slightly through 2H23** on ongoing growth in the tourism sector and the expiry at the end of the year of cuts to the fees charged for registering mortgages and transferring ownership. **For the year as a whole, sales will thus be down by some -25.0%, though the supply of new units should increase by 4.2%.**

2024-2026 Outlook

- **Sales will rise by 3.0-5.0% annually,** helped in general by these provinces with potential in various aspects, such as tourist destinations, industrial hubs and regional centers. Markets will be lifted by: (i) domestic economic growth of 3.0-4.0% that will then add to buyers' purchasing power; (ii) government spending on infrastructure, e.g., the high-speed rail-link connecting Bangkok's 3 airports; (iii) the rebound in the tourism sector (arrivals are expected to hit 43m by 2026), which will bring additional foreign buyers into the market; and (iv) less intense competition than in Bangkok and nearby areas, greater access to land for development, and lower prices for this[2/].
- **Developers will continue to bring new projects to market.**
  - **Low-rise housing: The new housing units will expand at an average annual rate of 5.0%** as developers look to meet rising demand from real demand group and buyers hunting for second homes, who are typically mid- to upper-income earners. However, major developers will increasingly switch their attention to regional markets, and as competition intensifies, local SMEs will see profitability come under pressure
  - **Condominiums:** Growth will lag behind that of the low-rise market. However, condominiums continue to remain a favorite of investors and overseas buyers, who see the market for provincial condominiums providing good value and solid returns. **The supply of new units should expand by around 4.0% per year.**

Figure 1: New Supply in 6 major provinces

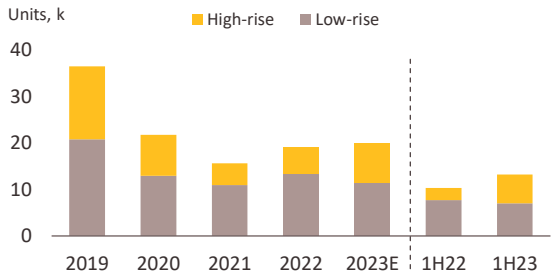


Figure 2: Units Sold in 6 major provinces

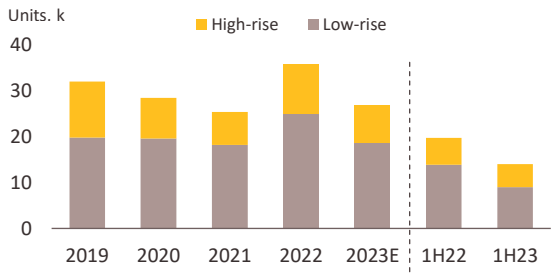


Figure 3: Housing Transferred in 6 major provinces

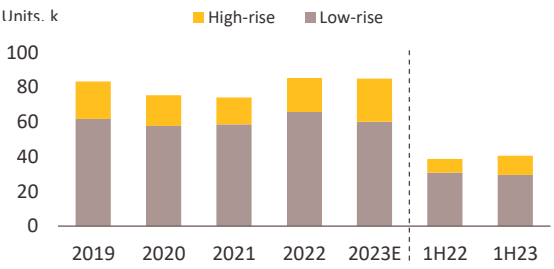
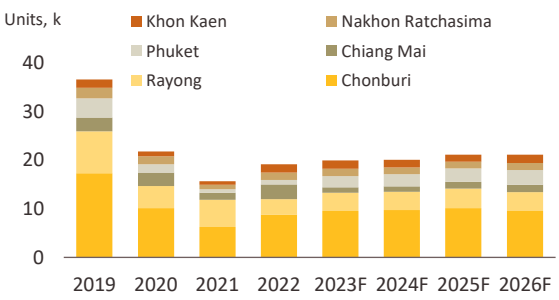


Figure 4: New Supply Forecast



Source: Real Estate Information Center (REIC), Krungsri Research
Note: *Low-rise housing includes detached houses, duplex, townhouses and shophouse. High-rise is condominium.

1/ The 6 provinces are Chiang Mai, Chonburi, Khon Kaen, Nakhon Ratchasima, Phuket, and Rayong.
2/ Real Estate Information Center (REIC)

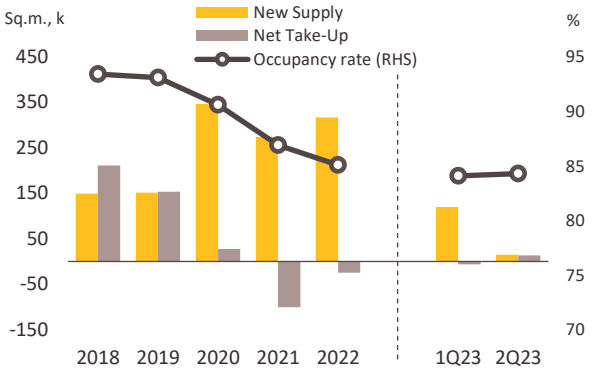
Commercial Buildings in BMR

Office Buildings

Situation in 2023

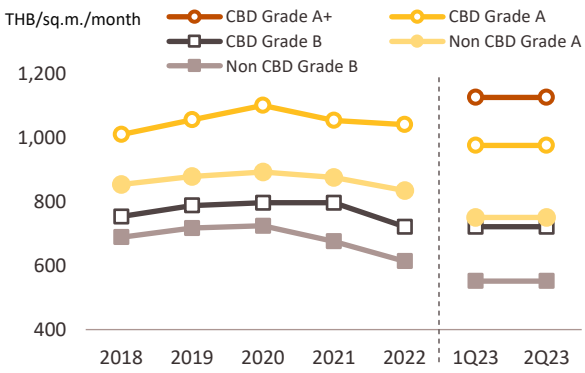
- The supply of new office space grew by 134,750 sq.m. in 1H23, bringing overall supply to 9.4m sq.m.[1/], and of this, the total occupied space came to 7.9m sq.m. The net take-up rate[2/] improved in Q2, with Q1's contraction of -5,961 sq.m. turning into growth of +13,568 sq.m. Tenants have typically been businesses connected to consumer goods, co-working spaces, and online marketing operations, and these have taken on leases for space in and near to the CBD that is easily accessible but where rents are not excessive. In the period, the occupancy rate slipped to 84.3%, down from 86.7% in 1H22.
- Domestic economic growth will support a positive outlook for office space for rent through 2H23. **For all of 2023, new supply is expected to come to 270,000 sq.m.** as new projects are completed, especially in the CBD, but the continuation of hybrid working patterns will mean that **demand will expand by just 66,000 sq.m.** The occupancy rate will therefore slide, and **this is expected to drop from 85% in 2022 to 83% in 2023.** Moreover, as the excess supply of office space builds, rents will tend to soften slightly, though this will particularly affect grade-A office building over 15 years old.

