# Invest Korea

**March 2022** 

### **Ben Kang**

VP, GM & Representative Director Onsemi Korea

### Intelligent Technology for a Better Future

Business Hub of Northeast Asia Korea to Emerge as the Center of the Global Semiconductor Supply Chain Gumi National Industrial Complex, Emerging as an Innovative Cutting-edge Industrial Complex



For Excellence in Promoting Investment in Health Presented to Invest Korea Republic of Korea

### **UN Investment Promotion Awards**

**Excellence in Promoting Investment in Healthcare** 

### **Invest KOREA**

Korea is well-equipped with its robust healthcare business ecosystem, led by anchor enterprises such as Samsung Biologics and Celltrion. Thanks to the government's untiring efforts to promote the healthcare industries, Korea has seen a steady inflow of foreign direct investment.

Despite the prolonged pandemic, Invest KOREA has put in our utmost efforts to attract investment in the healthcare sector for the sustainable development of Korea. With this award, Invest KOREA will strive to contribute to sustainable development not only for Korea but also around the world.

### Semiconductor

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#### **US Novelis to** build USD 53 mn aluminum recycle center in Korea

**Seoul City** 

investment

promotion

agency for

**FDI** expansion

launches

Novelis Inc., the world's top aluminum recycler, is set to invest USD 53 million in another recycling and casting center in S. Korea to meet the growing global demand for sustainable products of the metal by expanding low-carbon production.

Novelis said on Feb. 21 that it plans to start in October construction of the center at its aluminum joint venture with Japanese steelmaker Kobe Steel Ltd., in Ulsan, a coastal city about 310 kilometers southeast of Seoul.

The facility, which is expected to begin

operations in 2024, is slated to raise Novelis' total recycling capacity in the country to more than 24 billion aluminum cans a year, reducing the company's carbon emission by more than 420,000 tons annually.

"The establishment of the Ulsan Aluminum Recycling Center is an important investment to help us achieve our ambition of becoming the world's leading provider of sustainable, low-carbon aluminum solutions," said Novelis Asia President Sachin Satpute in a statement.

The city of Seoul launched Invest Seoul on

Feb. 7, an investment promotion agency (IPA) to attract foreign investment and overseas companies. The capital of S. Korea aims to increase yearly foreign direct investment (FDI) from the current USD 17.9 to USD 30 billion by 2030.

Invest Seoul focuses on four areas: market research for FDI in Seoul; global companies' attraction; promotion of investment; and setting the global companies' Seoul offices. This is a core project of the city development plan Seoul Vision 2030, suggested by the mayor of Seoul Oh Se-hoon. Oh has highlighted the project for intensifying the capital's global competitiveness, the city government stated.

The city of Seoul will launch the new agency by upgrading Invest Seoul Center, the foreign investment promotion center in the city's global startup accelerator Seoul Business Agency (SBA). The capital has recently increased the agency's staffing from 15 to 22. In 2024, Invest Seoul will be separated from SBA to expand its FDI attraction in earnest.

#### S. Koreans spend record high on **Netflix in Jan.:** data

S. Koreans spent a record high on Netflix in January, data showed on Feb. 10, highlighting the video streaming giant's popularity in the country despite a recent hike in subscription fees.

Local credit and debit card payments on the video streaming platform reached KRW 82.6 billion (USD 69 million) in January, the highest-ever monthly figure, compared with KRW 74.5 billion the previous month, according to the data from industry tracker WiseApp.

WiseApp said an estimated 5.28 million S. Koreans made payments to Netflix last month, up 10.7 percent from December.

WiseApp said the 30s age group accounted for the largest share of paid users at 29 percent, followed by those in their 20s at 27 percent.

#### Trade & Commerce

#### S. Korea eyes active push for FTAs with African nations

S. Korea said on Feb. 16 it will actively push for free trade agreements with African nations in a move to deepen economic ties with the resource-rich emerging market and to diversify its trade portfolio.

In January, S. Korea and Egypt agreed to carry out a joint feasibility study on the bilateral trade and economic partnership, which is a first step for S. Korea to have a free trade pact with an African country if the two sign the free trade deal.

Trade volume between S. Korea and African countries came to around USD 20 billion as of 2018, accounting for a mere 2 percent of Seoul's yearly total, government data showed.

