



KOREA COLD STORAGE

An Investor's Guide





EXECUTIVE SUMMARY

Recent years have seen robust demand for high quality industrial and logistics assets in Greater Seoul on the back of strong domestic consumption, e-commerce expansion and the development of modern logistics facilities into an institutional investment product.

This surge in interest has led to investors seeking investment opportunities along all stages of the supply chain, with refrigerated logistics facilities, or cold storage, emerging as an area of focus amid the rapid growth of the Korean fresh food e-commerce market.

This report by CBRE Research tracks the evolution of the cold storage market in Greater Seoul and analyses the growth potential of this compelling new asset class.



CONTENTS

**WHAT IS
COLD
STORAGE?**

04

**DEMAND
DRIVERS**

08

**MARKET
OVERVIEW**

15

**LEASING &
INVESTMENT**

18

CONCLUSION

26

A photograph of a cold storage warehouse. The room is filled with rows of white pallets stacked high, arranged in aisles. The ceiling is white and features several large, black, circular fans mounted on it. Fluorescent lights are visible on the ceiling, providing bright illumination. The floor is a light-colored, smooth surface. The overall atmosphere is clean and industrial.

WHAT IS COLD STORAGE?



WHAT IS COLD STORAGE?

Definition and design of cold storage

Cold storage refers to warehouses where products that require temperature-controlled conditions are stored, packaged and distributed. They can be classified into two main types: chilled warehouses for keeping perishables fresh, and frozen warehouses for frozen goods.

SF Express, one of Asia Pacific's leading Third-party Logistics (3PL) companies, categorises its temperature-controlled warehouses into four types:

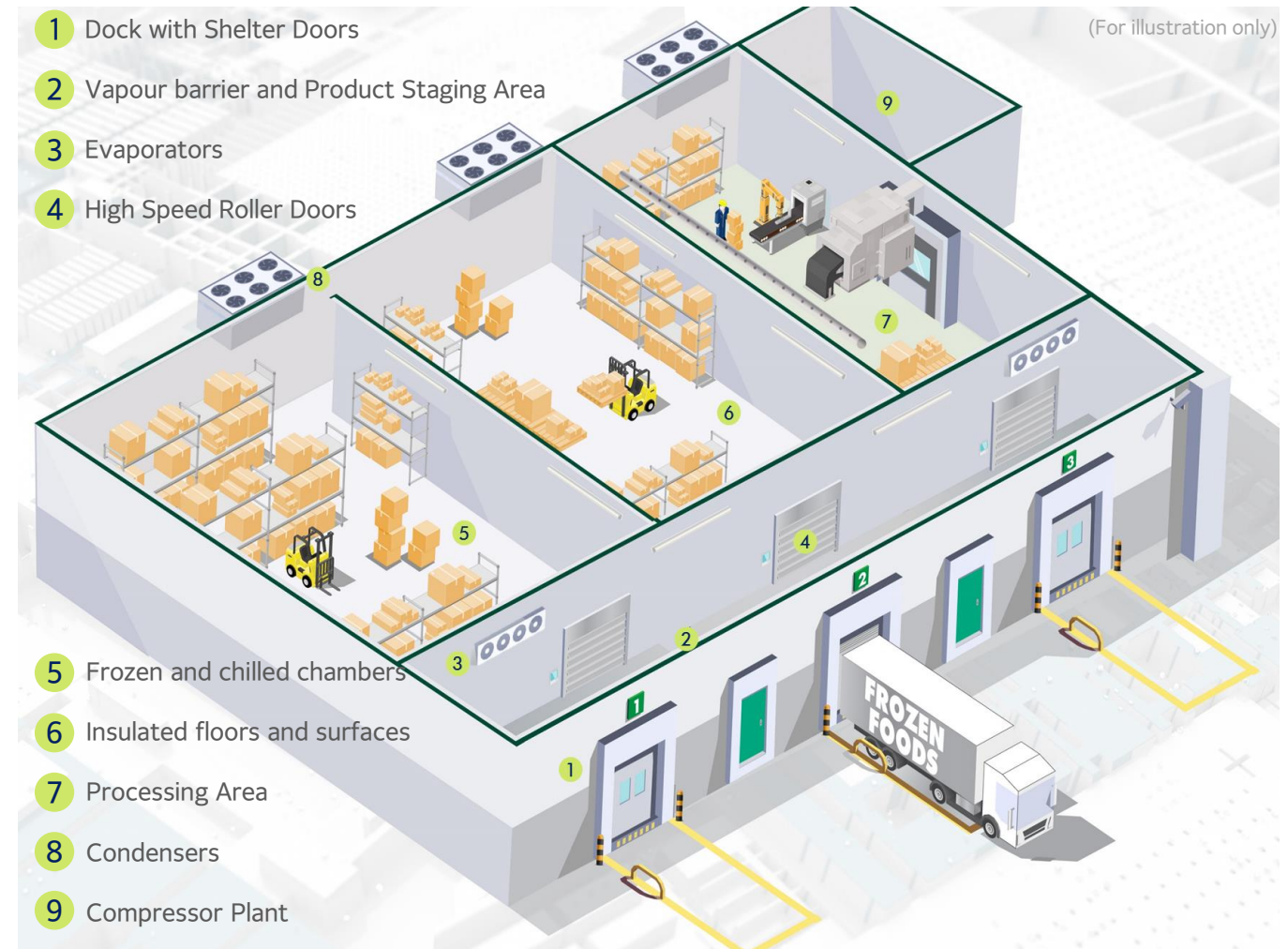
- Deep Frozen (under -25°C),
- Frozen ($-18^{\circ}\text{C} \sim -15^{\circ}\text{C}$),
- Chilled ($0 \sim 4^{\circ}\text{C}$)
- Air-conditioning ($17 \sim 22^{\circ}\text{C}$).

Cold storage facilities are more complex than conventional dry warehouses as they are equipped with various structural and mechanical features to maintain temperature and humidity within a pre-defined range. Higher and more reliable electricity supply is also required.

TYPES OF GOODS KEPT IN COLD STORAGE

The varied temperature range of cold storage is designed to maintain the quality and shelf life of different perishable products such as vegetables, dairy, meat, seafood and frozen food. Other temperature-sensitive products include pharmaceuticals, vaccines, wines, tobacco and chemicals.

FIGURE 1: INSTALLATIONS IN COLD STORAGE FACILITIES



Source: CBRE Research, Oct 2019.



COLD-CHAIN INDUSTRIES

Industries and companies in needs of cold storage

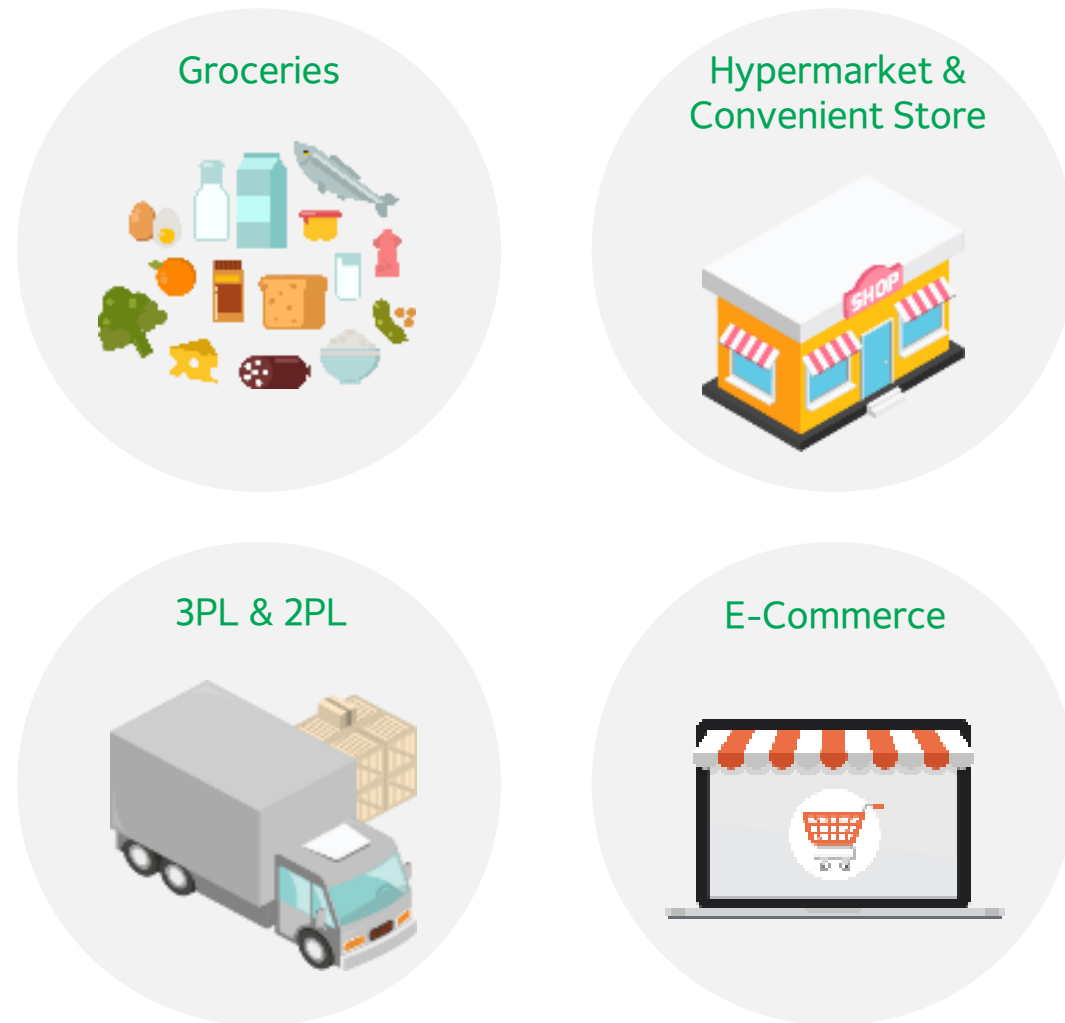
As the consumption trend of the food market changed, the demand for delivery of fresh and convenience foods has been drastically increased. Fresh foods that are difficult to store were items that customers had to visit and buy in person, but the development of cold storage and logistics systems promoted online purchase of fresh foods.