Figure 1: New Supply Net Take-Up and Occupancy rate



Source: CBRE Research, Krungsri Research

Figure 2: Rental Rates of Office by Area & Grade

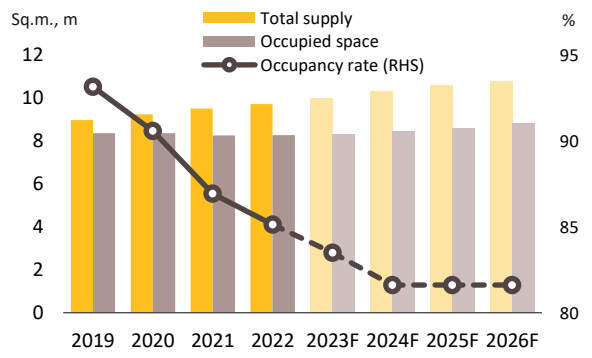


Source: CBRE Research, Krungsri Research

2024-2026 Outlook

- **Demand for office space for rent will rise by 1.5-2.0% per year** over the next 3 years, down slightly from the 2.5% average growth seen over pre-Covid period, 2015-2019, a steady expansion in the economy will support an uptick in business activity and stronger demand for office space. Tenants, and especially overseas companies, are increasingly in the market for 'green offices' that have been built in accordance with the renter's ESG goals or in line with international standards (e.g., the LEED standards, other certifications that affirm that the building meets energy-saving and other environmental or health benchmarks, or that it is fully digitally connected). This allows developers to set higher rental rates and provides the opportunity a more rapid return on investment compared to regular offices. Therefore, it is expected that the demand for rental offices will continue to increase consistently to accommodate the recovering business needs in the future. **The new office supply is projected to increase by an average of 2.6% per year, or about 800,000 square meters. Meanwhile, the occupancy rate will slip to 82%,** which may create pressure on rents in some locations as tenants gain more negotiation power, limiting the potential for rent increases.
- **Income growth will depend on location, as follows.**
  - **Office space in the CBD:** Income will continue to rise, especially for A-Grade buildings due to modern design, advanced technological systems, and effective management systems. This leads to steady demand, even with higher rental prices compared to other areas.
  - **Office space in non-CBD areas or locations near Bangkok:** Income will remain flat or slightly decrease due to a relatively high supply, mainly consisting of Grade B buildings, leading to intense competition. Therefore, there is limited potential to increase rental prices significantly.

Figure 3: Office Space in the BMR



Source: CBRE Research, forecast by Krungsri Research

1/ CBRE Research adjusted its database in Q1 of 2023 to exclude home offices and buildings owned by government. This adjustment may result in discrepancies when comparing data with the same period of the previous year.

2/ The net take-up represents the difference between new occupied space and rented space that the tenants terminated in that year (square meters).

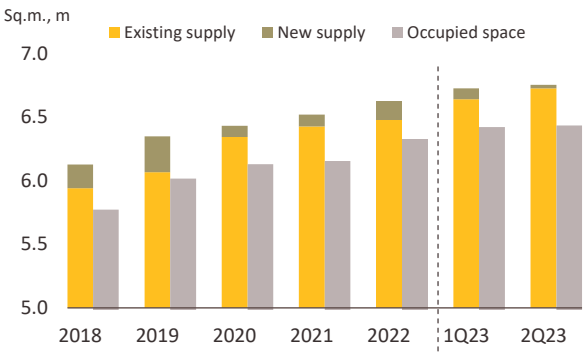
Commercial Buildings in BMR (Cont.)

Retail Space

Situation in 2023

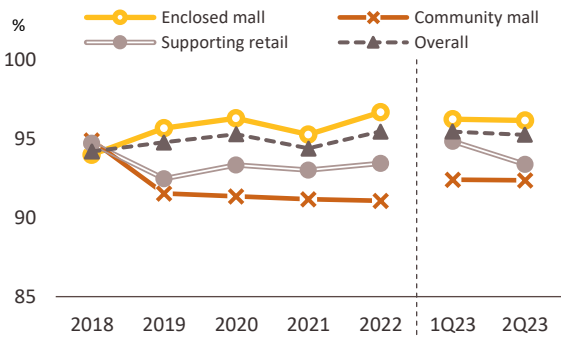
- **Over 1H23, the recovery in the tourism sector provided a boost to retail business.** This resulted in the demand for retail space reaching 6.4m sq.m., an increase of 1.7% from the end of 2022, while the total supply of retail space rose 1.9% YTD to 6.8m sq.m., partly as a result of renovated space returning to the market. In particular, the supply of supporting retail space jumped 16.8% YTD, and the slight discrepancy between growth in supply and demand pulled the occupancy rate down from 95.5% at the close of 2022 to 95.3% at the end of June 2023.
- **Demand for retail space will continue to strengthen through 2H23,** driven by the purchasing power of international tourists (expected to be around 14.8m). This will be particularly important for sites in the CBD, most of which are in large shopping malls. Meanwhile, domestic purchasing power is recovering within limitations. Developers will also likely move forward with expansion plans, and **so across 2023, the supply of new retail space will expand by approximately 0.3m sq.m. (up 4.8% YoY), while demand will likely increase by 4.0% to around 0.25m sq.m. The occupancy rate is expected to stabilize at 94.7%.**

Figure 1: Existing & New Supply and Occupied Space



Source: CBRE Research, Krungsri Research

Figure 2: Occupancy Rate by type

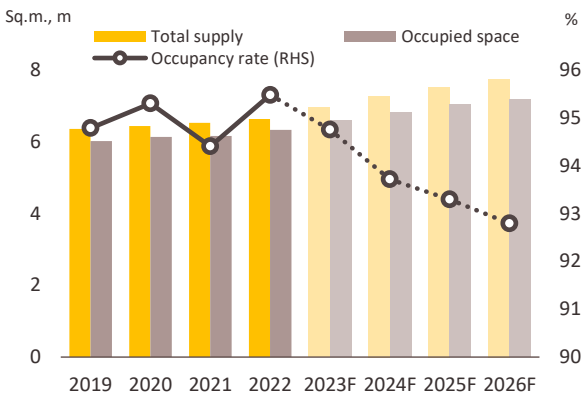


Source: CBRE Research, Krungsri Research

2024-2026 Outlook

- **The outlook will remain positive for retail space in the coming period, with demand expanding at an average annual rate of 2.4-3.6%** thanks to: (i) private sector consumption expanding with the economic recovery; (ii) government spending on transportation infrastructure that will trigger an expansion in urban communities, thus attracting investment in new retail space; and (iii) a return to the purchasing power of overseas tourists to its pre-Covid level by 2025. Alongside this, developers will continue to invest in both the renovation of existing sites and the construction of new space, although work on some projects has run behind schedule (especially for larger shopping malls). **The supply of new retail space is therefore expected to increase by 3.7% annually, which would bring the occupancy rate down to an average of 93.3%.**
  - **Enclosed malls:** Income will continue to strengthen, especially in CBD that are favored by major Thai and international brands. Supply will tend to expand in both downtown and suburban areas, driven by the expansion of residential areas (e.g., in Rangsit and Bang Na). The majority of new investment will be in large shopping centers, and this will push up rents, in particular for sites in the CBD.
  - **Community malls:** Income will likely remain flat given expanding supply. New developments do not carry prohibitively high price tags and it is relatively easy to find sites suitable for development, especially in areas further out from the city center such as Rangsit, Chaeng Watthana, and Lat Krabang. However, community malls generally target mid- and lower-income consumers whose spending power is expanding slowly, and so growth in demand will lag behind that of supply. It will thus be difficult for operators to raise rents.
  - **Supporting retail:** Income growth will remain flat due to the large expansion in supply, especially in downtown areas where many mixed-use projects will be completed. This will happen alongside growth in demand that emphasize modern designs and convenient transportation. As a result, rental prices are expected to stabilize with a slight increase.

