Data Centre Colocation
Hyperscale Cloud & Interconnection

DCI Report Series

MARKET: SOUTH KOREA SEOUL & BUSAN

2023

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Executive Summary

Seoul, South Korea

Seoul, South Korea is yet another market in the Asia-Pacific region that is experiencing a growth surge and quickly establishing itself as a top tier location. Seoul possesses all the core fundamentals that a major market should have. There is a critical mass of population and end users, the right cross-section of demographics, the presence of quality infrastructure and a strongly centralized structure that ensures Seoul, and supporting edge markets like Busan, will be at the centre of activity for years to come. The Seoul market was worth US$703m in 2022 and is projected to grow at a five-year CAGR of 19%.

Not surprisingly, hyperscale is a primary driver of growth in this market. The major US-based cloud platforms have converged on Seoul in recent years and are all in the process of setting up scaled in-country data centre infrastructure. While the self-build has been an option in some cases, many of the regions and AZs being built out are ending up in colocation environments, and this has spurred strategic activity from global and regional operators.

This was once a market dominated by domestic operators, with strong legacy telco presence, but now features a dynamic competitive landscape occupied by major global operators, new platforms supported by infrastructure-oriented investment vehicles and various joint ventures.

The scale and scope of the hyperscale expansion wave is substantial. The market currently has 496.3MW of built-out capacity as of 4Q22. This inventory could nearly triple based on the ~970MW of capacity that is currently in the development pipeline. Nearly all of this inventory is being built to accommodate hyperscale requirements, but there is still enterprise and retail-level demand that continues to exist. This is also expected to drive uptake in interconnection services.

The demand profile is what makes Seoul such an intriguing market. US-based hyperscalers are landing en masse, Chinese hyperscalers are present in the market and there are domestic cloud infrastructure platforms at the subscale level such as NAVER and Kakao that are growing and consuming data centre colocation capacity. South Korea also has a burgeoning domestic content industry that is propelling demand for infrastructure. Some of these content and social media platforms may procure their own infrastructure and could reach multi-MW levels sooner than later.

This report is an excellent resource for any service provider, investor or enterprise end user looking to understand and project the data centre market in Seoul or find a service provider. The methodology applied continues to be the most robust in the industry. We track supply on a space and power basis, split all the metrics along retail and hyperscale lines, and aggregate inventory in multiple tiers according to build status, absorption rates and maximum capacity levels. Hyperscale cloud nodes and on-ramps are mapped and a complete directory is provided.

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South Korea Market Demand Drivers

Impact of decentralization

The Internet's geography is changing. Companies of all sizes are deploying more network and computing infrastructure to reach more people around the world more directly. In some cases, this infrastructure is built to improve performance and cut network backhaul costs. In others, it is being built in response to growing numbers of people and businesses getting connected, driving demand for digital services and producing copious amounts of data that is stored and analysed. The development of the world's Internet infrastructure landscape has historically taken its cue from other more established industries such as the financial services and logistics verticals. These industries have been known to generate economies of scale through centralising their core ecosystem within a select few global markets. For financial services, the London, Singapore, Hong Kong, Tokyo, Frankfurt and New York markets have long been seen as the top financial and economic hubs in the world. Those markets therefore have also been natural logistics, import and export hubs, given how the flow of capital impacts industries that are especially capital-intensive. The data centre and network infrastructure sectors are no exception to this trend, and global tier 1 markets such as London, Singapore, Hong Kong and Tokyo have grown to become the Internet's first layer of aggregation points where international submarine cable systems and data centre infrastructure naturally gravitated towards. This has created a centralization effect in order to take advantage and build upon the economies of scale and ecosystem benefits of being able to access a variety of other locations and markets from a single location. To bring this closer to home, think about the compounding effect of retail outlet malls versus single store locations. Would a consumer prefer to drive 20 minutes to access a single retail store? Or would they rather drive a little bit longer to a mall where they can access many different stores and brands all under one roof? In that same vein, centralization is a crucial step to generate strong ecosystems and develop network effects for the end user.