Recent growth of overnight fresh food delivery service enhanced the competition between retailers to strengthen their delivery capabilities. As it becomes important to secure logistics centers in a suitable location, some hypermarkets are switching offline stores to online distribution centers that can foster overnight delivery service.

As consumers' food and beverage consumption channels have shifted online, manufacturers have also begun to strengthen their online platform which is based on high margins and price competitiveness. Examples of this include Korea Yakult's 'High Fresh', CJ CheilJedang's 'CJ The Market', and Dongwon F&B's 'Dongwon Mall'.

Coupage, Korea's leading e-commerce company and representative of last-mile delivery called 'Rocket Delivery', currently owns the largest number of logistics hubs among Korean e-commerce companies. They have continued to expand their logistics capacity from 37,000 pyeong in 2014 to 221,000 pyeong in 2016 and 370,000 pyeong in 2018. The number of different products they carry were increased from 60,000 in 2014 to 5 million in 2018.

FIGURE 2: MAIN COLD STORAGE PLAYERS



Source: CBRE Research, Oct 2019.



EVOLUTION OF COLD STORAGE FACILITIES

From simple storage to distribution centers

FROM SIMPLE STORAGE TO DISTRIBUTION CENTERS

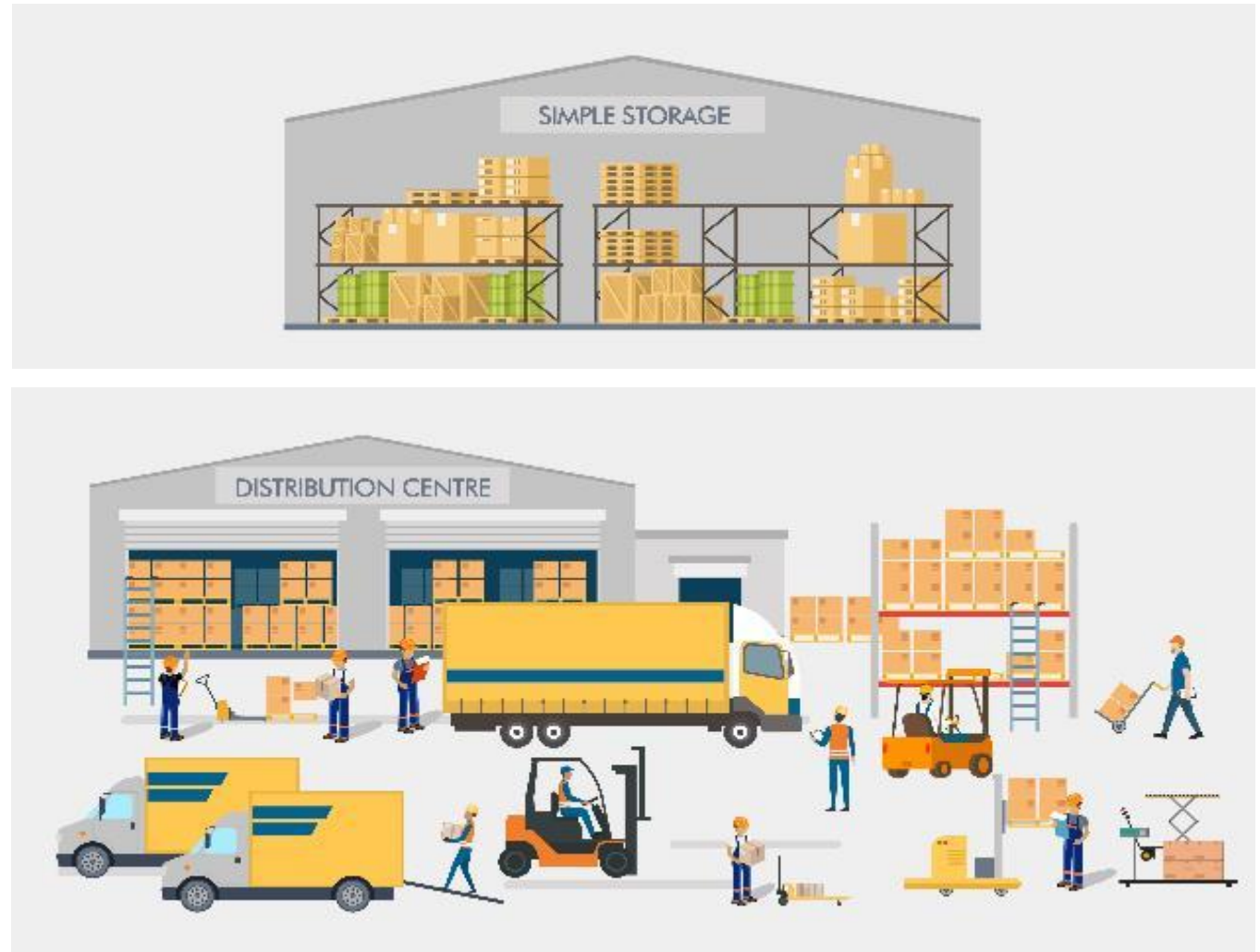
Cold storage in Korea has evolved rapidly in recent years from providing basic storage facilities for grocery manufacturers to serving large-scale distribution channels for hypermarkets and e-commerce companies.

Most cold storage facilities in Korea are still basic storage centres with a limited number of incoming and outgoing shipments. Properties of this type feature single dock access with elevators to floors above; are usually master-leased to a single tenant with long-term storage needs; and tend to find it challenging to secure replacement tenants when vacated.

As retailers put more emphasis on quality as well as delivery speed, last mile delivery has become increasingly important. Recent years have seen the development of more sophisticated cold storage facilities that are used for last mile delivery and must therefore handle frequent incoming and outgoing shipments.

These properties are located in strategic locations; feature truck access on every floor; and are equipped with sophisticated temperature control systems to store various products. Newer facilities of this type also serve as fulfillment centres, handling every stage of cold chain logistics from incoming, to processing, to outgoing.

FIGURE 3: EVOLUTION OF COLD STORAGE FACILITIES



Source: CBRE Research, Oct 2019.

A close-up photograph of a worker wearing a bright green high-visibility jacket and grey work gloves. The worker is holding a white clipboard with a silver clip. The background is a blurred warehouse or industrial setting with other workers in green jackets. A white geometric graphic consisting of overlapping hexagons is overlaid on the left side of the image.

DEMAND DRIVERS



GROWTH OF E-COMMERCE PLATFORMS

Grocery consumption and omnichannel distribution

GROCERY CONSUMPTION AND OMNICHANNEL DISTRIBUTION

Koreans are already the leading online purchasers of food in Asia Pacific. Korean Statistical Information Service (KOSIS) data show that domestic online grocery sales amounted to KRW 4.9 trillion in 2015, surged to KRW 10.2 trillion in 2017 and reached KRW 13 trillion last year. The portion of grocery sales in total online sales also increased from 7.9% in 2014 to 11.7% in 2018. The average figure for Asia Pacific is below 5%.

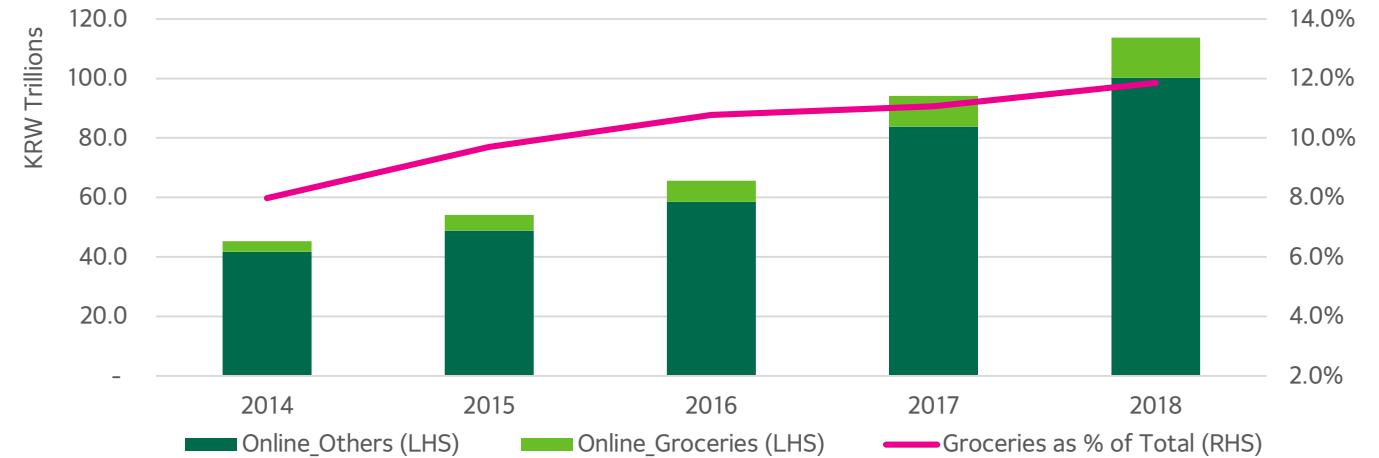
Online sales increased from KRW 45 trillion in 2014 to KRW 114 trillion in 2018, representing a CAGR of 26%. Online grocery sales recorded a CAGR of 39% during the same period, mainly due to mobile grocery sales, which increased by 61%.

The total revenue of e-commerce platforms such as Coupang, E-bay Korea, and G-market increased by 15-20% between 2014-2018, while their grocery sales increased by 30-40%. Hypermarts including E-mart and Shinsegae have recorded similar results, with growth in online grocery sales tending to be around 10%pts higher than total revenue growth.