Figure 3: Retail Space in BMR



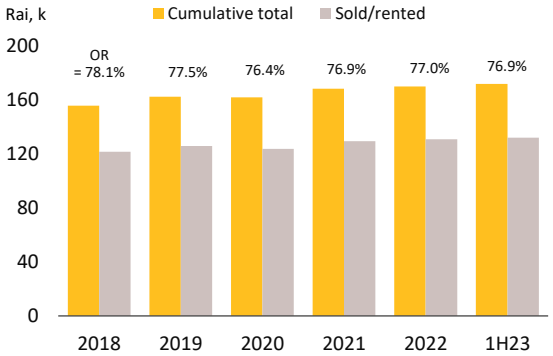
Source: CBRE Research, forecast by Krungsri Research

Industrial Estate

Situation in 2023

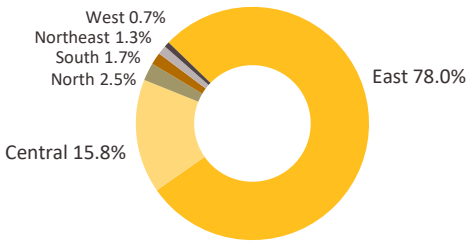
- **New sales and leases of land on industrial estates surged 210.4% YoY to 1,844 rai in 1H23** as the pandemic eased and global investment flows came back to life, though in the eastern region (responsible for 87% of all new sales and leases), the market expanded by a full 334.2% YoY to 1,598 rai. The largest source of international investment was Japan (31% of the total), followed by China (12%) and Singapore (8%), while by industrial activity, the most important areas were autos and transportation, steel and metal products, rubber and plastics products.
- **One new industrial estate was established in 1H23,** the 1,547 rai Nong Lalok Industrial Estate in Rayong Province. This reflects the continuing potential of the EEC to attract new investment inflows, and in fact, the value of applications and approvals for BOI investment support for projects in the EEC increased by respectively 64.1% YoY and 87.8% YoY in the period. **This then brought the total number of industrial estates to 68 (as of 1H23). These are spread across 16 provinces and cover a total area of 172,000 rai**. These are most heavily concentrated in the East, which is home to 78.0% of the total. At present, 76.9% of the space on Thailand's industrial estates (132,000 rai) has been leased or sold.
- **Demand for land to lease and sales on industrial estates will be boosted through 2H23** by expansion of investment, and so for all of 2023, new sales and leases are expected to increase by 32.2% to 4,500 rai.

Figure 1: Cumulative Total and Area Sold/Rented on Industrial Estates



Source : Real Estate Information Center (REIC)

Figure 2: Industrial Estate Area, by Region (1H23)



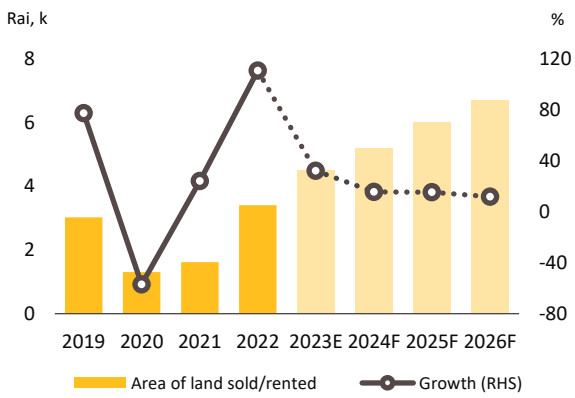
Source: REIC

2024-2026 Outlook

Over the next three years, annual sales and leases are predicted to expand by 10.0-15.0% per year to 5,000-7,000 rai. The market will be boosted by: (i) a stronger global economy and improving sentiment among foreign investors, which will help to lift Thai exports even as these come under pressure from potentially worsening geopolitical tensions; (ii) the tendency among leading global manufacturers to reduce risk by dispersing their production bases, and because Thailand is one of the ASEAN zone's leading targets for this, the country will likely benefit from additional FDI; and (iii) government spending on new infrastructure, especially in the EEC, where progress will accelerate. Operators of industrial estates will tend to develop 'smart parks' that are equipped with new manufacturing technologies and modern transport, communications and energy systems. In addition, players will respond to government efforts to shift to the bio-circular-green (BCG) economy and to meet rising demand from new target industries by developing environmentally friendly industrial estates.

- **Eastern region:** Demand for space on these will expand rapidly thanks to government spending on new infrastructure in the EEC, and so income will increase more rapidly than in other parts of the country. However, rising land prices and limited access to suitable plots will mean that growth in supply (in both new and existing sites) will be only limited.
- **Central region:** Industrial estates in the central region will continue to benefit from their access to communication networks, and so demand will strengthen further. Income will thus rise, especially from leases and the provision of utilities.
- **Other regions:** Demand for space to buy or lease will remain weak since industrial estates outside the eastern and central regions are still waiting for the government to take action to stimulate investment by the private sector. This applies in particular to investment in the special economic zones in the North, Northeast, Centre/West, and South (these cover 16 provinces) and in large-scale projects to connect communication networks to the major economic areas. Given this, income for operators in these areas will only grow slowly.

Figure 3: Sold/Rent Industrial Estate Area Forecast



Source: REIC, forecast by Krungsri Research

HOSPITALITY

Hotels

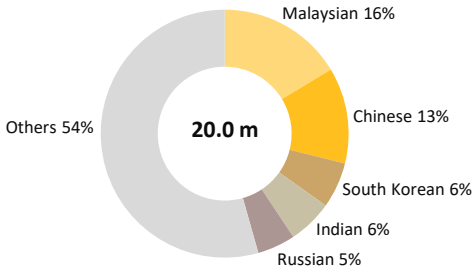
Situation in 2023

- **20.0m foreign arrivals were recorded in 9M23,** up from 5.7m in 9M22. This growth was helped by: (i) the move by the Chinese authorities to relax controls on outbound tourism from the start of the year; and (ii) the rebound in the Malaysian market, which benefited from Thailand's low costs relative to other destinations. However, arrivals are still only 67% of their 9M19 level of 29.5m. The most important source of arrivals was Malaysia, with 3.3m tourists (111% of 9M19 arrivals), followed by China with 2.5m tourists (29% of the 9M19 level), and South Korea with 1.2m arrivals (86%). Through the same period, the large number of 3-day holidays and phase 5 of the We Travel Together program (from March 7 to April 30, 2023) helped to stimulate the domestic market, and so in 9M23, Thai tourists made a total of 128.2m domestic trips (up 23.3% YoY).
- **Occupancy rates rose from 43.1% in 9M22 to 67.8% in 9M23,** though this was still below 9M19's 71.2%. Room rates also jumped 44.4% YoY, pushing up RevPAR by 127.9% YoY to THB 973, compared to THB 1,224 in 9M19.
- **Over 7M23, nationwide applications for permits for the construction of new hotels contracted -22.2% YoY** to a total of 0.59m sq.m., though in Bangkok (17% of all applications made nationwide), the decline was -77.6% YoY. However, in Chonburi, applications increased 22.6% YoY as hoteliers planned for an expected additional demand from both the industrial and tourism sectors in EEC.
- **For the remainder of 2023, foreign arrivals should continue to strengthen,** helped by the introduction of visa-free travel for: (i) Chinese and Kazakh Arrivals between 25 September 2023, and 29 February 2024; and (ii) Indian and Taiwanese arrivals between 10 November 2023, and 10 May 2024. However, the Chinese economy remains troubled and so the impact of these measures may be limited, while growth will also be constrained by the fact that there are still fewer flights from China to Thailand than in 2019. Over the short term, the market will also be disrupted by the short-term impact from mass shooting in a Bangkok shopping center on 3 October. For all of 2023, a total of 27.7m foreign arrivals is expected (+148.4%), while Thai travelers are forecast to make 175m domestic trips (+16.2%). This will then lift the occupancy rate from 2022's 47.9% to 68.5%.

