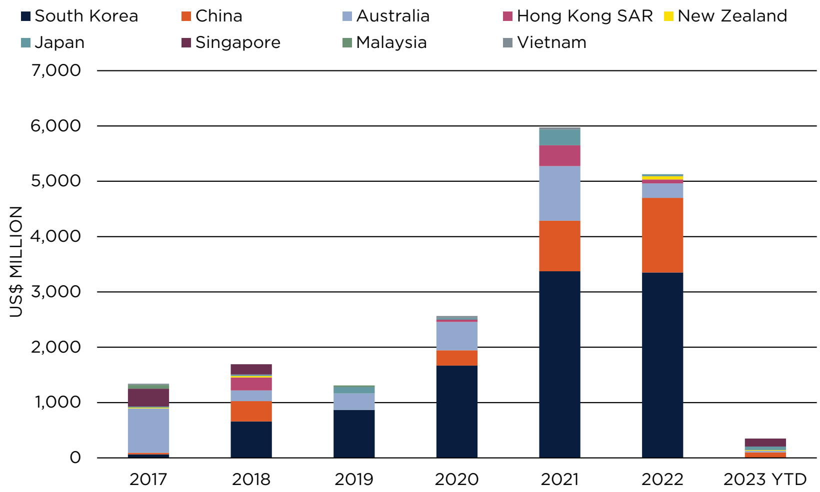
Asia Pacific - June 2023

SPOTLIGHT
Savills Research

Asia Pacific Cold Storage

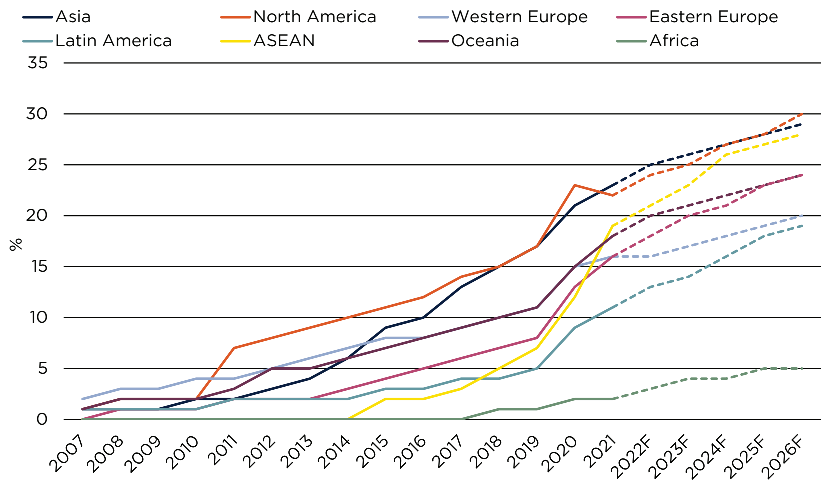
Cold storage sector on the rise amid growing demand in Asia Pacific

GRAPH 1: Asia Pacific Cold Storage Investment Volume by Market, 2017 to 2023YTD



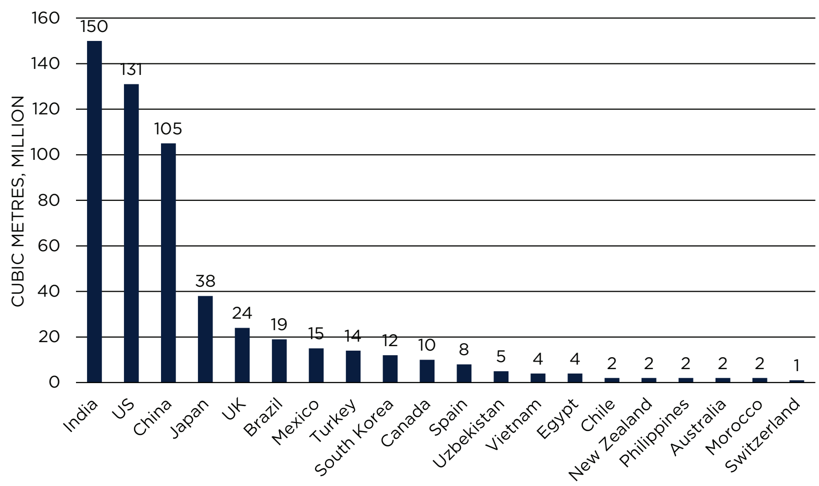
Source MSCI Real Capital Analytics as of 1 Jun 2023
Note Investment volume only includes transactions with a deal size of US$10 million or above.

GRAPH 2: E-commerce Penetration Rate by Region, 2007 to 2026F



Source Euromonitor, Government sources, Morgan Stanley Research, Savills Research & Consultancy

GRAPH 3: Top 20 Cold Storage Warehouse Market by Capacity, 2018



Source Global Cold Chain Alliance, Savills Research & Consultancy

THE COLD STORAGE MARKET IS HOTTER THAN EVER

The wider industrial and logistics market has been an investor favourite over the past few years, logging record-levels of capital inflows. Cold storage warehouses, facilities which utilise refrigeration or air-conditioning to preserve temperature-sensitive and perishable products, have emerged as one of the hottest asset classes attracting US$4.9 billion of investment in 2022. Although accounting for only 11.4% of the total industrial and logistics transaction volume in the region, this market has delivered a staggering 29.6% CAGR from 2017 to 2022, outperforming its peers.