GROWTH OF OVERNIGHT DELIVERY AND HMR

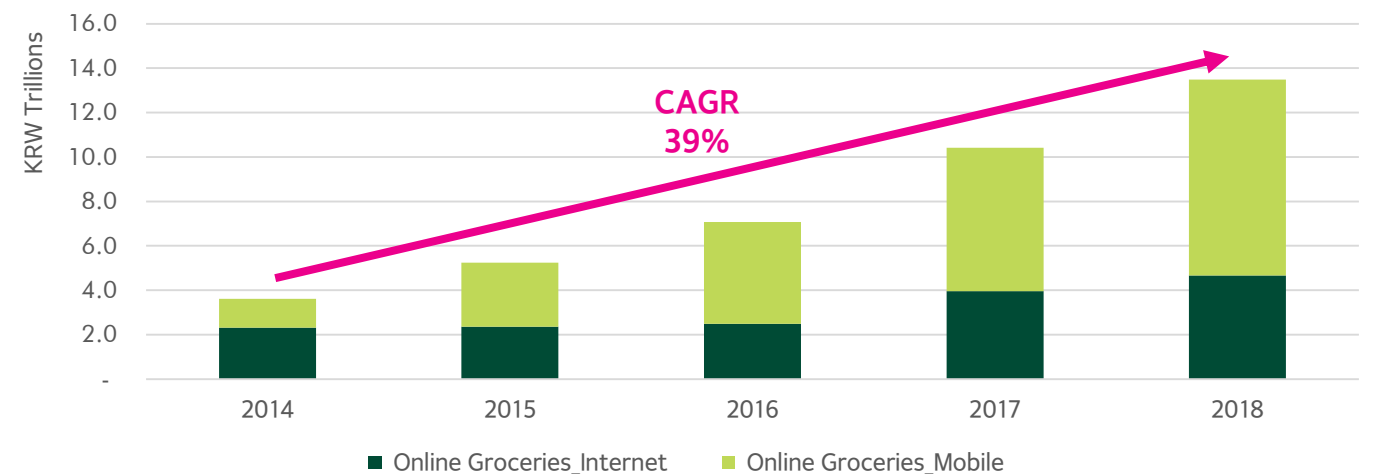
Online grocery sales are usually delivered overnight or within 24 hours. E-commerce companies, department stores, home shopping companies, hypermarts and food manufacturers have all entered the overnight delivery market in Korea in recent years.

FIGURE 4: ONLINE GROCERY SALES AS A % OF TOTAL ONLINE SALES



Source: Korea Statistical Information Service

FIGURE 5: MOBILE GROCERY SALES AS A % OF TOTAL ONLINE GROCERY SALES



Source: Korea Statistical Information Service



GROWTH OF E-COMMERCE PLATFORMS

Growth of overnight delivery and home meal replacement

The Korea overnight delivery market was worth around KRW 400 billion in 2018, a huge increase on the KRW 10 billion recorded in 2015. The entry of offline-oriented conglomerates to the market is expected to propel the market to KRW 800 billion this year, twice that of 2018.

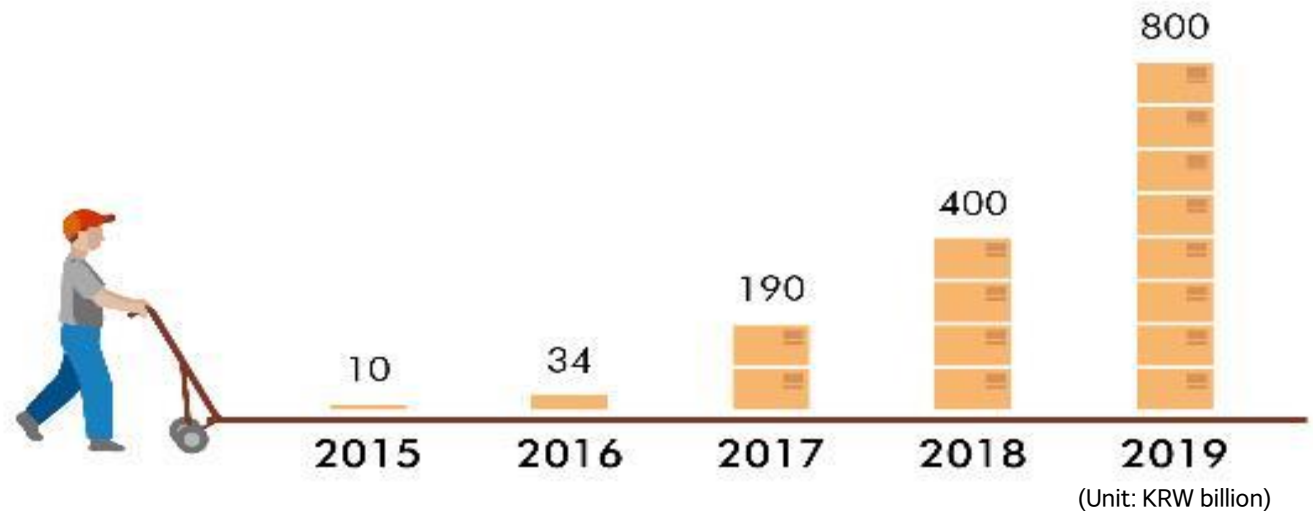
The increasing popularity of Home Meal Replacement (HMR) - food that is already fully prepared and can be consumed immediately or reheated for later - is also intensifying competition in the delivery market. According to the Ministry of Agriculture, Food and Rural Affairs, HMR sales in Korea have grown by an average of 30% y-o-y since 2016, reaching KRW 3.0 trillion in 2018.

The growth of overnight delivery and HMR will generate robust demand for cold storage in Greater Seoul, with some operators already developing their own cold storage facilities. Market Kurly, a leader in the domestic overnight delivery market, operates a cold storage hub in Seoul LOASIS and also occupies 8,000 pyeong of cold storage space in Namyangju. The company is also reportedly planning to take up 27,000 pyeong of cold storage space next year in Gimpo.

Lotte Supermarket has adopted a night delivery system that delivers products to customers by midnight if they order before 9pm. The company has also opened new Lotte Fresh Centres in Busan, Euiwang and Namyangju this year and now operates 18 centres across the country.

Due to the high cost of packaging, transportation and storage infrastructure, overnight delivery is still confined to the Greater Seoul metropolitan area. However, rapid growth in this segment is expected to drive demand for cold storage nationwide.

FIGURE 6: OVERNIGHT DELIVERY MARKET SCALE AND BEGINNING OF THE SERVICE BY COMPANIES



Source: CBRE Research, Oct 2019.



STRUCTURAL CHANGE

Increase in single-person households and double-income families

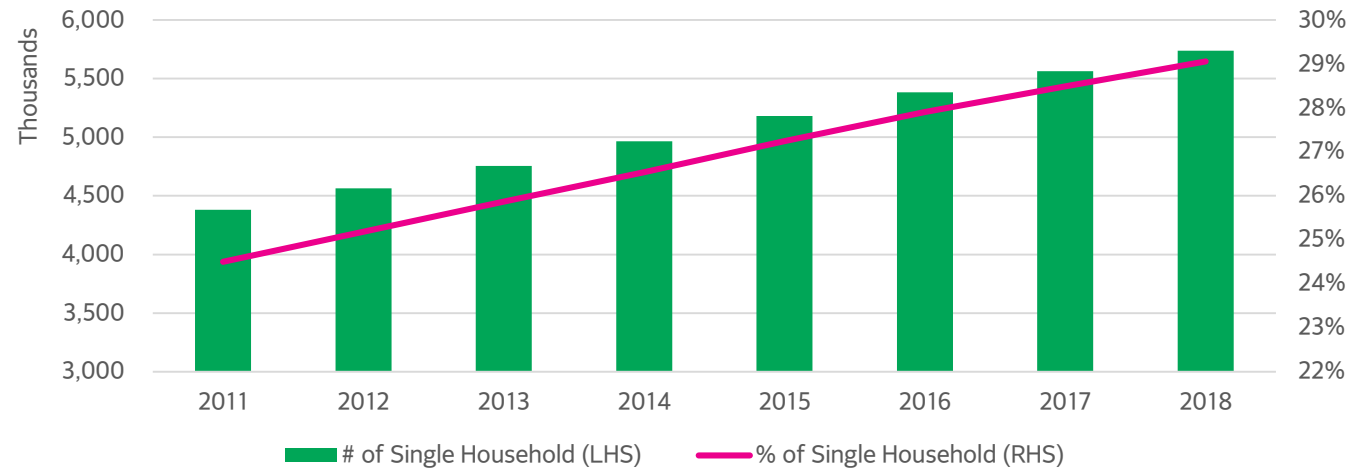
INCREASE IN SINGLE-PERSON HOUSEHOLDS AND DOUBLE-INCOME FAMILIES

The tendency for young Koreans to postpone marriage is driving an increase in the number of single-person households. KOSIS data show that the number of single households in Korea last year was 5.7 million, an increase of 3.2% compared to 2017. The number of single households as a percentage of total households has also increased in recent years, rising from 24% in 2011 to 29% in 2018. This societal change, along with the increasing number of double-income families, is also generating strong growth in online grocery sales.

Members of this demographic are increasingly ordering order small quantities of high-quality ingredients or ready-to-eat meal kits to be delivered before or after work. Many e-commerce companies and hypermarkets are therefore providing fresh food delivery services to meet their needs. Along with the development of new technology, the convenience of delivery and unique product range have attracted millennials, working mothers and housewives to shop for fresh food using their mobile devices.