2024-2026 Outlook

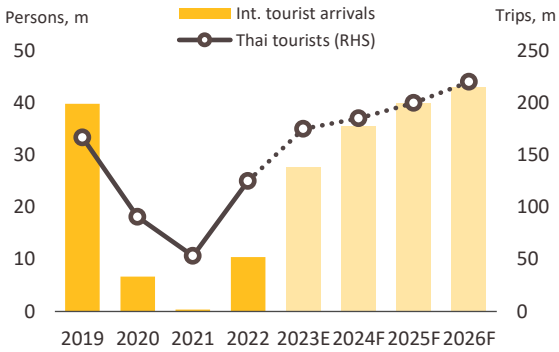
- **Conditions will continue to improve thanks to growth in foreign arrivals that is expected to hit 35.6m, 40m, and 43m over each of the next three years.** While geopolitical tensions will weigh on the market (most recently with fighting in the Gaza Strip), growth will be supported by: (i) gradual strengthening in the main markets, although in the case of China, unfavorable economic conditions will convince many potential tourists to travel domestically; (ii) the return of flight schedules to normal; and (iii) ongoing efforts by the government to promote tourism, for example by extending visa-free travel for Russian arrivals from 30 to 90 days (from 1 Nov.2023, to 30 April 2024). Likewise, the number of domestic trips should rise to 185m in 2024, 200m in 2025, and 220m in 2026, partly due to ongoing government measures to stimulate the market. Given this, the hotel occupancy rate is expected to rise to 70% in 2024, 72.0% in 2025, and 73.5% in 2026.
  - **Hotels in major tourist destinations (Bangkok, Pattaya, and Phuket): Income will rise rapidly** with the overall growth in the market, and given increasing arrivals, average occupancy rates may reach 80%.
  - **Hotels in tourist destinations and regional centers: Income will steadily strengthen** as the market expands and the government rolls out stimulus packages targeting the tourism industry.
  - **Hotels in other provinces:** Income will likely remain flat and occupancy rates will stay relatively low since these hotels generally serve as stop-offs for visitors en route to tourist areas or regional centers.

Figure 1: International Tourist Arrivals (9M23)



Source : Ministry of Tourism and Sports (MOTS)

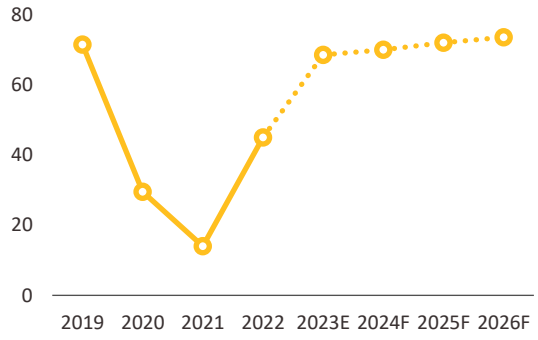
Figure 2: Tourist Numbers in Thailand



		2021	2022	2023E	2024F	2025F	2026F
No. of international tourists	%	-93.6	-2,493.0	148.4	28.5	12.6	7.2
No. of Thai tourists	%	-41.4	183.9	16.2	5.7	8.1	10.0

Sources : MOTS, BOT
Note: Forecast by Krungsri Research

Figure 3: Occupancy Rate (%)



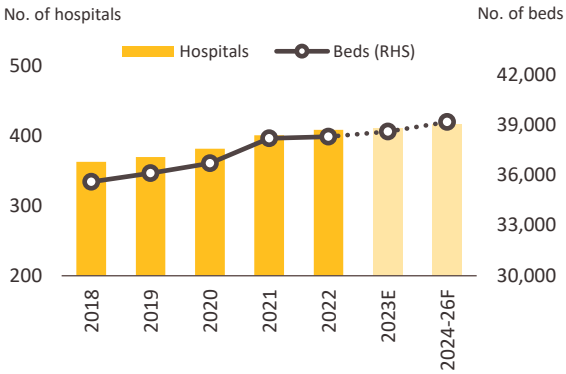
Sources : MOTS, BOT, Forecast by Krungsri Research

Private Hospitals

Situation in 2023

- **Income continued to grow over 9M23 thanks to a range of factors**. (i) The number of patients seeking treatment for general conditions increased, Covid-19 continues to be a problem, and rates of infection with seasonal illnesses (e.g., influenza and dengue fever) jumped by more than 90% YoY. (ii) Foreign patients have been returning to Thai hospitals in greater numbers, including in particular those coming from the Middle East and new markets in Saudi Arabia and Libya, medical tourists (foreign arrivals hit almost 20m), and Chinese patients seeking IVF treatment (payment for this is now covered by China's basic insurance). (iii) Social security payments have been increased from THB 1,640 to THB 1,808 per person per year.
- **For the remaining period of the year, it is expected that consumer purchasing power will continue to recover, driven by the growth momentum from the tourism sector,** while the number of foreign patients will climb with the increase in arrivals to 7-8m over the period. **For 2023, income for the industry should thus be up by 8.0-10.0% from its 2022 level.**

Figure 1: Numbers of Private Hospitals & Beds



Source : NSO, Forecast by Krungsri Research

2024-2026 Outlook

The income of private hospital businesses will continue to trend upwards by 9.0-10.0% annually over the next three years.

- **Demand for hospital services will strengthen on the following:**
  - **The share of the elderly in the Thai population (i.e., those aged 60 or over) will increase from 20.2% to 22.4% (source: NESDC),** adding to demand, especially for more involved treatments and procedures.
  - **Rates of non-communicable diseases (these account for around 75% of all deaths) will increase.** The number of foreign patients will also rise, with demand coming in particular from patients from the Middle East and the CLMV countries, while general growth in the tourism sector will also lift the number of medical tourists.
  - **Hospitals will tend to expand existing sites and/or open new branches.** They will also move into offering services such as telemedicine, and will focus more on health and wellness services, in line with emerging global megatrends.
  - **Major corporations:** These hospitals will see their income base broaden thanks to their ability to meet a wide range of needs and to offer advanced treatments in specialist centers. These also benefit from being part of extended commercial groups that are supported by a wide range of business partnerships.
  - **SMEs:** Meeting demand from patients paying through social security will help to stabilize income, but competition will be stiff and hospitals that are not part of wider commercial groups will face a challenging business environment.

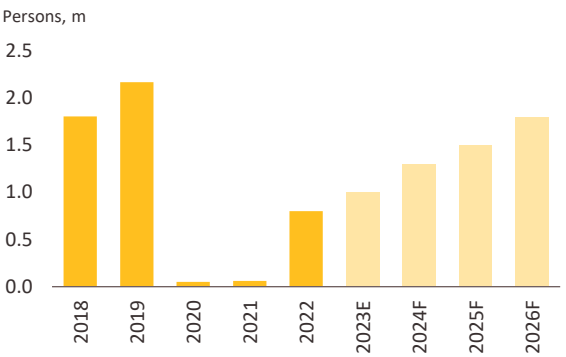
Figure 2: Proportion of Aging Population

% of population 65+ to total population

		2020	2040
Hyper-aged (20%)	Japan	29	34
Aged (14%)	South Korea	16	31
Aging (7%)	Singapore	15	30
	Thailand	13	26
	Vietnam	8	17

Source: United Nations (UN), Krungsri Research

Figure 3: Number of Foreign Patients in Thailand



Source: MoPH, Estimated and forecast by Krungsri Research

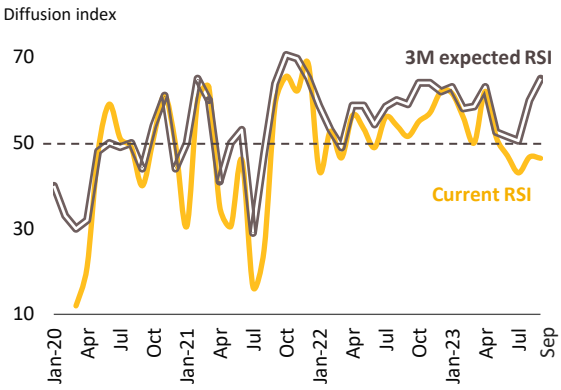
RETAIL TRADE

Modern Trade

Situation in 2023

- **During 9M23, retail sales improved steadily thanks to**: (i) the economic growth, and especially the rapid rebound in the tourism sector, boosting more spending in modern trade; and (ii) ongoing government stimulus measures, including the Shop and Refund scheme (January and February) and phase 5 of the We Travel Together promotion (March and April), as well as additional spending during the general election. As a result, consumer confidence has rallied, and in September this touched the 42-month high of 58.7. However, retailers remain concerned about the only limited recovery in spending power and the upward pressure on costs, and this is reflected in weakness in the Retailer Sentiment Index, which in July slipped to a 19-month low.
- **The outlook will continue to improve through the rest of 2023.** Spending will increase with the year-end celebrations, while the introduction of visa-free travel for visitors from China and Kazakstan (September 25, 2023, to February 29, 2024), and Indian and Taiwanese (November 10, 2023, to May 10, 2024) should help to lift arrivals to 7-8m (almost a third of the year's total), thereby boosting spending in tourist areas. **For the year overall, sales are thus expected to grow by 4.5-5.0%, matching 2022's growth of 4.5%.**