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As the Internet infrastructure landscape continues to mature, and has experienced both sustained and accelerating levels of adoption and usage on a global scale, the benefits of centralization now come with certain glaring weaknesses from resiliency, redundancy, performance and regulatory perspective. These factors have driven a new wave of investments and development activity outside of the traditional global tier 1 markets that are now experiencing elevated levels of land and power constraints given the high level of population density residing within these economic and infrastructure hubs.

And this is core underlying trend for the Seoul and Busan markets being positioned as a destination for the next wave of digital infrastructure deployments and investments in the Asia-Pacific region.

Location

Seoul serves as the business hub and capital of South Korea with the population within the Seoul metropolitan area accounting for 26 million (or half) of South Korea's total estimated population of around 52 million people. Access to enterprise end users are a meaningful driving factor for hyperscalers to deploy their data centre capacity within close proximity to densely populated markets. Given the amount of data centre development pipeline within the greater Tokyo market, which shares similarities in terms of enterprise and population concentration to Seoul, it becomes a vital location for hyperscalers to invest in and deploy their cloud infrastructure regions.

Demand Drivers Continued

Connectivity

The Seoul and Busan markets are tied together closely given that Busan is the primary hub for international Internet bandwidth/connectivity and serves as a termination point for over nine international submarine cable systems with an additional two more cables under development. These submarine cable systems connect back into the Seoul market via terrestrial fibre cables that are largely owned by domestic telecom providers.

Infrastructure

Robust network and reliable power infrastructure. Grid is stable and power outages are rare, making it an ideal location for setting up data centres. Seoul as a market is ranked as home to one of the world's fastest Internet speeds, and this is a reflection of the overall infrastructure quality that make it an attractive destination for data centres.

Political climate

Stable and fair government centered around promoting economic development. Data centre segment could potentially benefit from South Korea opening its doors for international investment. There has recently been increasing scrutiny surrounding the data centre sector in Seoul, with residents protesting the development of data centres in close proximity to their homes and the recent major outages from Kakao has led to discussions about the importance and potential impact and risk to national security that data centres have as more and more companies and government sectors move towards cloud computing and widespread adoption of digital infrastructure.

Business climate

Skilled labour force, relatively friendly environment for international business. Language and cultural barriers are present that require local Korean presence to do business in-country effectively. Strong culture of IT outsourcing with the presence of established local systems integrators driving data centre and cloud services adoption.

Geographical stability

Relatively low risk of catastrophic natural disasters. Natural disasters categories that are relatively common in Seoul include typhoons, floods, droughts, landslides, snowstorms, tsunamis and earthquakes. Heavy rainfall and typhoons are the most frequent and destructive. Two-thirds of these disasters typically occur in the summer months, between June and September, when the monsoon season brings heavy rainfall that often triggers flooding and landslides in the country's mountainous landscape. In July and August, typhoons originating east of the Philippines frequently travel towards the Korean Peninsula.

Hyperscale

Continues to be the primary driver of data centre colocation leasing in the greater Seoul market as public cloud adoption continues to accelerate and hyperscale providers find it necessary to deploy data centre infrastructure in-country to serve local end users effectively. While AWS, Google and Microsoft have shown they have the ability and appetite to develop self-built data centres, other hyperscale cloud providers like Alibaba, IBM Cloud and Tencent have opted to lease their data centre infrastructure exclusively from colocation providers. Currently only Kakao and NAVER have self-build data centres in the Greater Seoul area, while Microsoft has a self-build data centre campus in the Busan market.