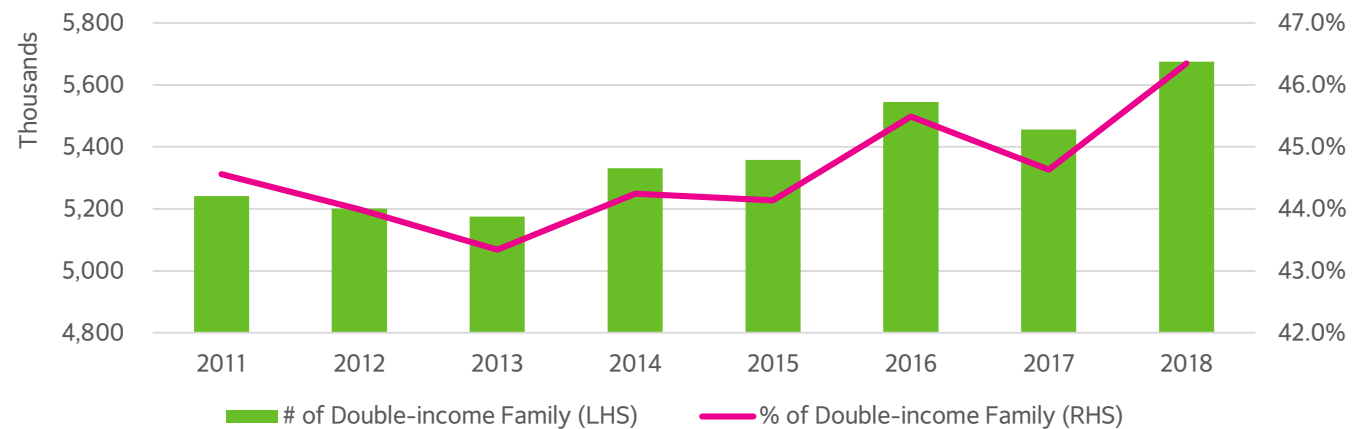
These demographic and social changes are prompting B2C e-commerce companies and 3PL firms to secure modern logistics centres with sophisticated supply chains and large storage spaces. CBRE expects the coming years to see the redevelopment/conversion of old dry logistics centres to modern cold storage facilities as demand for cold storage increases and the availability of appropriate industrial land diminishes.

FIGURE 7: NUMBER & PROPORTION OF SINGLE HOUSEHOLD



Source: Korea Statistical Information Service

FIGURE 8: NUMBER & PROPORTION OF DOUBLE-INCOME FAMILY



Source: Korea Statistical Information Service



STRUCTURAL CHANGE

Increase in wine consumption

INCREASE IN WINE CONSUMPTION

The increasing popularity of Hon-sul (drinking alone) or Hon-bab (eating alone) have led to a rise in domestic wine consumption. Korea's wine imports continue to increase. Total wine consumption is expected to increase from 3.8 million boxes in 2016 to 4.1 million boxes in 2021, led by growth in sparkling wines. Along with traditional 750 ml wine bottles, half bottles or single-cup wines are recording strong sales.

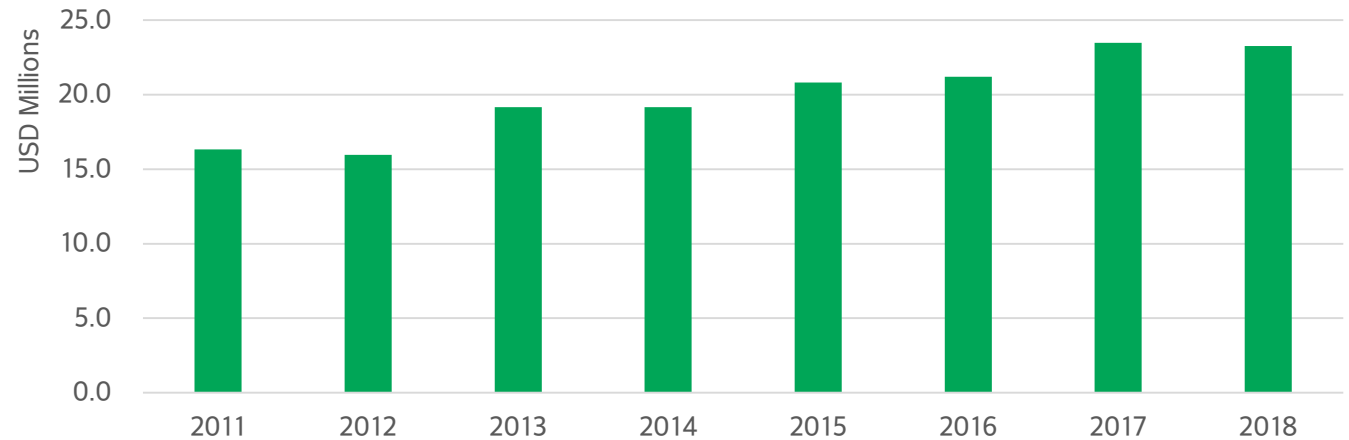
The most important thing when storing wine is temperature management, as different types of wine require different temperature from 8 to 20 degrees. Wine requires constant temperature and humidity, and some special wines are stored separately in cellars.

As wine size and type become more diverse and consumption continues to rise, demand for cold storage capable of handling such a temperature-sensitive product is expected to increase.

GROWTH IN HEALTHCARE DEMAND

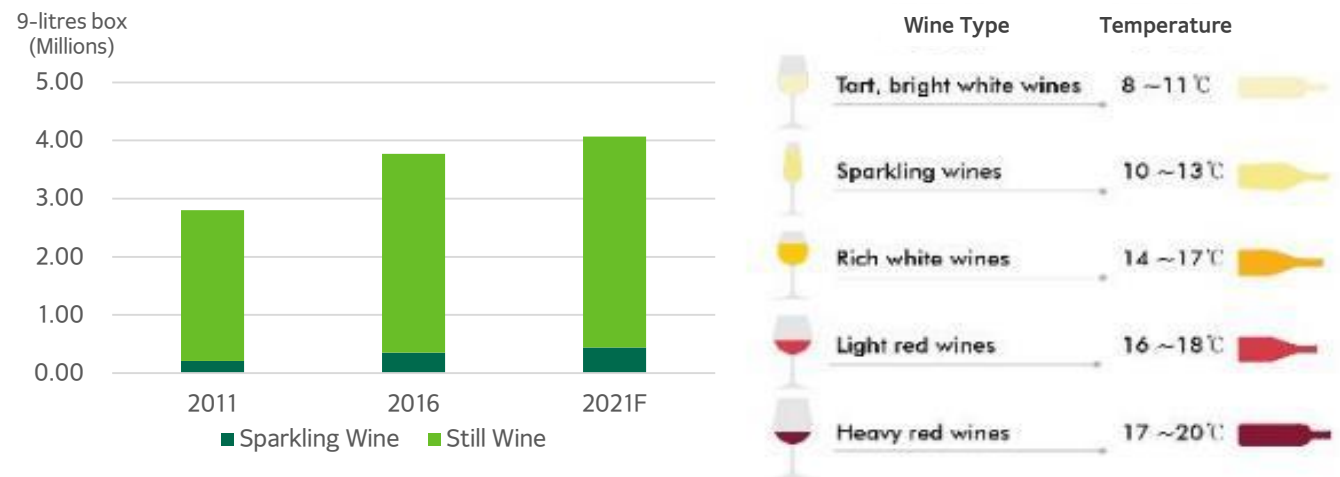
Korea's population is ageing rapidly. KOSIS data show that persons 65 years or older presently account for 15% of the total population but this figure is expected to exceed 25% by 2030 and 40% by 2060. Figures provided by the Korea Institute for Health and Social Affairs (KIHASA) show that that Korea recorded the highest growth in medical expenses worldwide between 2005 and 2015 at 7% per annum.

FIGURE 9: WINE IMPORTS (USD)



Source: Korea International Trade Association

FIGURE 10: DEMAND AND TEMPERATURE REQUIREMENTS BY WINE TYPE



Source: Vinexpo, CBRE Research



STRUCTURAL CHANGE

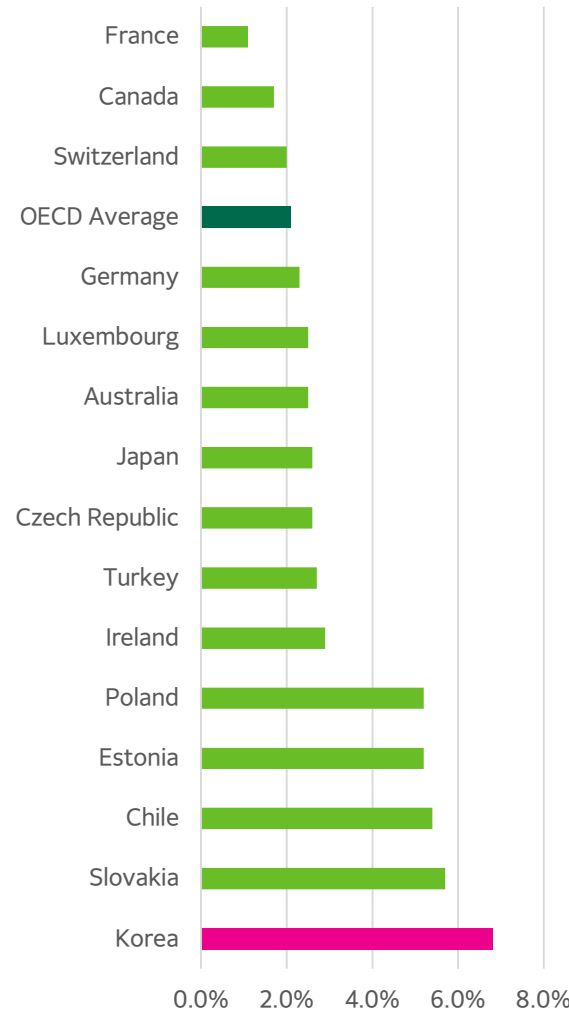
Aging population and growing concern for health

Longer life expectancy is leading to a rise in illnesses and ailments associated with old age and resulting in higher consumption of healthcare products. Ministry of Food and Drug Safety data show that the domestic drug market reached KRW 20 trillion for the first time in 2016, accounting for 1.15% of GDP. Pharmaceutical market growth is generating strong demand for storing and transporting temperature-sensitive healthcare products.