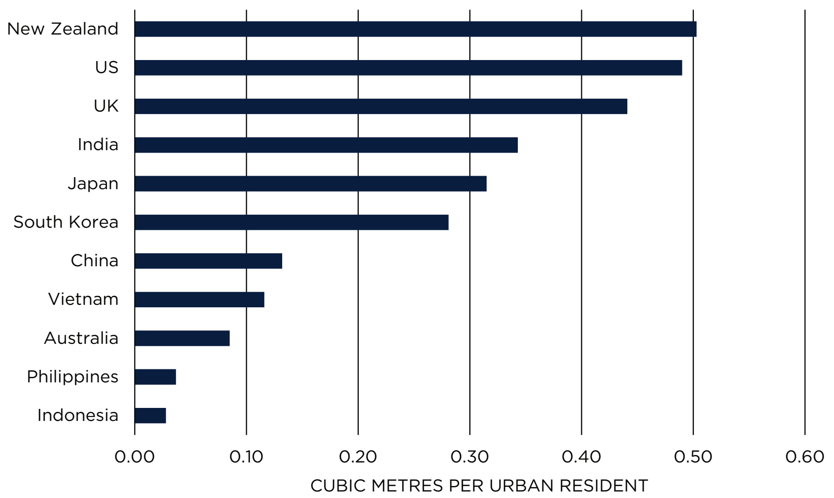
The cold storage business has witnessed a rise in demand due to a number of factors, including increasing household incomes, the rise of urban and middle-class populations, as well as some structural changes to consumer behaviour. As incomes have grown in the region, consumption preferences have shifted towards more perishable and higher-quality foods which have also driven consumers away from traditional wet markets towards supermarkets as well as the purchase of more frozen, processed, and pre-prepared products for convenience and variety. These behavioural changes have translated into complementary demand for cold storage infrastructure. Another key contributing factor is the boom of e-commerce and online grocery sales, which were further accelerated by pandemic tailwinds as many turned to online shopping out of necessity during lockdowns. E-commerce penetration rates in markets such as mainland China (27%) and South Korea (27%) are now among the highest in the world, well above the global average of 22% in 2022. Meanwhile emerging markets, such as the ASEAN bloc, are experiencing rapid digitalisation among their youthful populations, their key consumer group. The ASEAN bloc is expected to see an estimated 17% CAGR in its e-commerce penetration rate between 2022 and 2026. All in all, e-commerce will account for about 29% of total retail sales in Asia by 2026, just slightly below the 30% average in North America. In addition, the pandemic has also spurred the storage need for vaccines, pharmaceuticals, and other healthcare products which require temperature-controlled cold chain logistics.

Government support also plays a major role in the development of the sector, especially in countries with sizable agricultural industries. China has released an 'National Logistics Hub

Layout and Construction Plan′ to improve infrastructure and logistics capabilities, aiming to establish 150 advanced logistics hubs by 2025, and during the 14th Five-Year Plan period (2021-2025), it is looking to set up 30 national and 70 regional cold-chain logistics bases for agricultural products. Likewise, the Indian government has also invested heavily in the industry, as well as encouraging private participation through various subsidy schemes, such as the 'Pradhan Mantri Kisan Sampada Yojana' and the 'Mission for Integrated Development of Horticulture' scheme, which both provide financial support in the form of grants-in-aid.

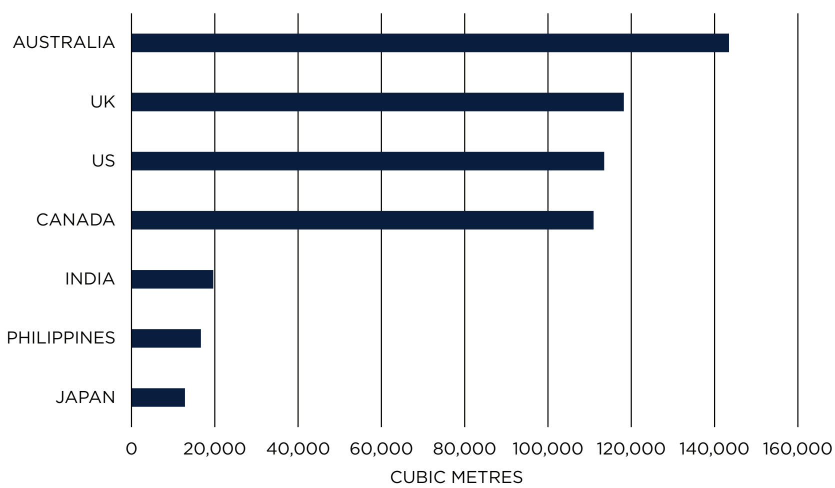
As consumption habits change, a well-developed cold chain industry will be integral to delivering the higher quality products Asian consumers seek.

GRAGH 4: Per Capita Cold Storage Capacity by Market, 2018



Source Global Cold Chain Alliance, Savills Research & Consultancy

GRAGH 5: Average Cold Storage Warehouse Size by Market, 2018



Source Global Cold Chain Alliance, Savills Research & Consultancy

Compared to other regions, Asia Pacific's cold storage market is still at a nascent stage, with a few dominant markets including mainland China, India, Japan, South Korea, and Australia. According to a report released by the Global Cold Chain Alliance (GCCA), in terms of total stock, India is the largest cold storage market in the world, with about 150 million cubic metres of space, with China (105 million) and Japan (38 million) taking third and fourth place. However, supply is still struggling to match demand. The per capita availability of cold storage space across major Asia Pacific markets varied from 0.03 cubic metres to 0.50 cubic metres in 2018. New Zealand leads the region with 0.50 cubic metres, followed by India (0.34) and Japan (0.32). However, apart from New Zealand, the regional average is significantly lower than the average in the US and UK, which stands at 0.49 and 0.44 cubic metres respectively. The region would need another 325 million cubic metres to reach the average capacity of the US and UK, which is more than double the 2018 stock level based on GCCA's estimates.