Figure 1: Retailer Sentiment Index (RSI)

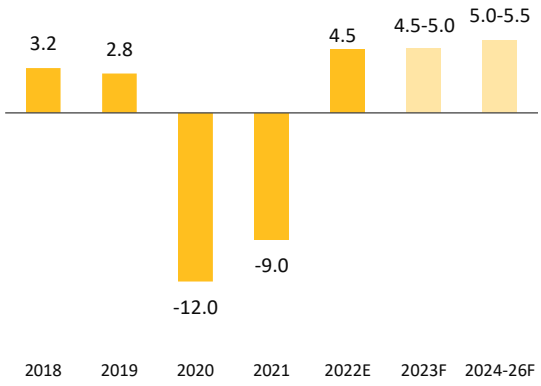


Source: Thai Retailers Association (TRA), Bank of Thailand of Thailand (BOT)

2024-2026 Outlook

- **Income is forecast to rise at an average annual rate of 5.0-5.5% on:** (i) domestic economic growth of 3.0-4.0% per year and the effects of this on consumer spending power; (ii) the increase in foreign tourist arrivals to 43m by 2026, adding further to purchasing power, especially in the major tourist areas; (iii) ongoing growth in e-commerce (Euromonitor sees Thai retail e-commerce expanding by 15.4% CAGR over 2024-2027); (iv) progress on the buildout of government infrastructure megaprojects, thus boosting employment and incomes and encouraging investment in new modern trade branches in areas where residential communities are expanding; and (v) growth in neighboring countries (the IMF sees the CLMV countries enjoying annual growth of 2.6-6.8%) that will lift retail sales in border regions. Players will also continue to expand their branch networks, develop their online presence, and diversify their business models as they build new income streams and target diverse consumer groups more precisely.
- **The outlook for individual segments is as follows.**
  - **Department stores:** Income will rise by 4.0-5.0% per year (+3.6% in 2023), as department store customers are mid to upper-income earners with stable spending power. Players will develop omnichannel platforms, improve the shopping experience by exploiting new digital technologies (e.g., AR), and open new outlets in high-potential areas (including in neighboring countries).
  - **Discount stores:** Income will rise by 3.0-4.0% per year (+2.0% in 2023) on mid- to lower-income consumers' gradually strengthening purchasing power. Players will also develop premium branches to attract wealthier customers.
  - **Supermarkets:** Income is up 6.0% in 2023, and because they appeal to consumers with strong purchasing power, supermarket income will rise by another 6.5-7.0% pa over 2024-2026. Operators will try to expand their market share by modernizing their branches and focusing more on high-end products (e.g., premium, health, and organic produce).
  - **Convenience stores:** Income growth will continue from 2023's 5.0% at a rate of 4.5-5.5% annually over 2024-2026. Players will benefit from their branch networks' almost complete national coverage and their move to develop online and delivery services, as well as the shift to selling a broader range of beverages and fresh food.

Figure 2: Modern Trade Retail Business Growth (%)



Source: TRA, Estimate and Forecast by Krungsri Research

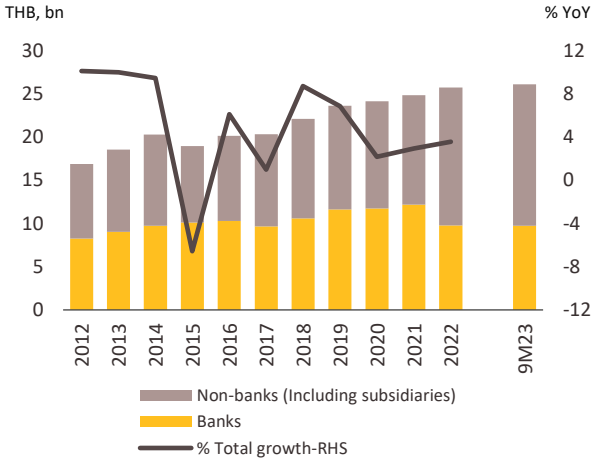
FINANCIAL SERVICES

Credit Card

Situation in 2023

- **Over 9M23, spending on credit cards jumped 19.1% YoY to THB 1.92 trillion, with outstanding balances up 29.5% YoY and the number of credit cards in use also rising 3.6% YoY.** The ending of the pandemic allowed economic and social life to return to normal, and with consumer confidence touching a 42-month high in September, spending bounced back from its Covid-era lows. Credit card issuers have also tried to maintain high levels of spending by targeting their marketing at high-income earners.
- **Spending on credit cards will continue to rise with Q4 year-end celebrations,** while recovery in the tourism sector and related industries will pull in a greater number of foreign arrivals. This will then give an additional boost to labor markets and income growth, thereby further lifting credit card use. However, household debt passed 90% of GDP in Q2, and this will limit growth in expenditure, and so for 2023 overall, credit card spending is expected to rise by 20.0-22.0% from its level a year earlier.

Figure 1: Total Number of Credit Cards Account[1/]

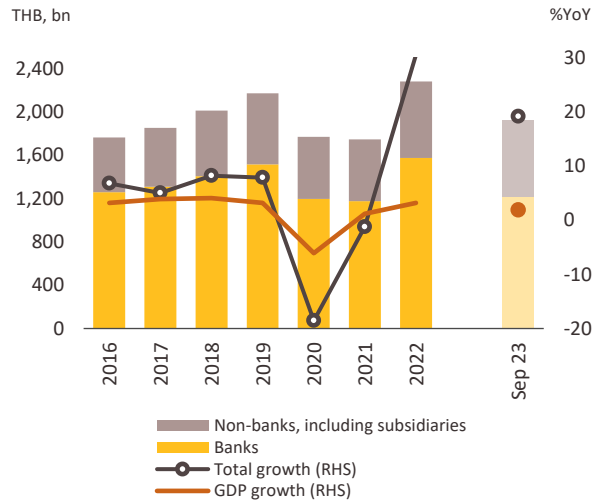


Source: Bank of Thailand (BOT), Krungsri Research
Note: BOT revised the data on commercial banks and non-banks because
1) non-bank credit card companies adjusted the number of non-moving accounts in December 2015
2) some commercial banks stopped providing certain types of credit card services in July 2016.

2024-2026 Outlook

- **Over the next 3 years, spending on credit cards will climb at an average rate of 14.0-15.0% per year.** Economic growth will stimulate greater business investment and consumer spending, with this benefiting further from the continuing recovery of the tourism sector and shifting consumer behaviors that are increasingly favoring electronic payment systems.
- **Issuers will be careful about expanding their customer base, and these will focus on attracting higher income consumers and those that have the potential to increase their spending.** At the same time, credit card issuers will try to reduce their exposure to risk, in particular from low-income customers or those whose income is growing only slowly and who are thus at an elevated risk of generating NPLs. Credit card companies will also release new products that target the needs of particular consumer groups, for example for spending on travel, health, or beauty.
- **Competition will tend to intensify in the coming period**, coming in particular from rapid, easy-to-use payment options such as mobile banking, QR codes, and e-wallets, as well as from the 'buy now, pay later' schemes popular on e-commerce platforms. Credit card companies will thus need to adapt rapidly to a changing environment by using modern technology (e.g., AI) to build competitive advantage and to make business processes as smooth as possible, from the application process through setting credit limits to managing risk.