Medical products must be stored under specified temperatures and humidity, with other factors such as sterility, vibration and light also considered critical. In 2018, more than USD 300 billion of biopharmaceutical sales worldwide required cold storage, a figure expected to grow by more than 8% per year by 2023, double the growth rate of conventional drugs.

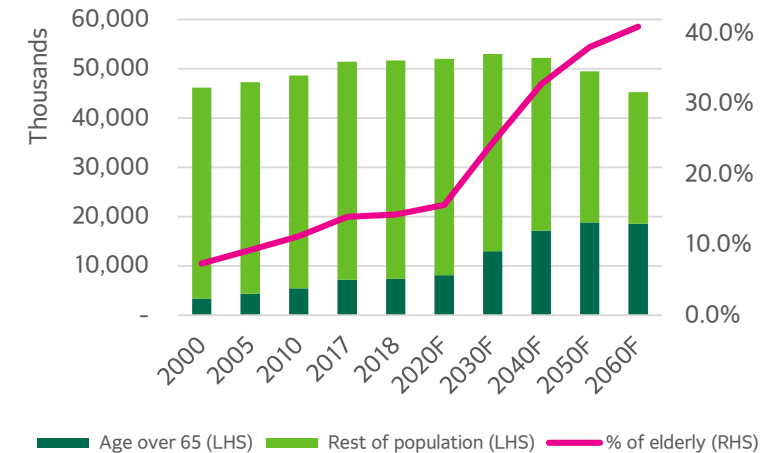
Although local pharmaceutical companies have long competed for logistics space, recent years have seen cold storage and delivery quality increase in importance. Boolim Pharmaceuticals recently constructed its own logistics centre with cold storage on every floor, while Geo-Young is reportedly planning to adopt a network of cold storage facilities for pharmaceutical distribution. Distribution companies are also developing more sophisticated drug delivery services, with the expectation that expensive pharmaceuticals will be continuously launched by multinational pharmaceutical companies.

FIGURE 11: MEDICAL EXPENSE GROWTH (CAGR, 2005-2015)



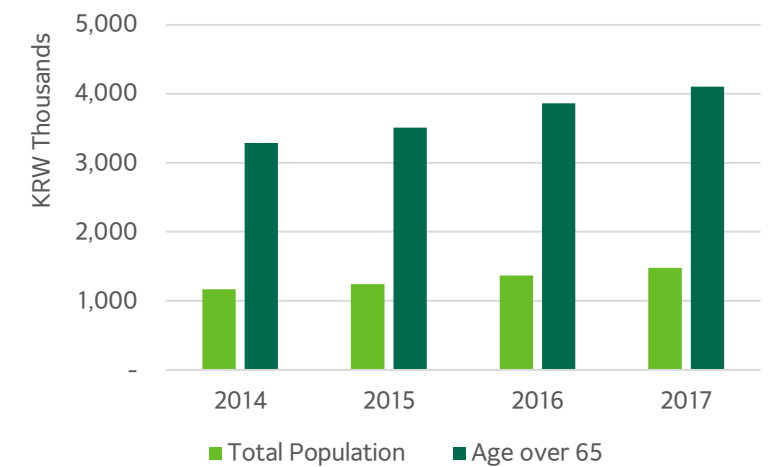
Source: KIHASA

FIGURE 12: ELDERLY POPULATION (OVER 65)



Source: Korea Statistical Information Service

FIGURE 13: ANNUAL MEDICAL EXPENSE (PER CAPITA)



Source: Korea Health Insurance Service



GROWTH POTENTIAL

The Global Logistics Performance Index

Korea ranked 25th in the World Bank’s 2018 Global Logistics Performance Index (LPI). The LPI is an indicator that ranks countries’ logistics industries based on six criteria; International shipments, infrastructure, customs, logistics competence, tracking and tracing, and timeliness.

According to the Global Cold Chain Alliance, Korea’s cold-chain capacity per urban capita stood at 0.3 cubic meters in 2018, a figure far lower than that in other developed countries such as the Netherlands and the U.S.

While Korea has a considerable demand for cold-chain logistics, most of its major technologies are owned by SMEs and are not advanced. In addition, there is still a lack of guidelines or standards for cold-chain infrastructure in Korea. In response, the industry is preparing standards like ‘food cold-chain transportation service guidelines’ or ‘protocol for real-time data collection of internet-based fresh food logistics’ to educate cold-chain.

Forrester predicts that the Asia Pacific online grocery market will grow by 26.5% every year to 2023. As Korean national income increases, demand for fresh food will rise in tandem, thus resulting in the need for sophisticated cold storage facilities.

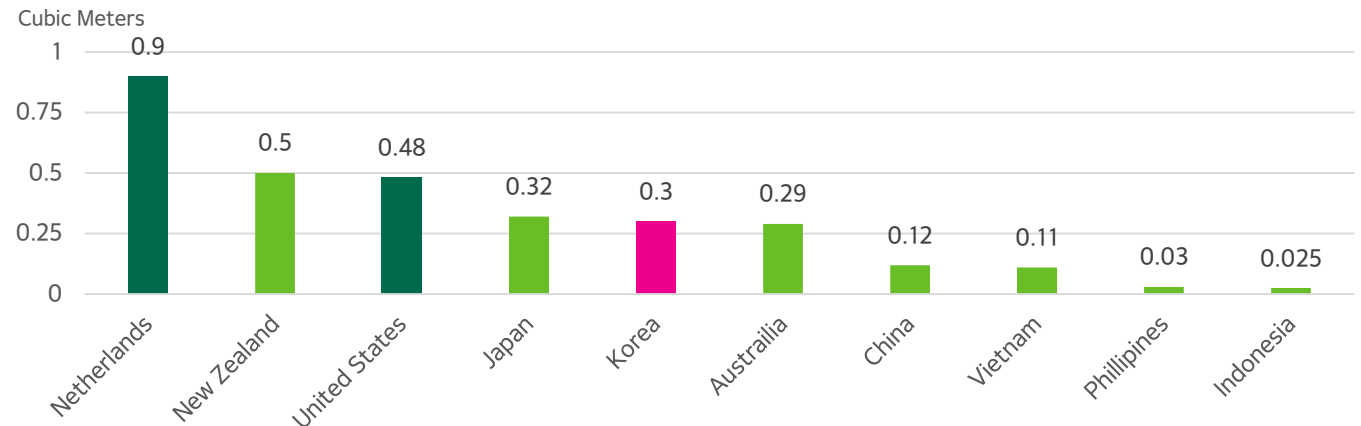
Data on the market size of the Korean cold storage market is still relatively confined to the food sector. However, true demand for cold storage likely exceeds current data amid increasing requirements from the biotech, paint, chemicals and semiconductor industries.

FIGURE 14: LPI RANKINGS

COUNTRY	2018		2016 Rank	Year	Rank (Korea)	Score
	Rank	Score				
Germany	1 (—)	4.20	1	2007	25	3.52
Sweden	2 (▲1)	4.05	3			
Belgium	3 (▲3)	4.04	6	2010	23	3.64
Austria	4 (▲3)	4.03	7			
Japan	5 (▲7)	4.03	12	2012	21	3.7
Netherlands	6 (▼2)	4.02	4			
Singapore	7 (▼2)	4.00	5	2014	21	3.67
Denmark	8 (▲9)	3.99	17			
United Kingdom	9 (▲1)	3.99	10	2016	24	3.72
Finland	10 (▲5)	3.97	15			
Korea	25 (▼1)	3.61	24	2018	25	3.61
China	26 (▲1)	3.61	27			
Taiwan	27 (▼2)	3.60	25			

Source: World Bank

FIGURE 15: REFRIGERATED WAREHOUSE CAPACITY PER URBAN CAPITA



Source: Global Cold Chain Alliance

MARKET OVERVIEW





GREATER SEOUL LOGISTICS SUPPLY

Greater Seoul cold storage

A total of 127 Grade A logistics centres providing 7 million sq. m. of space were operating in the Greater Seoul area as of the end of Q3 2019. Grade A logistics facilities are typically over 10,000 pyeong (33,000 sq. m.) and are classified according to factors such as GFA, completion year, proximity to interchange, tenant mix, and overall quality. The main logistics hub in Greater Seoul is to the south of the city in areas such as Icheon and Yongin and is home to around 40% of total GFA.

Dry warehouses have long comprised the bulk of logistics supply in Greater Seoul as they cater to relatively simple tenant demand and can command a reasonable yield. However, growing demand for cold storage is prompting more developers to construct mixed and pure cold assets.

Pure cold storage supply in Greater Seoul remains limited due to relatively high construction costs, higher technical requirements and overall weaker demand compared to dry properties. CBRE's analysis of 40 pure cold storage facilities in Greater Seoul found that each property had an average GFA of just under 5,000 pyeong and were mostly old assets built more than 15 years ago, and occupied by end users. Although dry assets dominate in number, mixed assets comprise the largest segment of the market in terms of average GFA, mainly due to the recent completion of several large sized mixed properties.

Apart from traditional logistics hubs, mixed assets tend to be developed in cities near Korea's west coast such as Hwaseong and Pyeongtaek, where imported refrigerated products are offloaded at ports. Other sites include cities in close proximity to Seoul, such as Gimpo, Bucheon and Namyangju, where last-mile deliveries for fresh food are made.

FIGURE 16: GRADE A LOGISTICS CENTERS SUPPLY IN GREATER SEOUL



Source: CBRE Research, Oct 2019.



NATIONWIDE COLD STORAGE

Capacity and years in operation

According to the National Federation of Fisheries Cooperatives, there were approximately 770 cold storage facilities in Korea in 2017.

Of these, only 11% can accommodate more than 10,000 tonnes of produce, meaning that they are much smaller than dry assets. Cold storage facilities are mainly located near Busan port, where marine products and groceries are imported in bulk. In the Greater Seoul region, Gyeonggi province is home to several cold storage facilities that can store more than 10,000 tonnes. Logistics capacity of cold storage is essential since companies using such assets are growing rapidly and prefer to use one large size facilities as opposed to several smaller ones.