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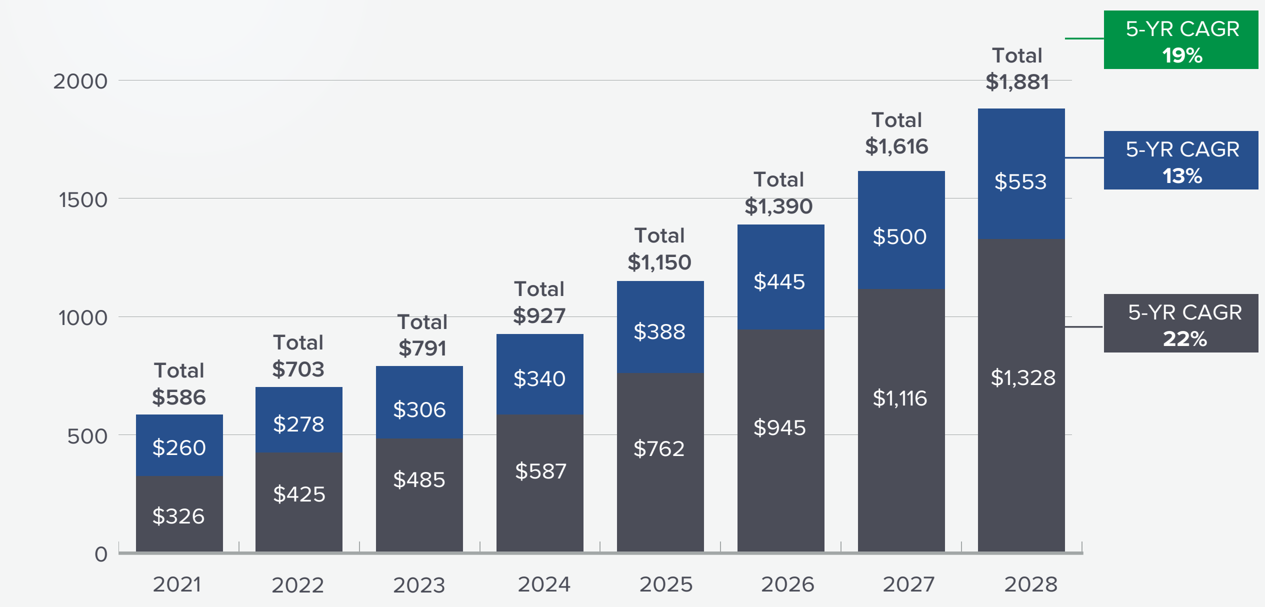
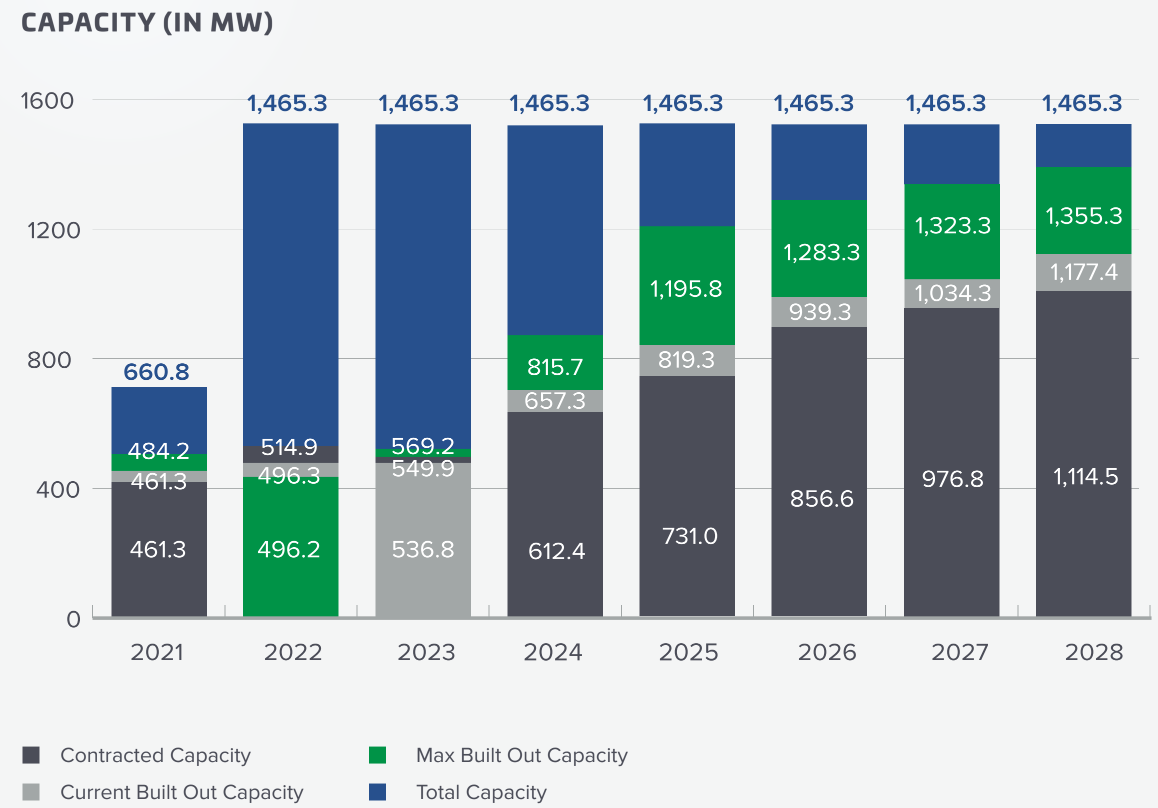
Strong culture of IT outsourcing with the presence of established local systems integrators driving data centre and cloud services adoption.