Furthermore, much of the existing stock in the region is smaller in size and less automated compared with mature markets. For example, cold storage warehouses in India often range from 15,000 to 25,000 cubic metres per facility compared to over 100,000 cubic metres in developed economies such as Australia, the UK and the US. Therefore, apart from constructing new builds, renovation and retrofitting of existing facilities is also needed to bridge the gap in the meantime. The adoption of automation, such as automated storage and retrieval systems (ASRS) and goods-to-man picking set-ups, is entering the Asian cold storage market in a significant way. This can help to achieve the same storage capacity in a smaller building, reduce power usage and increase the productivity of warehouse operatives. Yet the capital cost is not significantly higher for a new build facility. Automated facilities will also reduce operating costs for tenants, which ought to lead to higher rents.

All in all, a structural shortfall is expected to persist in the industry beyond the short and medium term, which will translate into higher occupancy rates, stronger rental growth, and desirable investment opportunities.

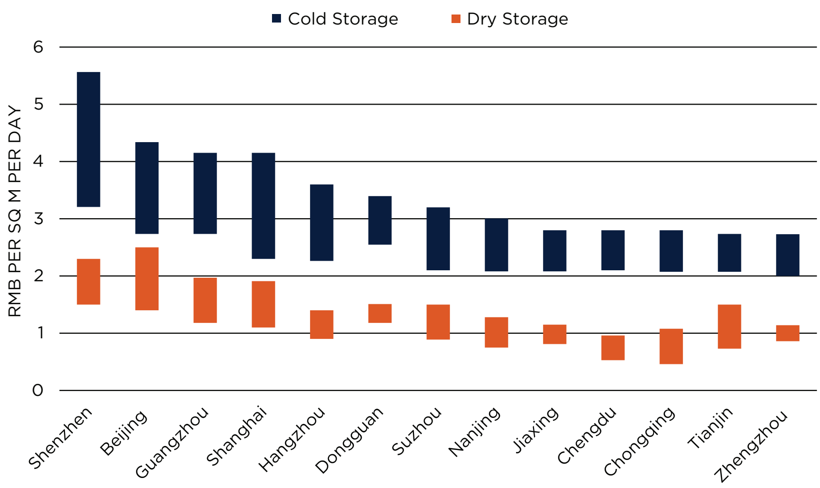
COLD STORAGE WAREHOUSES LURE INVESTORS WITH HIGHER YIELD POTENTIAL

Cold storage warehouses entail higher capital and operational costs than regular dry warehouses due to their structural complexity, which also implies a longer turnover period. Health and safety concerns associated with the stored products also subject these warehouses to more regulations, making it difficult for new entrants to navigate the regulatory landscape and obtain the necessary permits. As a result, cold storage facilities are often highly customised and built-to-suit, which hinders the ability of new tenants to repurpose or retrofit. Therefore, many players in this field are upstream retailers or third-party logistics operators with extensive know-how, whereas institutional investors often team up with cold chain operators, retrofitting old dry warehouses. Direct acquisition opportunities are rare as there are typically only a limited number of mature properties on the market.

As an example, experienced logistics and industrial property developers and operators like ESR and GLP manage several private equity funds which invest in cold storage facilities as part of their portfolio, such as the recently closed GLP China Income Partners V, which had raised the most capital among funds targeting Asia Pacific in 2022. GLP is also planning to build 100 cold storage facilities across China by the end of 2025.

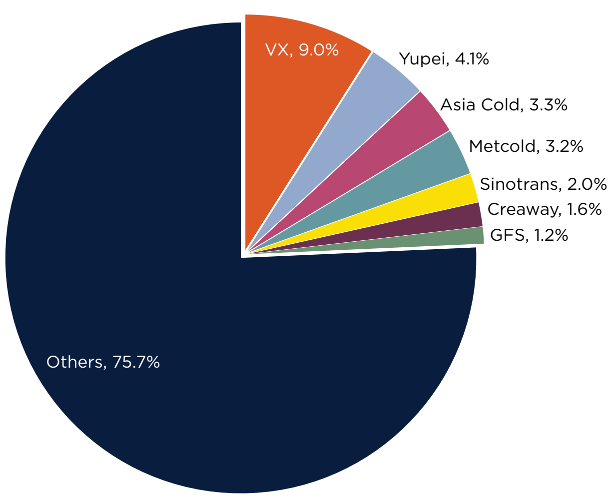
However, as the margins available from logistics and industrial assets have narrowed substantially over the past few years, the quest for yield has prompted more investors to look at niche properties. The higher risk premium for cold storage is partly balanced by the tight vacancy, longer lease terms (cold storage leases tend to be twice as long as those for dry warehouses) and 'stickier' tenants the sector offers under a fundamentally undersupplied disequilibrium. The positive sentiment is being priced in with yield compression noted even during the pandemic. On average, we see that prime cold storage warehouses offer 4.0% to 5.5% yields across major Asia Pacific markets, representing a 30 to 150 bps spread over dry warehouse margins.