More than 90% of cold storage facilities in Korea were constructed over six years ago. Assets located in traditional logistics hubs like Gyeonggi province or Busan tend to be large in size but are relatively older. Relatively newer hubs such Incheon and Jeju are home to more modern properties.

FIGURE 17 : COLD STORAGES SUPPLY IN KOREA



Source: National Federation of Fisheries Cooperatives (769 centers by the end of 2017)

A large industrial facility, likely a warehouse or processing plant, featuring rows of white shelving units on wooden pallets. The ceiling is white with several large black fans and fluorescent lighting fixtures. The overall atmosphere is clean and organized.

LEASING & INVESTMENT



LOGISTICS INVESTMENT MARKET

Increase in volume due to active institutional investors

Since 2010, the rapid expansion of e-commerce has stimulated the development of several large-scale logistics centres in the Greater Seoul area.

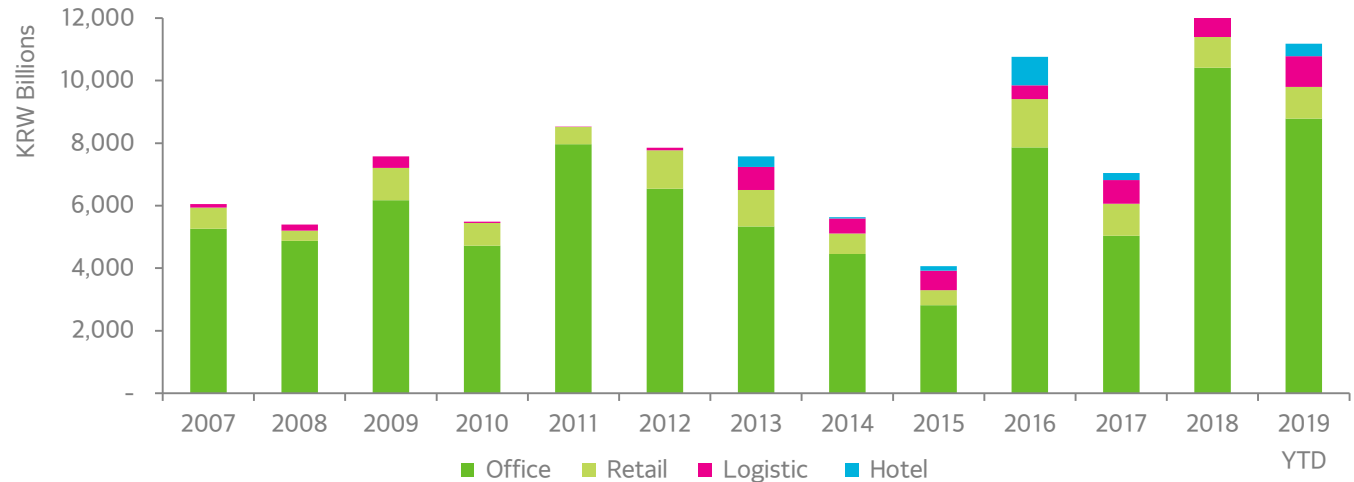
Growing investment demand has pushed up transaction volume for logistics assets by an average of 30% y-o-y for the past five years. Logistics transaction volume reached KRW 1.3 trillion in 2018, representing growth of 69% y-o-y. The market has remained robust this year, with transaction volume reaching KRW 980 billion as of the end of Q3 2019.

Logistics transactions were traditionally dominated by end-users but since 2015 institutional investors – including numerous major groups from overseas – driven purchasing activity. Foreign capital has accounted for around 76% of institutional investment in Korean logistics properties over the past five years, well above the figure for other property asset classes. However, local capital has turned more active this year, accounting for around 50% of logistics transaction volume as of the end of Q3 2019.

Recent years have also seen some investors develop their own logistics centres in search of higher returns. These include Kendall Square, which has developed several large logistics centres in western areas of Greater Seoul including Bucheon and Goyang; and IGIS Asset Management Company, which recently raised development funds to develop its own logistics centre.

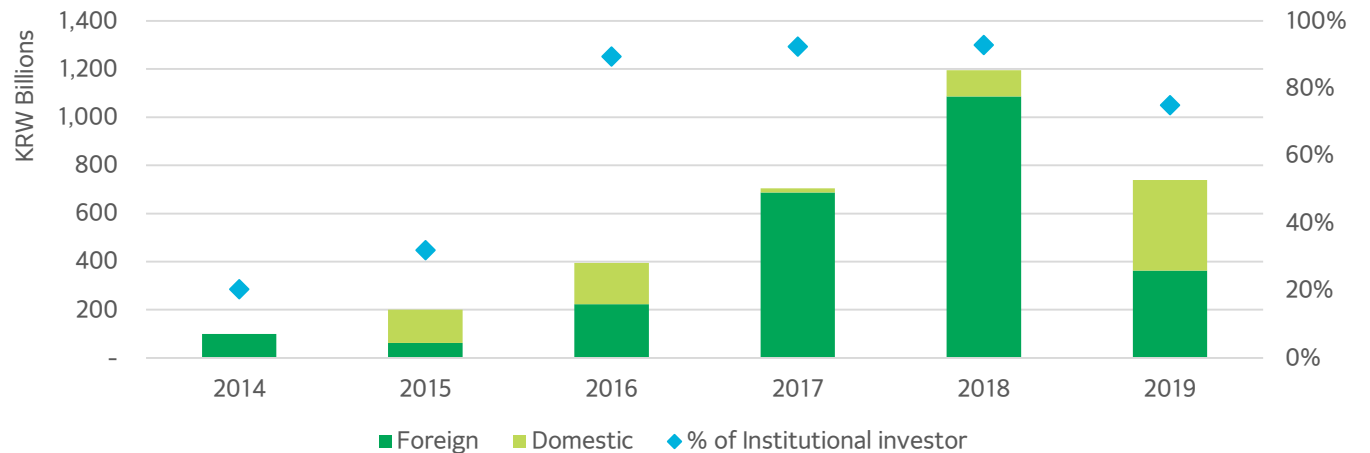
Investment demand for logistics centres in Greater Seoul is expected to increase in the coming years as more investors purchase existing assets, engage in pre-sales and pursue development opportunities.

FIGURE 18: COMMERCIAL REAL ESTATE TRANSACTION VOLUME (2007-2019 YTD)



Source: CBRE Research, Oct 2019.

FIGURE 19: LOGISTICS TRANSACTION VOLUME AND ORIGIN OF CAPITAL BY INSTITUTIONAL INVESTORS



Source: CBRE Research, Oct 2019.



LOGISTICS INVESTMENT MARKET

Transaction volume by asset type

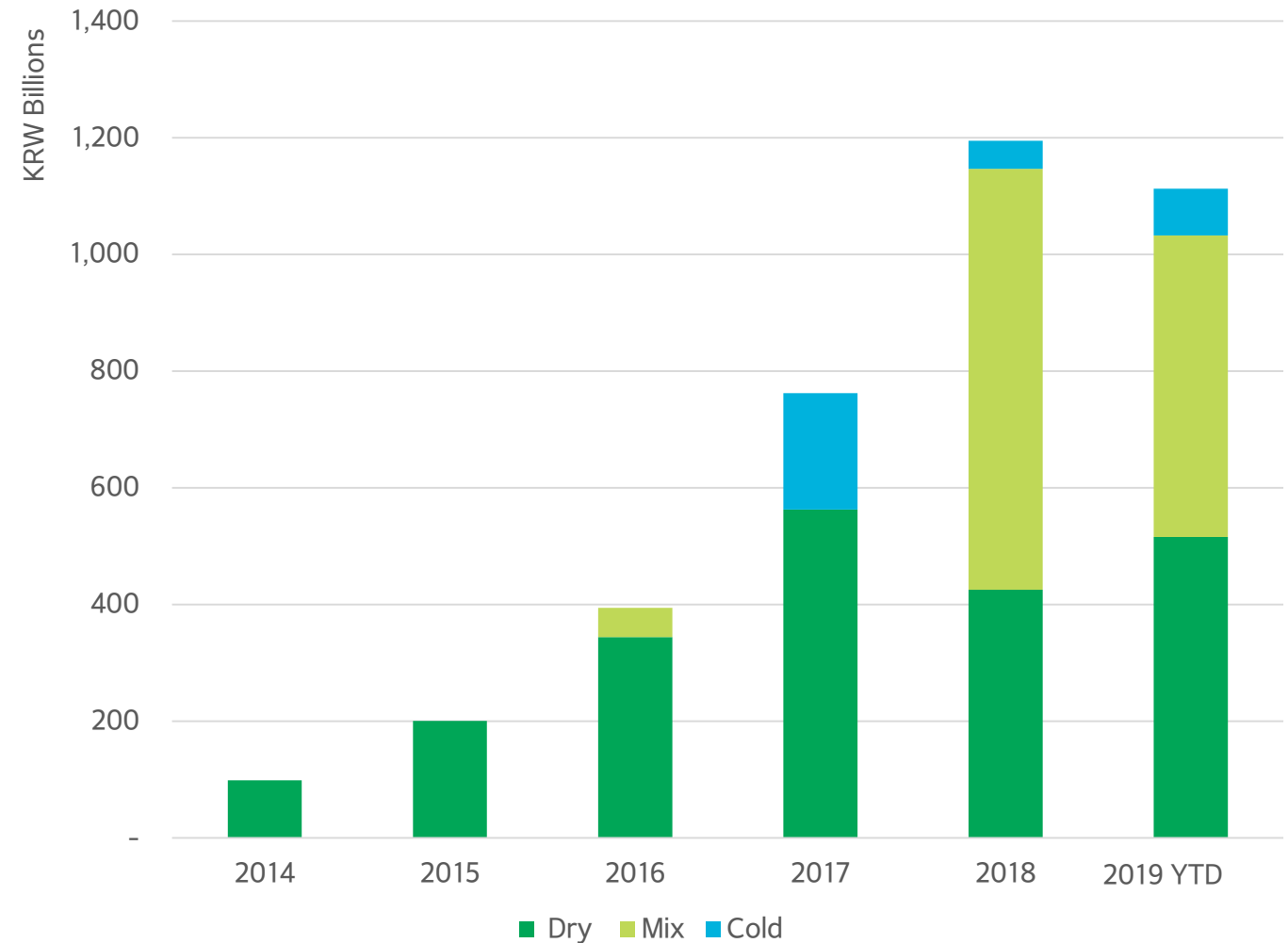
RCA data show that the investment turnover of cold storage facilities comprised just 5% of total industrial transaction volume in Asia Pacific between 2014 and 2018.