Figure 2: Total Spending



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

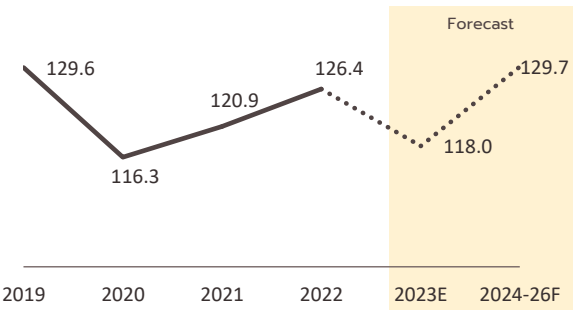
OTHER SERVICES

Mobile Communication

Situation in 2023

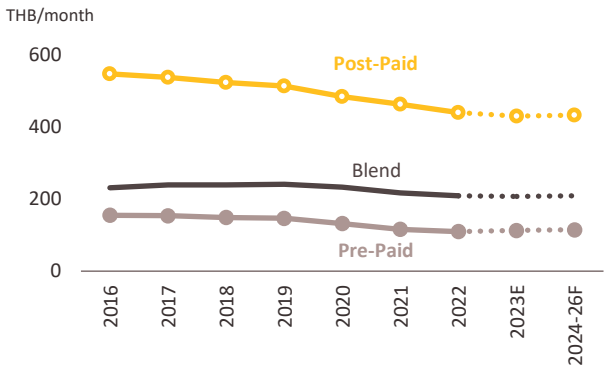
- **Income to telecoms providers edged up slightly over 9M23.** Operators benefited from domestic economic recovery that was led by the tourism sector, and with rising numbers of foreign tourists and migrant workers in the country, income from roaming charges and international calls rose. Income was lifted further by growth in receipts from business customers and the continuing rise in online business activity. Operators have also adapted their strategies by focusing on more targeted consumer groups, especially those with higher incomes, adding value by bundling packages together, and offering 5G solutions to companies in target industries. As a result, average revenue per user per month has risen by 2.0%-3.0%.
- Income will continue to strengthen through the remainder of 2023 as the tourism industry moves into its high season and Q4 arrivals reach 8m, adding to receipts from pre-paid customers. **For the year as a whole, income from service fees should increase by 1.0-2.0% from its level in 2022.**

Figure 1: Mobile Subscribers
(Million Persons)



Source: NBTC, Krungsri Research

Figure 2: Average Revenue Per User (ARPU)



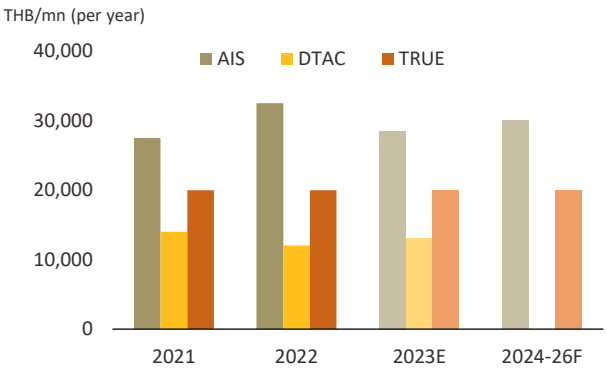
Source: NBTC

2024-2026 Outlook

The business environment will improve, but not dramatically, with incomes strengthening by 1.5-2.5% per year thanks to the following tailwinds.

- **Growth in demand for telecoms services will be driven by :**
  - **A steady increase in consumer spending power and the rise in tourist arrivals to 43m by 2025**, thereby widening the potential customer base, especially for pre-paid services.
  - **The increasing popularity of data services**, including for the consumption of online entertainment, using social media, and completing financial transactions and buying goods and services online, all of which will provide operators with opportunities to attract new customers and grow their income.
  - **Rising demand for 5G services as a vehicle for facilitating the digital transformation of businesses and industry**, e.g., by creating automated retail outlets, developing new digital health services, and allowing smart electronic devices to be integrated into day-to-day life.
  - **Government policies** (e.g., developing the digital economy, the smart city program, and the EEC) that are extending the country's telecoms infrastructure and stimulating demand from consumers in remoter areas.
- **Operators will continue to expand their 5G networks,** thus distributing the cost of fixed assets over a wider userbase. To secure long-term income growth, companies will also develop additional business services and extend their activities into areas typically regarded as falling within the scope of tech companies.

Figure 3: Investment Budget



Source : Compiled by Krungsri Research
Note: True-DTAC announced the completion of the business merger on March 1, 2023, and now operates under the name "True Corporation Limited (Public)."

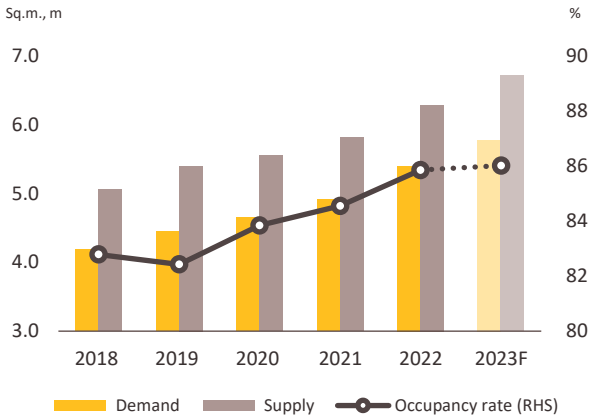
Logistics

Warehouse Space

Situation in 2023

- **Business conditions have improved** on: (i) an uptick in economic activity, led by the rebound in the tourism sector and growth in private-sector consumption (expected to reach 3.3% growth) that will feed additional demand for consumer goods; (ii) expansion in e-commerce (the Thailand E-commerce Association sees this running to 13-15% growth); and (iii) additional demand for space from some distributors that have increased imports from China while the economy there is sluggish. Nevertheless, exports are likely to contract -1.5% YoY this year and this will counterbalance some of the expansionary pressures in the industry, and **so overall 2023 demand is predicted to rise 7.0% from its 2022 level to 5.8m sq.m.**
- **Operators are responding to anticipated growth in demand** by steadily stepping up their investment in new warehousing space. Indeed, data from the BOI show that over 8M23, applications for investment support jumped 73% YoY across areas as diverse as food processing, the manufacture of medical devices, and the production of machinery and machinery parts. **The total supply of warehouse space has therefore increased 6.8% from 2022 to 6.7m sq.m., while the occupancy rate has remained almost unchanged, edging up from 85.9% to 86.0%.**

Figure 1: Supply, Demand, and Occupancy Rate



Source: WHART, 2023E estimated by Krungsri Research

2024-2026 Outlook

- **Demand for warehousing space is expected to expand at an average rate of 5.3% per year.** The market will be lifted by: (i) 3.0-4.0% annual growth in the Thai economy, while an improving outlook in overseas markets will boost the export sector; (ii) ongoing geopolitical stresses, which will encourage some manufacturers to shift production facilities to Thailand, particularly for players in the auto and auto parts, electronics, and clean energy industries; (iii) the establishment of new industrial estates, including the Smart Park Industrial Estate (scheduled to open in 2024), the Apex Green Industrial Park (phase 1 is opening in 2023), the EEC Advanced Healthcare Industrial Estate (opening in 2024) and the EEC Digital Park; and (iv) anticipated 13% annual growth in e-commerce.
- **The supply of new warehouse space is forecast to grow by 5.5% annually** as operators respond to strengthening trade, investment, and manufacturing output. Investors will look in particular at sites in high-potential locations in the BMR, regional centers, the EEC, and border regions that benefit from access to favorable transportation networks linking on to neighboring countries. Development will also tend to focus on built-to-suit models that take advantage of modern digital technologies and that allow companies to better meet their ESG goals. **Demand will slightly outpace supply, and so the occupancy rate will average around 86.5%.**

Figure 2: Outlook of Warehouse Market

Supply	
2023	Average 2024-2026
+6.8%	+5.3%

Demand	
2023	Average 2024-2026
+7.0%	+5.5%

Occupancy Rate	
2023	Average 2024-2026
86.0%	86.5%

Source: Krungsri Research

Logistics (Cont.)