GRAPH 6: China Cold and Dry Warehouse Rental Range by Market, 2022



Source Savills Research & Consultancy

GRAPH 7: China Cold Storage Operators by Market Share, 2022



Source Savills Research & Consultancy

MAJOR MARKETS

China

The online grocery business is booming in China, with its market size projected to grow from RMB572.4 billion in 2021 to RMB1,210.4 billion in 2025, reflecting an 111% growth rate. In addition to fresh food products, there is also strong demand for ready-to-cook ingredients and pre-prepared dishes as people have less time to cook at home and restaurants aim to reduce costs by having some food preparation done off-site. CITIC Securities projects the market for pre-prepared dishes will reach about RMB1 trillion in the next ten years. As a result, more cold chain facilities are expanding capacity and adding production lines to store, process, and package food products. The demand for cold storage is estimated at around 300 million tonnes of food products per year, based on the annual output of the fruit, vegetables, meat, seafood, dairy, and frozen food sectors. This figure is expected to rise to over 400 million tonnes in 2025, a growth of over 30%. In total, cold storage supply is falling short by 100 million tonnes per year versus demand.

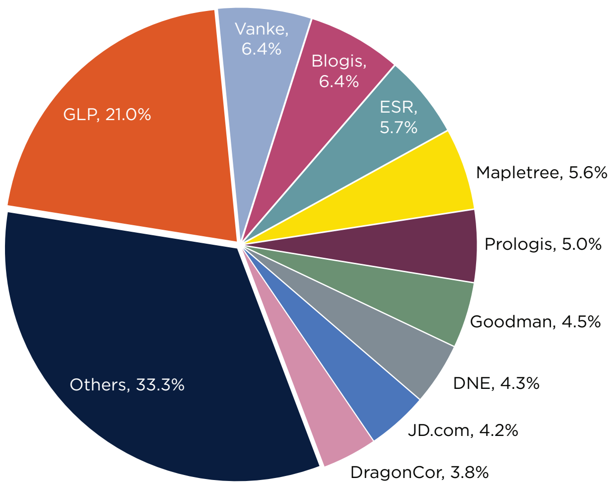
Rents for prime cold storage warehouses are about two to three times higher than for dry warehouses, ranging from RMB2.0 (Zhengzhou) to RMB5.5 (Shenzhen) per sq m per day across markets. Shenzhen tops the list at RMB5.5 per sq m per day, driven by tight supply dynamics, followed by Beijing and Guangzhou at RMB4.3 and RMB4.2 per sq m per day respectively. It has become increasingly difficult to find suitable plots to build logistics facilities in first-tier cities due to high land prices and strict planning controls. The high energy requirement for cold storage operations has also caused some cities to cap development under the 'dual carbon' policy. This has forced many investors to look at satellite cities nearby, and the spill-over demand will continue to drive up rents across larger metropolitan areas.

The cold chain logistics market in China is highly competitive and fragmented, with operators often bound by their regionality. Nationwide operators like SF Express and JD Cold Chain often engage in both cold chain logistics and storage. The cold chain network is still heavily concentrated in eastern China, especially the Yangtze River region, as well as the northern Beijing-Tianjin cluster, while the south lags behind. As a result, we have also seen more investors actively building and acquiring cold chain properties in the Greater Bay Area (GBA). For example, Blackstone acquired the Guangzhou International Airport R&F Integrated Logistics Park, the largest urban logistics park in the GBA, from R&F Group through two acquisitions in 2020 and 2021. The park has about 889,820 sq m of high quality leasable industrial space, and 140,000 sq m of undeveloped land area, upon which Blackstone is constructing additional cold storage facilities tailored for the food and pharmaceutical industries.

We have also seen a number of operators and developers, including VX Logistics, Metcold, Asia Cold, Orange3, Creaway, Wanxin Cold Chain, and Global Freezer Services, rapidly expanding their cold storage networks across the country. In the first half of 2021 alone, the market saw 3.54 million additional tons of newly built and renovated cold storage supply. Yet prime cold storage facilities only account for 28% of total stock, with VX Logistics being the largest with a mere 9% share. Thus, we expect to see ample opportunities for consolidation and expansion of integrated cold chain networks going forward. Meanwhile, the continued rental growth for prime warehouses in first-tier cities will likely spur more retrofitting of dry warehouses and new builds in neighbouring cities.

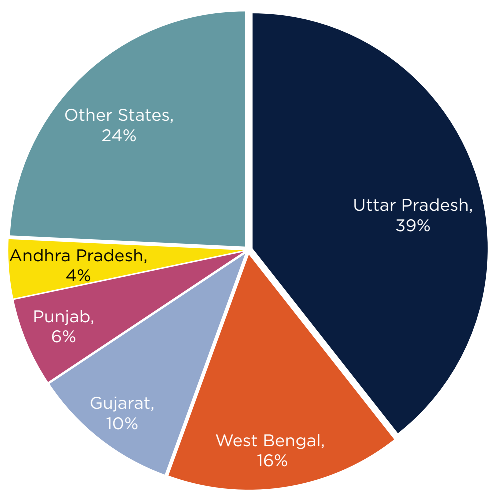
On the investment side, logistics and cold chain assets have lost none of their allure as structural drivers, along with the low interest rate environment, remain compelling. Besides veteran investors such as GLP, ESR, and DNE, the market is also seeing new players enter the space including CapitaLand, Link REIT, NWS and Morgan Stanley. Competition for investment-grade cold chain facilities has increased, compressing yields to commercial property levels.