In the domestic cold storage investment market, investment activities began to gradually be observed in 2013 as liquidation of fresh distribution centres owned by domestic supermarkets took place. Still, cold storage accounts for just 9% of total logistics transaction volume in Korea over the past five years.

More recently, new supply of large-scale logistics complexes and the growth of the fresh food delivery market has led to an increase in transactions for mixed assets that combine dry and cold facilities. Examples include Hwaseong-Dongtan Logistics Complex, which fetched a record high price for a logistics asset in Korea when it was transacted for KRW 600 billion in 2018.

Rapidly expanding fresh food delivery market and intense competition for delivery quality among retailers are expected to generate huge demand for cold storage in the coming years. This phenomenon is expected to generate more cold supplies and thus more cold asset transactions.

FIGURE 20: LOGISTICS TRANSACTION VOLUME BY ASSET TYPE



Source: CBRE Research, Oct 2019.



PURE COLD STORAGE DEVELOPMENT

Although demand for cold storage is growing rapidly, the supply of large sized modern pure cold storage in the Greater Seoul area remains limited.

New large-scale logistics properties tend to be developed as mixed assets, although some are solely comprised of cold storage. The proportion of space allocated to cold storage in newly supplied mixed assets stands at around about 30%, which is regarded as a rate that can best absorb current demand for cold storage while offering higher profitability. The proportion of cold storage tends to be higher in assets located closer to Seoul.

Four of the eight new Grade A logistics facilities competed in 2018 were mixed assets and had average GFA of 100,000 sq. m. or more. In addition, some dry assets under construction changed construction plans to include cold storage facilities. CBRE expects this development trend to continue, with a significant percentage of new supply anticipated to consist of mixed assets. If all assets planned for future development are supplied, total GFA of Grade A logistics centers in Greater Seoul will reach 8.6 million sq. m. by 2020, a 50% increase from 2018.

Recent major pure cold storage facilities completed in Greater Seoul include Kendall Square Bucheon Cold-Chain Park (GFA 58,100 sq. m.), which came on stream in Q3 2019. The pipeline also features Hwaseong-Dongtan Logistics Complex Block C (GFA 102,500 sq. m.) and Yongin Logistics Center (GFA 165,300 sq. m.).

FIGURE 21: GREATER SEOUL GRADE A LOGISTICS SUPPLY





COLD STORAGE LEASING

General terms and conditions

Cold storage takes longer to lease out and stabilise compared to traditional dry warehouses due to the smaller pool of potential tenants. However, vacancy risk can be offset by the fact that occupiers of cold storage are willing to commit to longer lease terms as they prefer to remain in the same facility for long periods and often find it challenging to find alternative options suited to their requirements.

In recent years intense competition between fresh food delivery companies has prompted many occupiers requiring cold storage in strategic locations to enhance their delivery capabilities in metropolitan areas. Once they find these logistics spaces, they tend to make long term contracts to secure the space to act as relative advantage over competitors.

The typical lease term for cold storage is between 5 to 10 years and includes a fixed rental escalation every year or CPI-linked rental increase.

While landlords of dry warehouses typically subdivide space for use by multiple tenants, cold storage has a relatively higher percentage of master lease contracts as it is challenging for occupiers to find similar facilities. However, as future supplies are projected to get bigger, cold storage will also witness more multi-tenant assets.

Given that cold storage facilities are often custom designed and built and let to a single occupier on a long lease, tenant credibility is another critical factor investors must consider.

FIGURE 22: GENERAL LEASE TERMS AND CONDITIONS

	Dry Warehouse	Cold Warehouse
Lease Period	Average 2-5 years	Average 5-10 years
Minimum Lease	Negotiable (Usually 2 years)	Negotiable (Usually 2-3 years) In case of conversion, usually 5 years
Renewal	Various renewal options according to lease conditions	Various renewal options according to lease conditions
Rent	Gross area	Gross area
Rent-free	Negotiable (Usually one month per two years)	Negotiable (Usually one month per two years)
Rent Escalation	CPI or according to lease contract	CPI or according to lease contract
Deposit	6-10 months rent (Return without interest at the end of the contract)	6-10 months rent (Return without interest at the end of the contract)
Maintenance Fee	Expenses regarding asset maintenance (e.g. common area, emergency service, etc) are included in maintenance fee. <i>(Electricity and water are individually paid by tenant)</i>	Expenses regarding asset maintenance (e.g. common area, emergency service, etc) are included in maintenance fee. <i>(Electricity and water are individually paid by tenant, but sometimes electricity is included in rent)</i>
Restoration	Tenant responsibility	Tenant responsibility

* Above information may vary depending on individual cases, thus it is advised to discuss further with a relevant professional.

Source: CBRE Research, Oct 2019.



COLD STORAGE RENTAL PREMIUM

Cold storage asking for higher rents

Despite elevated CAPEX and OPEX, cold storage facilities nevertheless command higher rental premiums than dry warehouses. Rents for cold storage in Korea are more than double those of dry warehouses. Thus, including cold storage in logistics assets can be a way to enhance profitability.

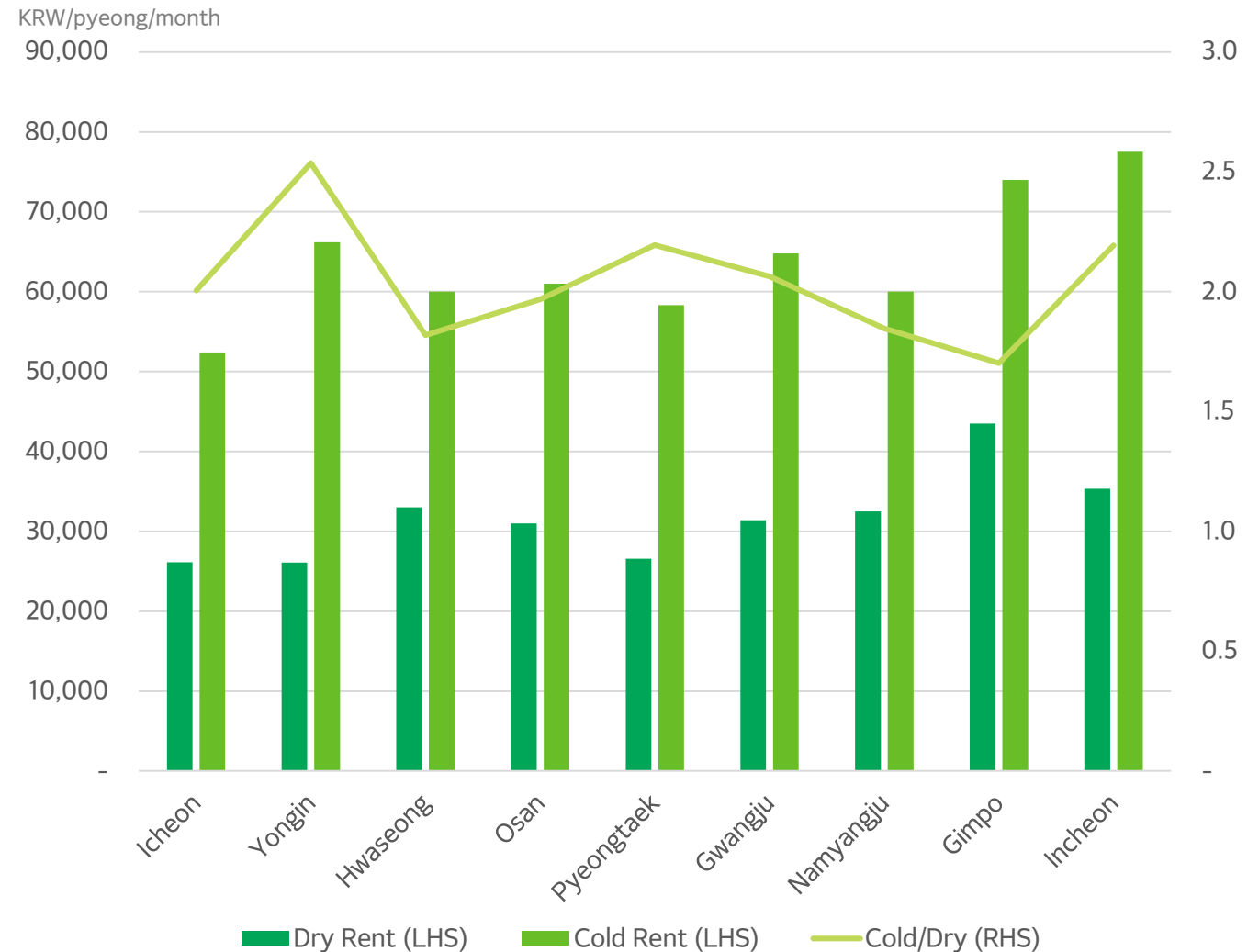
The rental gap between cold storage and dry warehouses is widest in Yongin as rents for dry warehouses are relatively low the area and the availability of cold storage assets is limited compared to demand.

Like dry assets, cold storage rents were highest in the Western region of Greater Seoul, notably Gimpo and Incheon. These cities are relatively close to Seoul and have modernized assets compared to the Southern region.

Operating expenses for cold storage are greater than those for dry warehouses due to their higher power requirements. Refrigeration accounts for more than 70% of overall electricity consumption in cold storage facilities.