Seoul Data Centre Colocation
Market Size(in US$ Millions)

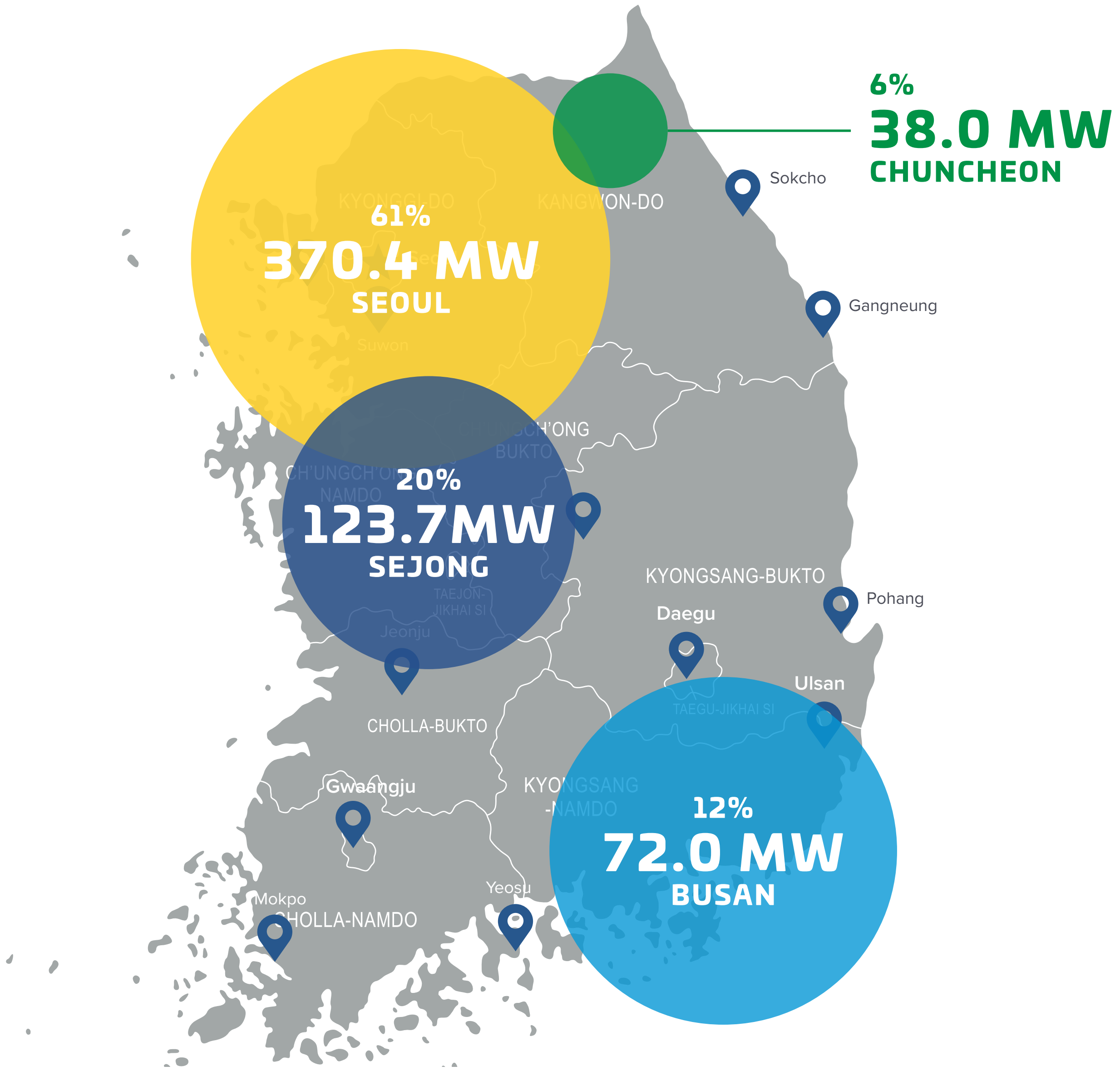


Seoul Critical MW Market Size
Total Colocation Market



Note, for 2022, Contracted Capacity is greater than Current Built Out Capacity, Current Built Out Capacity is greater than Max. Built Out Capacity. For 2023, Contracted Capacity is greater than Current Built Out Capacity.

South Korea
Hyperscale Capacity Distribution by Region



604.1 MW Total Hyperscale Capacity	**340.4 MW** Leased Colocation Capacity	**263.7 MW** Self Build Capacity

Economic Review

> Now agreeing with both the Bank of Korea and the Ministry of Economy and Finance and behind the expected global growth rate of 2.6%.