GRAPH 8: China Logistics Property Stock by Ownership, 2022



Source Savills Research & Consultancy

GRAPH 9: India Cold Storage Capacity by State, 2022



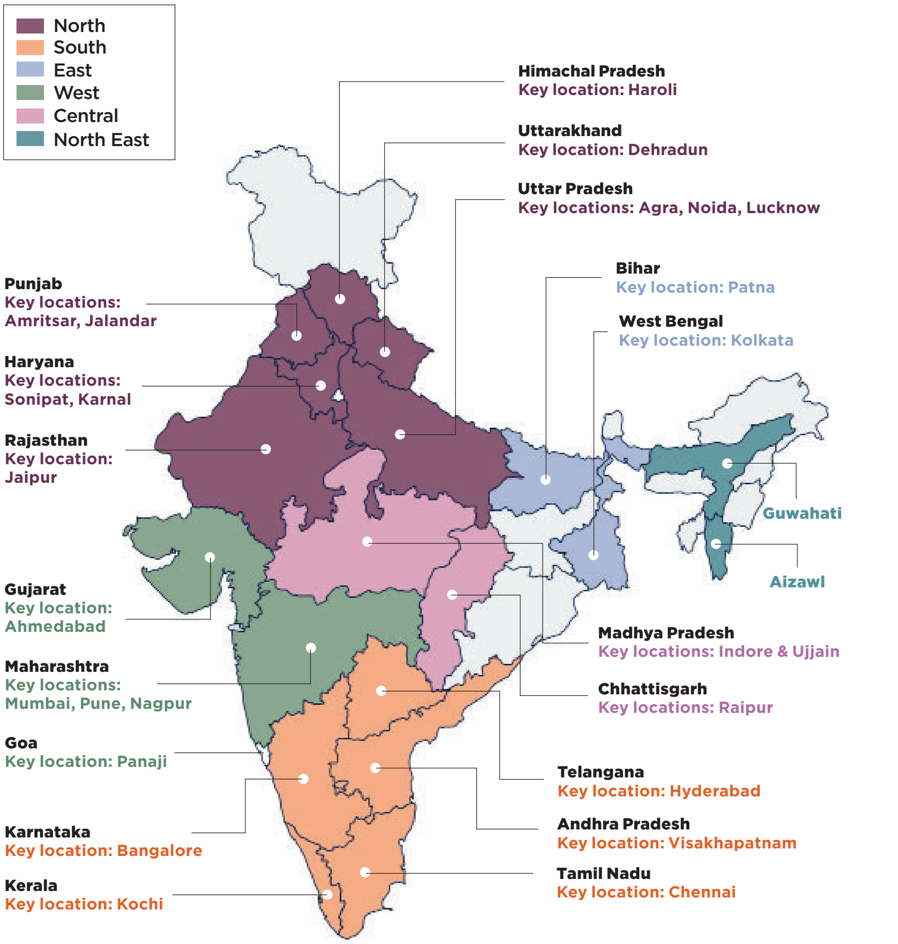
Source Ministry of Food Processing Industries, Savills Research & Consultancy

INDIA

India is one of the fastest growing countries for the cold chain industry. The cold storage market was valued at US$9.23 billion in 2022 and is expected to grow at a CAGR of 5.67% from 2022 to 2028 according to Mordor Intelligence, backed by the country's large agricultural sector, booming pharmaceutical, and retail sectors, as well as the evolving lifestyles of consumers. At present, India is the world's largest producer of milk, it's second largest producer of fruit & vegetables, food grains and marine products and the fifth largest producer of meat and meat products. The Indian pharmaceutical industry is growing in leaps and bounds and is carving a niche for itself in the global pharma terrain.

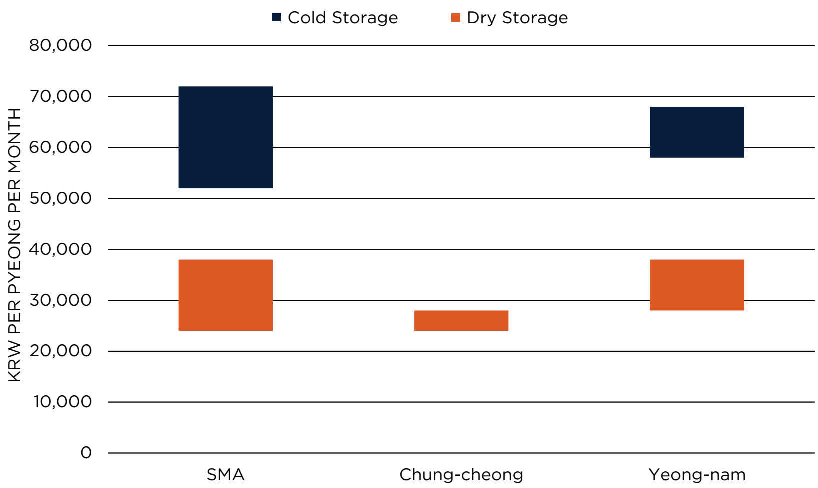
The Indian government has also implemented a range of policies and schemes to support the development of the cold storage market in the country, including a 100% FDI allowance, 100% exemption for food processing units on profits for the first five years and 25%/30% for the next five years, and a number of subsidy schemes. For example, the Ministry of Food Processing Industries (MoFPI) has been implementing an umbrella scheme, Pradhan Mantri Kisan Sampada Yojana (PMKSY), with an allocation of US$585 million for the period 2021-22 to 2025-26. This scheme is expected to leverage investment worth US$1.41 billion into the cold chain industry through supporting the establishment of mega food parks, integrated cold chain and value added infrastructure, infrastructure for Agro-

MAP 1: India Cold Storage Capacity, 2022



Source Savills Research & Consultancy

GRAPH 10: South Korea Cold and Dry Warehouse Rental Range by Market, 2022



Source Savills Research & Consultancy

processing clusters and the expansion of food processing and preservation capacities.