Mass Rapid Transit Operators

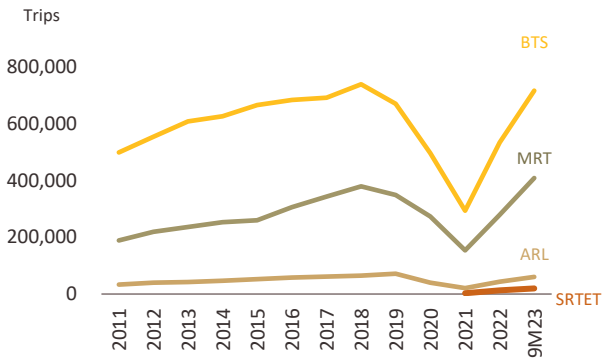
Situation in 2023

- **Over 9M23, operators benefited from steadily increasing ridership** that resulted from: (i) the post-pandemic revival of normal social and economic life, increased on-site work and study, and the return to seminars, exhibitions, and trade shows; (ii) government efforts to stimulate the tourism sector (e.g., phase 5 of the We Travel Together program) and the rebound in the tourism sector (arrivals hit 20m); and (iii) the opening of the Yellow Line, which made travel on to connecting routes more convenient. Market details are given below.
  - **A total of 334.5m passenger journeys were made over 9M23 or an average of 1.2m per day (up 55.4% YoY).** Most journeys (58.5%) were made on the BTS, accounting for 195.8m passenger journeys in total, or 0.72m per day (up 48.5% YoY). 33.4% of journeys were made on the MRT, which carried 111.7m passenger journeys in the period, or 0.41m per day (up 60.8% YoY). In addition, the ARL (4.9% of the total) carried 16.6m passenger journeys, or 60,600 per day (up 53.6% YoY), the SRTET Red Line (1.6% of the total) carried 5.5m passenger journeys, or 20,000 per day (up 71.8% YoY), and the YL Yellow Line (1.5% of the total) carried 4.9m passenger journeys, or 18,100 per day.
  - **Average daily income from fares for travel on the main lines rose 52.5% YoY,** with the BTS (Green Line) increasing 49.7% YoY and the MRT (Blue Line) strengthening by 57.4% YoY.
- **Through to the end of the year, operators will benefit** from: (i) government-backed cuts to fares to THB 20 for travelers on the Red and Purple lines between October 16, 2023, and November 30, 2024, and the newly-run Pink Line (kicked off in November 2023) which connect to the Green, Purple, and Red lines; (ii) the high cost of gasoline, which is shifting passenger demand to mass transit services; and (iii) greater demand for travel at the end of the year, thus increasing ridership on lines that connect to Don Muang and Suvarnabhumi airports. Given this, **for all of 2023, 427.5m passenger trips are expected across the year, or a daily average of 1.6m (up 79.8% YoY). Average daily income will thus increase by 41.2% YoY, split between rises of 38.1% on the BTS and 46.5% on the MRT**.

2024-2026 Outlook

- **The number of passenger journeys is forecast to expand by 10.0-12.0% annually**. This outlook is supported by: (i) expected Thailand economic growth of 3.0-4.0% per year that will lift consumer purchasing power alongside the ongoing rebound in the tourism sector (due to reach 43m arrivals by 2026); (ii) an expansion in work on residential condominium developments alongside or near mass transit systems (the number of new units coming up for sale in the BMR should increase by 3.0-4.0% per year); and (iii) the implementation of the M-MAP plan and the opening of new metro lines, which will increase the number of stations, extend the reach of the network, and improve the ease of interchanging between lines.
- **Income will continue to strengthen** on the opening of the new Pink Line (Khae Rai-Minburi), and its extensions (Si Rat-Muang Thong Thani lake) are expected to begin service in 2025), which will function as feeders and so increase overall ridership. In addition, income from the rental of commercial space in and near stations will also improve.

Figure 1: Mass Transit Passenger Journeys Per Day



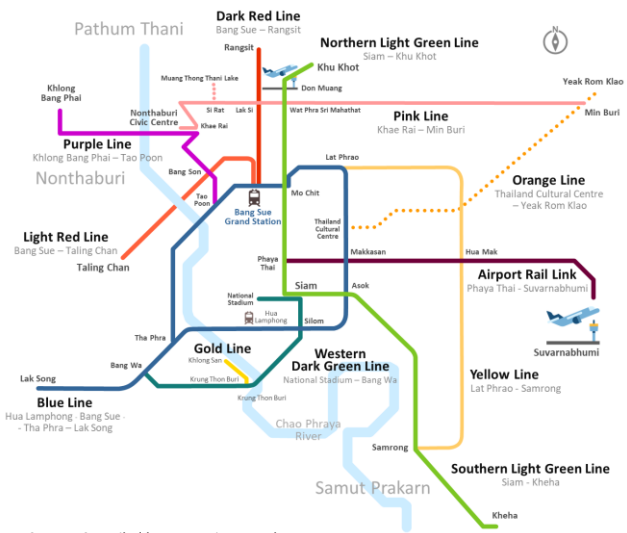
Source: MOT Data catalog
Note: SRTET or Red line commercial services started 28 November 2021
Yellow line commercial services started 3 July 2023

Table 1: Estimated Passenger Journeys in 2023

Daily (Trips, k)	2022	9M-23	2023E	
			Trips	(%YoY)
ARL (Airport Rail Link)	43.7	60.6	77.5	77.3
BTS	534.2	717.4	916.6	71.6
MRT	279.9	409.3	523.0	86.8
SRTET (Red Line)	13.0	20.0	25.6	96.3
YL (Yellow Line)	n.a.	18.1	23.1	n.a.
Total	870.9	1,225.5	1,565.9	79.8
%Growth (YoY)	84.0	55.4	79.8	

Sources: MOT data catalog, companies released, 2023e by Krungsri Research

Figure 2: Extensions to Mass Transit Lines, 2024-2026



Source: Compiled by Krungsri Research
Note: Solid line signifies current mass transit lines.
Dashed line signifies the new lines.

Logistics (Cont.)

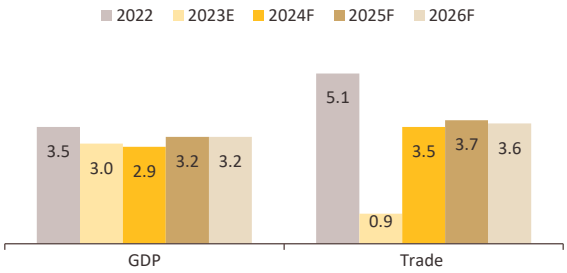
Maritime Shipping

Situation in 2023

- **Business conditions worsened for the sea freight industry over 9M23,** and this was reflected in the slump in the Baltic Dry Index (BDI) and the China Container Freight Index (CCFI) of respectively -43.2% and -69.5% YoY. The market suffered under the sluggishness of the global economy (the IMF sees the world economy growing by 3.0% in 2023, with global trade up by just 0.9%) and the impacts of geopolitical tensions, including the ongoing war in Ukraine and the recent outbreak of fighting between Hamas and Israel. The Thai export sector also contracted by -3.8% YoY, further eroding demand for cargo space.
- **The outlook should improve somewhat through the rest of 2023** as demand for consumer goods firms up with the year-end celebrations and, as the northern hemisphere moves into winter, commodity markets strengthen. In addition, in August, the Thai export sector returned to growth for the first time in 11 months, and this will then boost demand for space on vessels to move both inputs and finished goods. **For all of 2023, bulk and container shippers' income[1/] is therefore forecast to shrink by respectively -16.0% YoY and -36.0% YoY,** a sharp turnaround from 2022's growth of 33.2% and 37.4%.