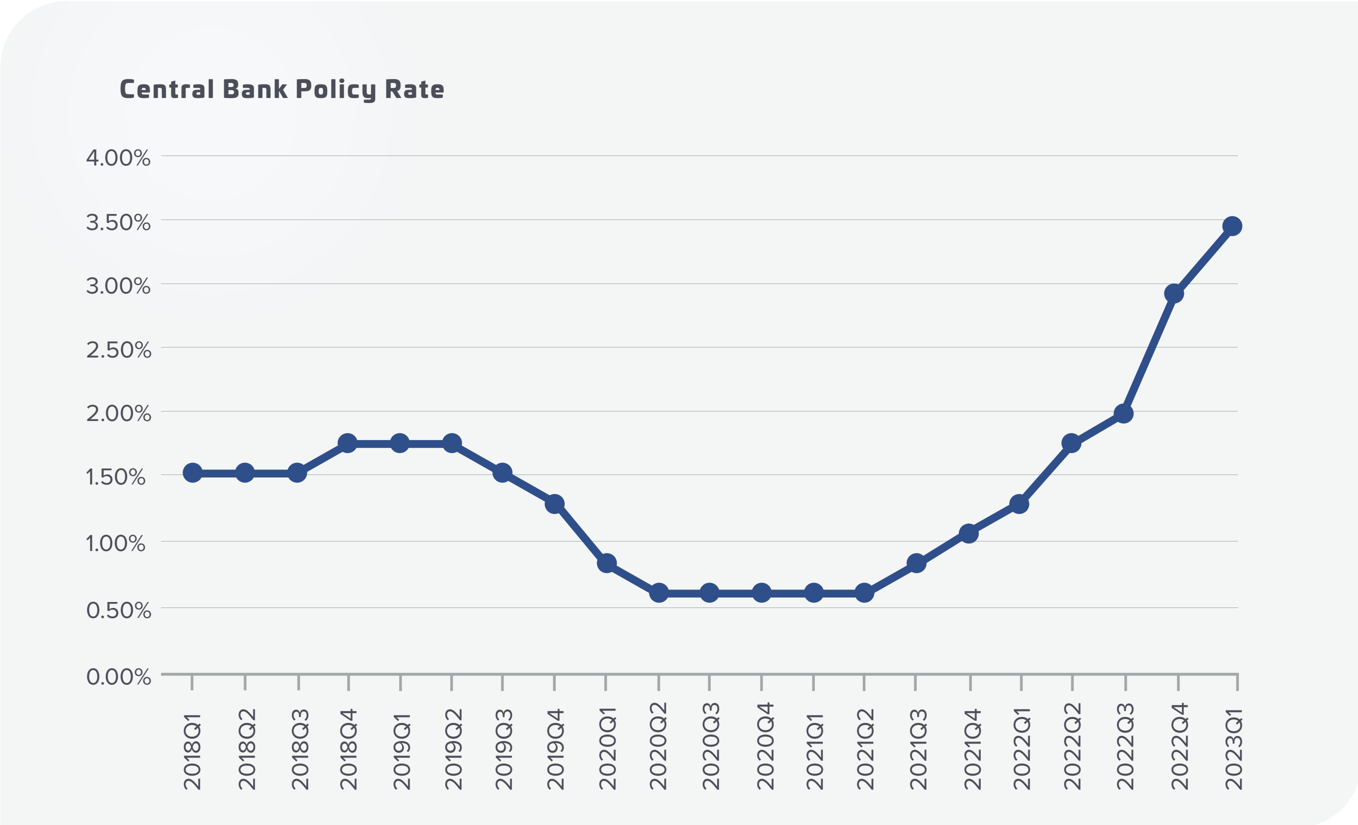
The Korean economy ended 2022 with the first contraction in gross domestic product (GDP) since mid-2020, with a 0.4% decline in the fourth quarter the confluence of multiple factors. Large manufacturers in the electronics and chemicals sectors suffered from a drop in interest from the United States, European Union, and China in the second half of the year, offsetting strong performance in the vehicle manufacturing and shipping services sectors. Global inflationary pressures continued to push a series of rate rises from the Bank of Korea, leading to more expensive debt across the macroeconomic environment, though these were paused in early 2023 pending a more tepid inflationary outlook throughout mid-to late-year. These shifts could allow for pricing on the property market to continue dissipating in coming months, with increased development and acquisition servicing costs leading to some cooling of a largely overheated market.

Increasingly indebted homeowners in Seoul have been a concern for growth prospects in recent years, with a very limited supply of new product driving up pricing for prospective acquirers. The Organization for Economic Cooperation and Development (OECD) recently lowered its annual growth forecast for Korea in their interim report to 1.6% for 2023, now agreeing with both the Bank of Korea and the Ministry of Economy and Finance and behind the expected global growth rate of 2.6%.

While glum fourth quarter statistics have led recent economic news, the largest firms continue to post excellent results and are expected to continue investing in their current and potential corporate infrastructure. Robust fiber and power across the country allows for the development of data centers and other new technologies, and continued capital expenditure to drive efficiencies is expected for each major conglomerate. Many are investing heavily in renewables, emphasizing the potential disruption of climate change to the Korean economy. This will all be necessary as demographics highlight a continued challenge in coming years, with a very low birthrate along with low immigration a growing hurdle to expansive economic growth. Continued efficiency gains will also be required for prospective trade terms, and the possibility of joining the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) could allow for deeper and lower-cost access to an array of large economies throughout Asia and Latin America.

Korea remains one of the most tech-savvy, enterprising, and sophisticated economies globally but will require further investment to weather the storms of the next decade. Outlays for environmental resilience, greater trade avenues, and deriving further efficiency from technology will pay considerable future dividends and allow Korea to continue to thrive.