At the moment, the cold storage market in India is highly fragmented with over 3,000 players distributed unevenly across the country, with the majority of facilities located in the northern and western regions. According to the Ministry of Agriculture and Farmers Welfare, the country had around 8,361 cold storage warehouses in 2022, and Uttar Pradesh, West Bengal, Gujarat, and Punjab together accounted for 71% of the country's total storage capacity. However, there has been a trend towards the development of cold storage facilities in other regions, including in the south and east.

High initial and operating costs and a lack of adequate infrastructure remain major hurdles for this asset class. A fully integrated multi-commodity cold storage facility with 5,000 pallets would cost around US$3.4 million to build and require an acre of land, whose cost will add another 10% to 12% to the project total. On top of which, operating costs for the cold storage business in India are approximately US$8.0 to US$9.5 per pallet per month, compared to a US$3.0 average in western countries. Electricity expenses alone make up about 25% to 30% of total operating expenses compared to around 10% in the West. Lastly, choosing the right location is critical given the infrastructure gap, as is securing the necessary permits and approvals. These factors in combination set a high barrier to entry and largely limit investors to domestic veterans.

The Indian cold chain market has continued to grow in recent years through enhanced efficiency, optimizing end-to-end logistical progress, providing one-stop-shop cold chain solutions, and taking advantage of the growing number of 3PL players. The trend towards outsourcing temperature-controlled logistics is expected to drive demand for end-to-end supply chain services in this sector. In addition to storage and distribution, cold chain operators are expected to offer value-added services to meet the evolving needs of the market.

SOUTH KOREA

South Korea boasts a well-developed cold storage market, supported primarily by its robust e-commerce and overnight delivery business, with frozen foods having emerged as one of the fastest-growing market segments. The nation's online retail sales penetration rate reached 27.3% in 2022, ranking among the highest globally.

The majority of cold storage warehouses are situated in the Seoul Metropolitan Area (SMA), which is estimated to host 70% of the total 4.5 million sq m of cold stock as of December 2022. The remaining markets, including Yeong-nam (24%), and Chung-cheong (3%) are still developing.

In contrast to other APAC markets, where the logistics sector typically maintains more stable tenancies than office spaces, logistics leases in SMA are commonly more elastic except for a few large occupiers such as Coupang, Market Kurly and major parcel companies, some of which incur significant capex investments for automation. The average lease period for a logistics asset is about two years, which is shorter than the three-to-five-year lease term for prime office space and thus results in more volatility in the rental market.

While varying largely by region, the average rent for cold storage warehouses in the SMA was KRW60,100 per pyeong per month in 2H/2022, nearly double the average of dry storage warehouses (KRW29,000 per pyeong per month) based on face rents, though the effective rental gap is likely lower. Due to elevated new supply levels in recent years, cold storage landlords are giving more rent-free periods as an incentive to secure tenancies. For example, in the Incheon region, lease terms vary significantly, with one centre reported to be marketing up to four rent-free months per lease year, a substantial discount from the standard one to two-month practice. We also expect more vacancy pressure coming from the supply-end, as total cold storage stock is predicted to almost double in size from 4.5 million sq m in December 2022 to approximately 8.6 million sq m in 2025. This represents an annual addition of about 1.4 million sq m, far exceeding the previous 10-year average of 326,000 sq m. Of the total, 78% of the new supply is concentrated in the SMA, of which 33% is in the Southwest submarket, followed by Southeast and South Central.

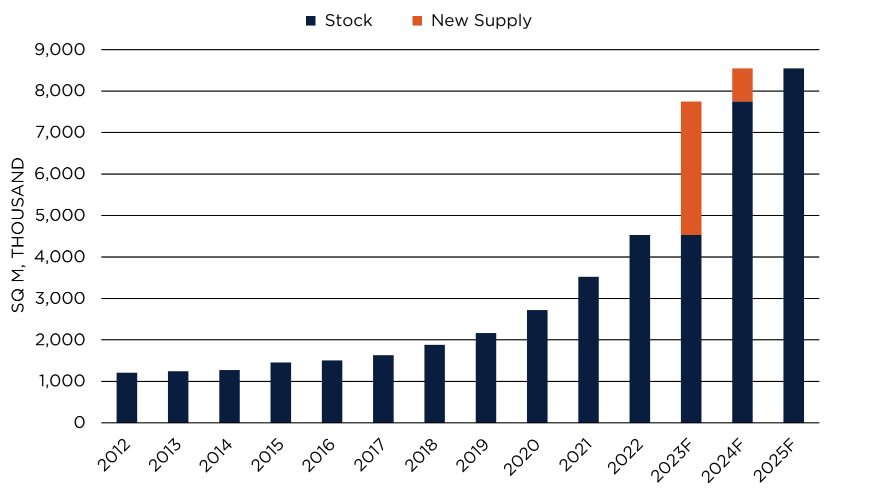
Looking ahead, we anticipate that effective rents for cold storage warehouses will compress by 5% YoY in 2023. Investment momentum is also likely to slow further in 2023 amid rising interest rates. With logistics properties yields standing in the high-4 to mid-5% range, the narrowing spread versus government bonds has prompted many investors to adopt a wait-and-see approach, despite the strong currency positions some cross-border investors hold. While stabilized modern warehouses offer a yield spread of 100 to 130 basis points above those of office assets in the SMA at the moment, the latter is backed by greater rental stability and a more favourable outlook due to tight supply conditions in the short to medium term. Consequently, we expect more investment interest to be diverted from logistics properties until the market absorbs the current spike in supply. Nonetheless, despite near-term challenges from oversupply, the long-term fundamentals remain robust.