Thus, investors willing to invest in cold storage assets should seek for ways to minimize operating expenses. They should prevent cracks that can change internal temperature and locate cold storage in underground floors where maintaining certain temperature is relatively easier.

FIGURE 23: LOGISTICS RENTS BY LOCATION AND TYPE OF THE ASSET



Source: CBRE Research/CBRE I&L, Oct 2019.



COLD STORAGE DEVELOPMENT

Cost and concerns

Investors seeking to build cold storage must gain a thorough understanding of the entire development process, from sourcing land to obtaining construction permits. Deep knowledge of other factors such as power requirements, fire safety, condensation prevention and insulation are also necessary.

In regions with a high concentration of logistics assets, such as Icheon and Yongin, it is vital that investors purchase land that meets the required rate of return as obtaining permission for development projects is becoming more challenging. Although it varies by region, the average construction cost of cold storage facilities in Korea is usually 1.5 times that of dry warehouses.

CONVERSION or RECONSTRUCTION

Difficulties in obtaining adequate land and the complex development process may encourage some investors to consider converting existing dry facilities to cold storage. However, the number of existing assets suitable for conversion is very limited and post-conversion maintenance can also be a challenge.

Investors can also consider redeveloping small to medium sized old dry warehouses into cold storage. CBRE expects to see the acquisition and redevelopment of such properties – especially those in strategic locations – increase in the coming years as competition for industrial land intensifies.





COLD STORAGE INVESTMENT

Cold storage investment in Asia Pacific generally offers a yield premium of 50 to 150 bps on conventional dry warehouses. The yield gap in Pacific is narrower as the investment market is more competitive.

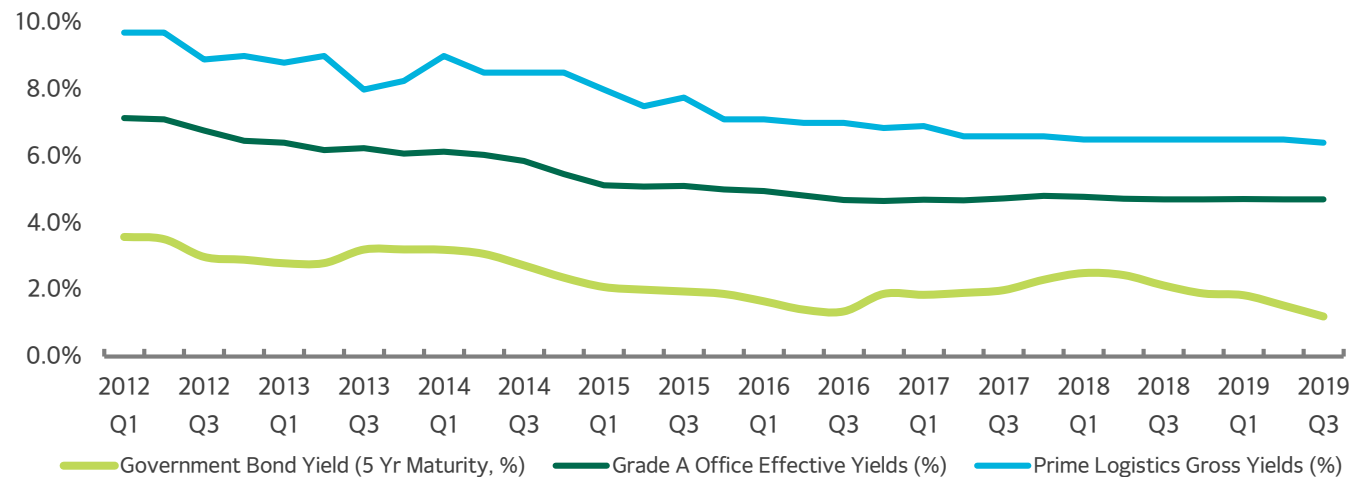
Prime logistics gross yield in Korea stood at 6.4% in Q3 2019. Considering that there is a gap of approximately 50 bps between the gross yield and cap rate, the average cap rate is expected to be set at around 6%.

Robust investment demand for logistics properties over the past five years has pushed up prices in Greater Seoul. Average yield has therefore gradually compressed but remains relatively stable compared to other major cities in Asia Pacific.

CBRE's recent analysis of various logistics transactions in Greater Seoul found that cap rates varied according to location, asset type, and lease status. Unlike other APAC countries, yield premium of cold assets in Greater Seoul was not distinct. Rather, assets in cost-effective locations and high accessibility to interchange was more sought-after. Meanwhile, several recent pre-sale cases had relatively higher cap rate as no major tenant was secured in the asset.

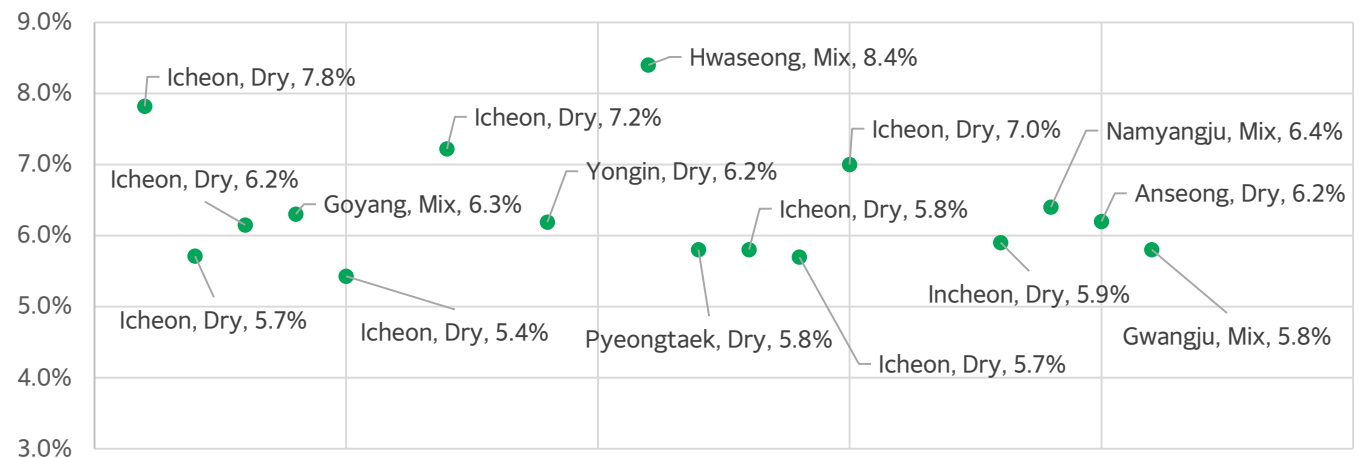
Although numerous factors affect logistics cap rates, assets in excellent locations will constantly lure investment demands, regardless of asset type.

FIGURE 24: YIELD COMPARISON



Source: CBRE Research, Oct 2019.

FIGURE 25: CAP RATES OF RECENT LOGISTICS TRANSACTION (2018-2019)



Source: CBRE Research, Oct 2019.



CONCLUSION

CONCLUSION

The growth of e-commerce due to structural change is now expanding its growth to online grocery market, fueling demand for new type of logistics asset. At the same time, competitions to deliver groceries in good quality is making retailers to seek for logistics hubs in Greater Seoul area.

CBRE Research expects increased number of fresh-food retailers and variety in products they carry to consistently create demand for cold storage. Especially, modernized cold-chain facilities that can minimize loss during distribution process will become important.

In case of those foreign/domestic investors who wish to diversify their investment channels besides office assets, not only conventional dry warehouses but also cold storage centers can be their investment option.

To minimize vacancy issues, landlords should fully understand the dynamics of cold-chain logistics such as seasonality, change in logistics volume, or tenants' needs. Investors who are willing to invest in cold storage in Korea are advised to utilize the content of this report to better understand market demands and trends.



For more information about this major report, please contact:

KOREA RESEARCH

Claire S. Choi
Head of Research, Korea
claire.choi@cbre.com

Jiyeon Lee
Manager, Korea Research
jiyeon.lee@cbre.com

Jay Lee
Analyst, Korea Research
jay.lee3@cbre.com

KOREA CAPITAL MARKETS

Sean Choi
Executive Director
sean.choi@cbre.com

Jihyun Lee
Director
Ji-hyun.lee@cbre.com

For more information regarding global research, please contact:

Richard Barkham, Ph.D., MRICS
Global Chief Economist &
Head of Americas Research
richard.barkham@cbre.com

Neil Blake, Ph.D.
Global Head of Forecast and Analytics
neil.blake@cbre.com

Henry Chin, Ph.D.
Head of Research, APAC/ EMEA
henry.chin@cbre.com.hk

Spencer G. Levy
Chairman of Americas Research
spencer.levy@cbre.com

Follow CBRE



CBRE RESEARCH

This report was prepared by the CBRE Korea Research Team, which forms part of CBRE Research—a network of preeminent researchers who collaborate to provide real estate market research and econometric forecasting to real estate.

All materials presented in this report, unless specifically indicated otherwise, is under copyright and proprietary to CBRE. Information contained herein, including projections, has been obtained from materials and sources believed to be reliable at the date of publication. While we do not doubt its accuracy, we have not verified it and make no guarantee, warranty or representation about it. Readers are responsible for independently assessing the relevance, accuracy, completeness and currency of the information of this publication. This report is presented for information purposes only exclusively for CBRE clients and professionals, and is not to be used or considered as an offer or the solicitation of an offer to sell or buy or subscribe for securities or other financial instruments. All rights to the material are reserved and none of the material, nor its content, nor any copy of it, may be altered in any way, transmitted to, copied or distributed to any other party without prior express written permission of CBRE. Any unauthorized publication or redistribution of CBRE research reports is prohibited. CBRE will not be liable for any loss, damage, cost or expense incurred or arising by reason of any person using or relying on information in this publication.

To learn more about CBRE Research, or to access additional research reports, please visit the Global Research Gateway at reports www.cbre.com/research-and-reports

CBRE