Figure 1: World GDP & World Trade Volume

(% change)



Source: IMF, World Economic Outlook (October 2023)

2024-2026 Outlook

- **Income is expected to rise by an average of 2.0-3.0% per year** as supply of space and freight demand come closer into balance. The market will benefit from the following tailwinds.

  (i) **The world economy and global trade are expected to expand by respectively 3.1% and 3.6% annually** (source: IMF), while the domestic economy will grow by 3.0-4.0% per year. Thai exports will thus be lifted by a combination of economic growth in overseas markets and importers' desire to build inventories of essential goods (especially of food). As such, the volume of goods both imported and exported will rise.

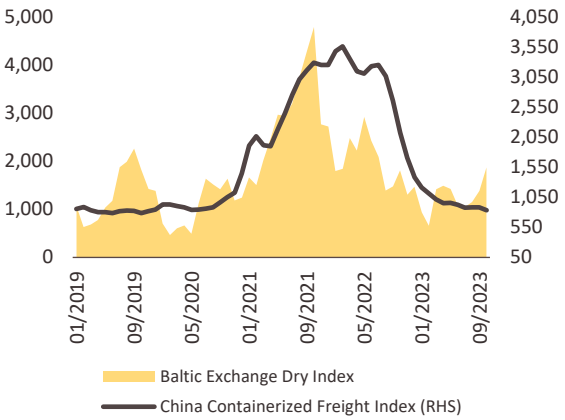
  (ii) **Cargo sea freighters will benefit from growth in the Chinese economy** since China is the world's biggest importer of energy (i.e., of coal, oil, and natural gas). In addition, **freight charges are also expected to stay elevated,** lifted by the sanctions imposed on Russia by Western countries, the decision by the OPEC+ group to maintain upward pressure on oil prices, and the emergence of an El Niño, which will add to food prices and potentially disrupt travel in some areas (e.g., for ships traveling via the Panama Canal).

  (iii) **Operators of container ships will gain from the expansion in the world economy** and the positive impacts of this on purchasing power and demand for consumer goods. However, the market will be negatively impacted by the rapid expansion in shipping space, which is expected to grow 40% from its 2023 level over 2024-2026 (source: TNSC). Container freight charges are thus expected to fall back to their 2019 pre-COVID level.

- **Headwinds will tend to come from higher operating costs.** In particular, fuel prices will remain volatile and elevated, geopolitical tensions may disrupt maritime routes, and players will need to adapt to a tighter regulatory environment (e.g., from 2024, the EU will begin to charge fees under its emission trading system). Nevertheless, by raising freight charges, operators will be able to pass on some of these additional costs, and by better matching the supply of and demand for shipping services, they will be able to grow their income.

Figure 2: Sea Freight Index

(Unit: point)



Source: Krungsri Securities

Table 1: Global Seaborne Trade

(% change)

Year	Total trade	Containerized trade
2024	2.1	3.2
2025	2.2	3.2
2026	2.2	3.2
2027	2.1	3.0
2028	2.1	2.9

Source: United Nations Conference on Trade and Development (UNCTAD, October 2023)

1/ Source: Companies listed on the SET and MAI stock exchanges.

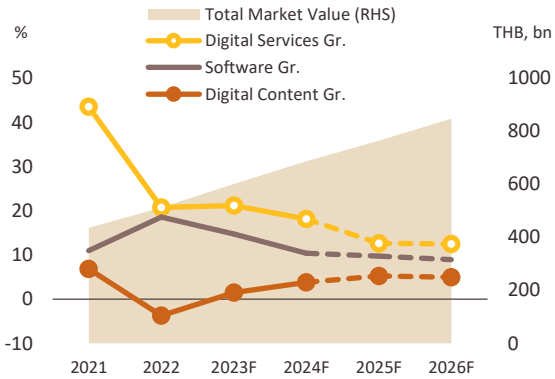
Digital services and software

Situation in 2023

Overall industry revenue will increase through 2023 on strength in the digital services and software segments, while digital content will record a slow growth. Overall industry revenue is thus expected to expand by 17.0-17.5% in 2023, close to the 17.6% growth recorded in 2022.

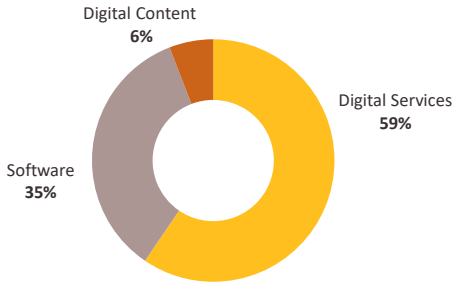
- **Digital services:** With annual revenue growth expected to hit 21.0%-22.0% (close to 2022's 20.8%), digital services are the most important driver of industry growth, mostly driven by: (i) the development of new models for delivering services through digital platforms linking data to online providers and through this, make targeted digital solutions available; and (ii) recovery in business activities, especially in logistics and tourism, which has then boosted online commerce.
- **Software and software services:** Revenue is forecast to grow by 14.5-15.0% this year (a slight slowdown from 18.6% in 2022) as businesses look to raise their forecasting abilities and improve their planning by using big data analytics and AI, that require investments in updating software. Based on Gartner's forecast, expenditure on software of business sector in Thailand will grow 14.9% in 2023 (higher than the global average growth of 9.3%) as Thailand is beginning to develop deep-learning-based data management systems to be a strategic business initiative, using software on AI Cloud as a primary tool.
- **Digital content:** Revenue will grow only 1.0-1.5%, after a -3.7% contraction in 2022, resulting from a slow cycle of games online after the easing of the COVID-19 pandemic, which has returned workers to offices and outdoor activities. However, animation and character businesses will gradually improve as spending on advertising rebounds and audiences return to cinemas, important market channels for the segment.

Figure 1: Revenue Growth by Segment



Source: Depa, Krungsri Research

Figure 2: Share of Annual Revenue by Segment, 2024-2026



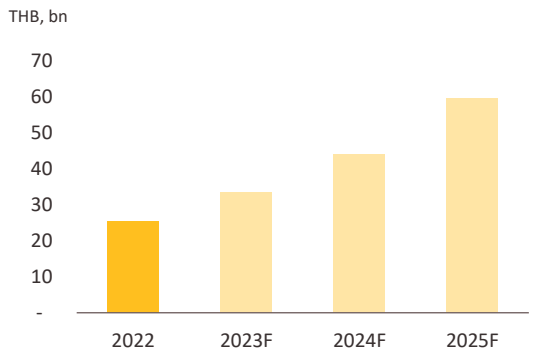
Source: Depa, Krungsri Research

2024-2026 Outlook

Total revenues will continue to enjoy a solid growth of 12.0-12.5% annually. The main growth driver will be digital services, followed by software and digital content.

- **Digital services: Revenue will strongly increase by 14.0-14.5%,** with the increasing dependence of business, finance and consumers on online platforms. Business operators will likely expand their business offerings to consultancy and marketing planning delivered through new media platforms including live social commerce, creative content, performance ads, and media recommendation systems. This will help some segments of the ecosystem especially e-Retail, e-Logistics and Fintech, continue to grow. Other market segments that also demonstrate strong growth potential include HealthTech, supported by the development of medical and health applications.
- **Software and software services: Revenue growth will average 9.5-10.0%** as companies need to restructure around data analytics and AI services and to the use of software to deliver end-to-end services. Furthermore, software will be employed as a tool to seek business opportunities and develop products that create new experiences for customers. Growth potential segments of software services will include Software customization and Software consult.
- **Digital content: Revenue will recover to 4.5-5.0%,** lifted by the release of new PC and mobile games, with a focus on expanding the market for gaming competitions and e-sports, while animation and character will be helped by recovery in the tourism sector, which will add to demand for the licensing of products.

Figure 3: Market Value of Big Data and AI in Thailand



Source: Depa, Krungsri Research

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