VIETNAM

Vietnam's growing middle class and thriving economy have bolstered the demand for high-quality food products. The country's fresh food sales surged from US$40.4 billion in 2020 to US$45.7 billion in 2022, a CAGR of 6.3%. Strong domestic demand coupled with a booming e-commerce scene are primary catalysts for the country's cold storage development. Vietnam's e-commerce market also witnessed a remarkable annualised growth rate of 21.5% from 2017 to 2022, fueling the expansion of all kinds of complimentary services. The online food delivery market is therefore also experiencing significant growth, with a CAGR of 5.5% from 2020 to 2022, driven by evolving consumer preferences and increasing e-commerce adoption.

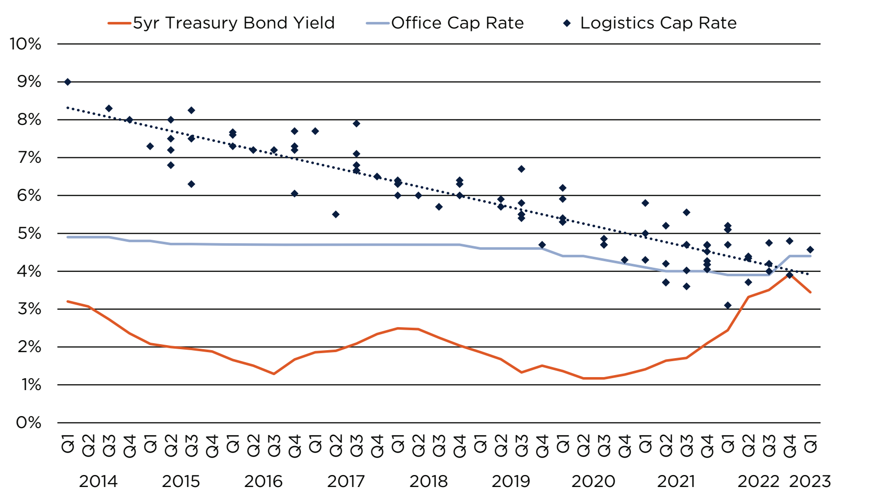
Similar to other emerging markets in the region, Vietnam's cold storage landscape is localized and highly fragmented, with over 40 projects providing a total of 460,000 sq m of cold chain warehouse space in 2022. The facilities are relatively small and located in the key cities. Southern Vietnam's cold storage scene is more developed due to higher demand for food, seafood, and retail

GRAPH 11: South Korea Cold Storage Stock, 2012 to 2025F



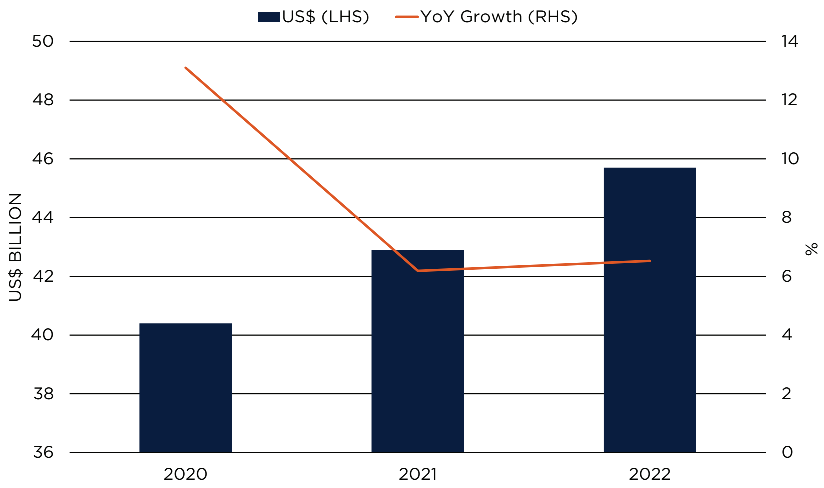
Source Oxford Economics, Savills Research & Consultancy

GRAPH 12: South Korea Property Cap Rate Trends, Q1/2014 to Q1/2023



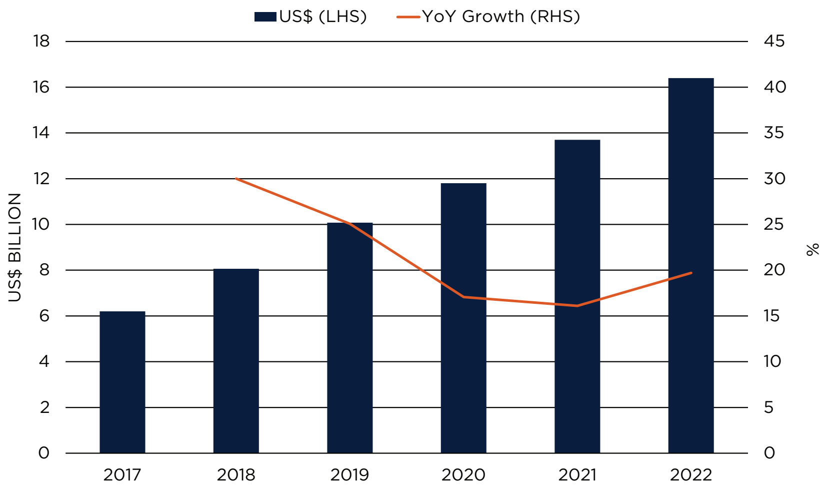
Source Bank of Korea, Savills Research & Consultancy