Interest rates

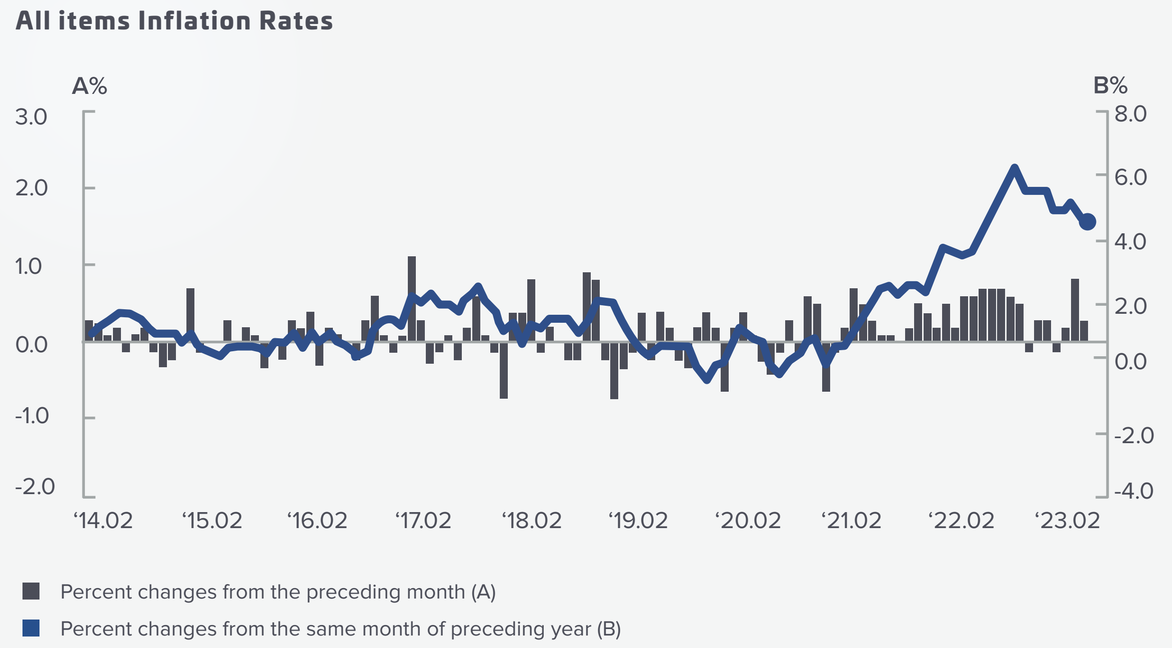


As with nearly everywhere globally, the Bank of Korea has been forced to raise interest rates on several occasions since the end of 2021 in order to tame inflation. While the most recent uptick in early 2023 shifted the benchmark interest rate to 3.5%, the Bank has elected to keep this rate over the past two months pending inflation continuing to drop toward three percent by the end of the year. With the international banking sector being watched carefully after recent concerns.

KOSPI Composite

The KOSPI composite index has experienced some volatility over the past years in response to interest rate shifts and general market concerns throughout the end of 2022. While performance as of March 2023 is a marked rise from the beginning of the year, the index overall is still 11% lower than a year earlier. While many of the largest conglomerates continue to spend on key technology investments, potential volatility in international markets could lead to further reflections locally.

Inflation Rates



Source: Ministry of Economy and Finance

All economies have suffered from inflationary pressure over the past year, though this has begun to dissipate in Korea after a considerable run-up throughout 2022. Most recently this has provided the Bank of Korea with the confidence to hold interest rates in place, potentially for some months as the economy regains more typical footing.

Company	2022 Revenue	YoY Gain/ Loss
Samsung Electronics	₩302,230,000,000,000	8%
Hyundai Motor	₩121,128,808,000,000	21%
Kia Co	₩86,560,000,000,000	24%
LG Electronics	₩83,500,000,000,000	13%
Hyundai Mobis	₩51,900,000,000,000	25%
Samsung Life Insurance	₩20,980,000,000,000	13%
Hanwha Corp	₩17,100,000,000,000	23%
SK Inc	₩9,737,799,100,000	43%
SK Hynix	₩7,670,000,000,000	38%
KB Financial Group	₩4,723,900,000,000	8%

Many of the largest Korean firms enjoyed record gains throughout 2022 despite a rough end to the year for the greater economy. These firms will continue to lead the way forward over the next several years in spurring innovation and investment across the country and beyond.