GRAPH 13: Vietnam Fresh Food Sales and Growth, 2020 to 2022



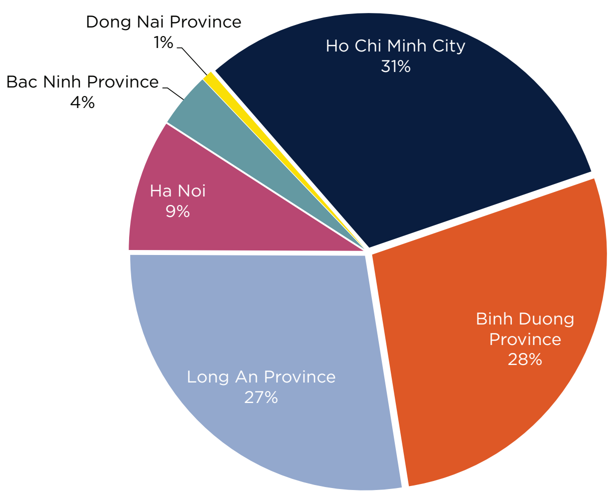
Source Euromonitor, Savills Research & Consultancy

GRAPH 14: Vietnam E-commerce Revenue and Growth, 2017 to 2022



Source Ministry of Industry and Trade, Savills Research & Consultancy

GRAPH 15: Vietnam Cold Storage Capacity by Submarket, 2022



Source Savills Research & Consultancy

processing in the area. Most existing stock is concentrated in Ho Chi Minh City and its surrounding provinces, such as Binh Duong, Long An, and Dong Nai, which together account for 87% of the total, although we have seen supply ramping up in Ha Noi and nearby Bac Ninh province in recent years.

Rents for cold storage warehouses vary greatly across the submarkets, as the more developed facilities with better value-added services in Ho Chi Minh City command much higher rental levels, almost double those of other regions. On average, prime cold storage warehouse rents in Vietnam often fall in the range of US$22 (Bac Ninh) to US$50 (Ho Chi Minh City) per tonne.

In terms of developers, domestic companies provide the most new supply. At the end of 2022, An Viet, Phan Duy, Hung Vuong, ABA Cool Trans were the leading cold storage suppliers, however, foreign companies, such as Lineage Logistics, SK Logistics, and Lotte Logistics are also actively expanding their presence in the market.

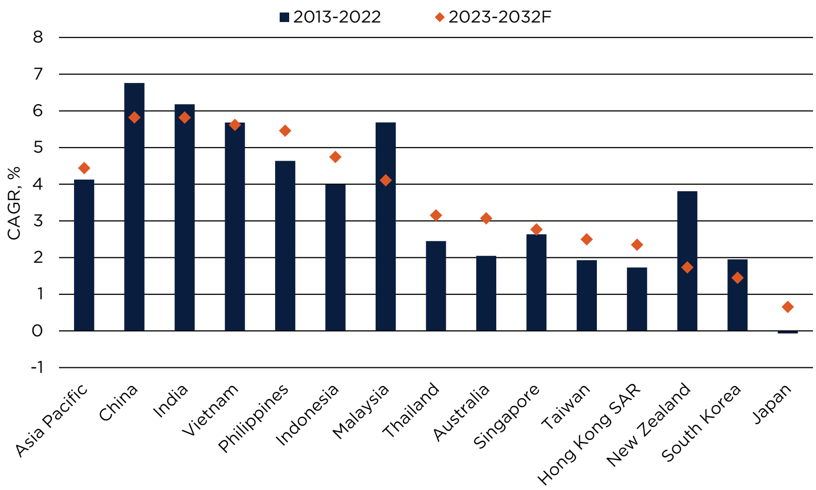
Nonetheless, demand continues to outstrip supply in Vietnam, with the rise of e-commerce platforms placing immense pressure on cold storage capacity. The overall market occupancy rate stood at around 88% at the end of 2022, with major markets such as Ho Chi Minh City, Binh Duong, Long An, and Bac Ninh provinces hovering over 90%.

OUTLOOK

In the coming decade, Asia Pacific's economic growth will elevate more people to the middle class with greater wealth and higher levels of spending. This shift will continue to drive changes in the retail landscape as consumers demand higher quality products which require proper preservation in a controlled environment, particularly in the pharmaceutical, healthcare and food and beverage sectors. According to Oxford Economics, private consumption expenditure in Asia Pacific is forecast to increase at a CAGR of 4.4% between 2022 and 2032, outpacing other regions globally. This expansion in consumption will be the main driver propelling the growth of cold storage and logistics services in the longer run

To meet this rising demand, it will be necessary for cold chain transport and storage capabilities to continue to improve. While there are still hurdles such as a lack of adequate infrastructure and technology and inefficiencies in the logistics network to overcome, governments in the region are actively supporting development through

GRAPH 16 : Private Consumption Expenditure Growth Rate, 2012 to 2032F



Source Oxford Economics, Savills Research & Consultancy

policies and subsidies. Combined with the continued investment from private players, advancing automation and new technology, the cold chain industry is well-positioned for further expansion. However, investors will need to navigate risks such as higher operation risk, economic volatility and narrowing yield spreads to capitalize on the opportunities which the cold chain industry presents in Asia Pacific. We would argue that a well-located, well-designed automated warehouse will outperform conventional competition from an operating cost perspective, and the market will see more transactions and greater institutional involvement ahead.

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