"The government is working to push for clinching FTAs with African countries, which have a great growth potential, to expand our export destinations and to ensure stable supply chains of key minerals," senior trade official Chun Yoon-Jong said during a meeting with experts.

The experts called on the government to double up such efforts, as intra-African trade is expected to be accelerated further after the African Continental Free Trade Area (AfCFTA) came into force in January last year.

The pact was signed by 54 out of 55 African Union nations, according to the industry ministry.

#### S. Korea ranks 10th in number of unicorns with fresh high of 18 in 2021

S. Korea is one of the top 10 countries in the world with the most unicorn startups worth more than USD 1 billion after reporting an alltime high of 18 in 2021 partly thanks to massive investments by venture capitalists in promising startups amid ample liquidity.

According to data from the Ministry of SMEs and Startups on Feb. 15, Korea had 18 unicorn businesses as of the end of December 2021 versus 13 in 2020. The figure represents 11 unicorns compiled by startup information agency CB Insights and seven identified by the SME ministry's own analysis of investment industry and media sources.

Fintech and crypto exchange firms such as Dunamu and Bithumb Korea, and online e-com-

#### Korea adds 100,000 EVs last year with cumulative green cars topping 1 mn

S. Korea joined a select group of nations with newly registered EV cars at more than 100,000 units last year.

According to the Ministry of Land, Infrastructure and Transport on Feb. 2, cumulative sales of eco-friendly vehicles in Korea reached 1,159,087 units as of the end of last year, gaining 41.3 percent from a year ago and taking up 4.7 percent of vehicles on Korean roads. This is the first time the number of registered green cars has exceeded 1 million units, and the share has been on a rise from 0.7 percent in 2014 to 3.4 percent in 2020. merce platforms Market Kurly and Danggeun Market newly joined the unicorn club last year. Zigbang, Bucketplace and Ridi also drew attention for their fast growth among new members. But e-commerce giant Coupang and game developer Krafton were excluded from the list last year after they went public.

Sustaincoble Growth

with Innovative Korea

The number of Korean unicorns has continued to grow, reaching 10 in 2019, 13 in 2020 and 18 last year. There were only three in 2017. As a result, S. Korea now ranks 10th in the world in terms of unicorn business numbers, following the United States, China, India, Britain, Germany, Israel and France, according to CB Insights data.

Cumulative sales of electric vehicles totaled 231,443 units, up 96,481 units from the previous year. Hybrid sales added 34.7 percent to 908,000 units, and hydrogen cars up 77.9 percent to 19,000 units, while sales of diesel-fueled cars fell to 9,870,000 units. Gasoline-fueled cars have been sold a total of 11,759,000 units, up 3.1 percent on year.

Electric vehicle sales jumped 115 percent to 100,000 units. The U.S., China, Germany, France and the U.K achieved the 100,000 units EV sales milestone in 2020. Korea and Norway joined in 2021.

#### **Government & Policy**

Seoul to stop subsidies for gas vehicles from 2024 and hybrid cars from 2025 or 2026 S. Korea will only subsidize purchase of all-electric and fuel cell vehicles from 2025 or 2026 by ending incentives for gas-fueled and hybrid cars.

Hong Nam-ki, deputy prime minister and finance minister said on Feb. 24 that the government is considering excluding liquefied petroleum gas (LPG) and compressed natural gas (CNG) vehicles from low-emission vehicle category from 2024 and also hybrid vehicles from 2025 or 2026.

"The government, however, will continue its support on component manufacturers of hybrid vehicles considering greenhouse gas reduction effect and cost competitiveness," Hong said.

His remarks were made at a meeting on innovative growth of big 3 industries—system semiconductors, future vehicles, and bio health—at Seoul government complex.

Currently, electric, hydrogen, hybrid, and environmentally-friendly internal combustion cars fall under low-emission vehicle category. In two to three years, however, the government plans to only pure battery and fuel cell vehicles in the group.

The government is also mulling extending tax relief on hybrid, electric, and hydrogen vehicles for another three years until the end of 2025. The relief was to end by this year.

An individual that buys hybrid cars can save KRW 1 million (USD 834.8) cut in individual consumption tax, electric cars KRW 3 million, and hydrogen cars KRW 4 million.

# Business Hub of Northeast Asia

In 2021, Korea's annual exports reached an all-time high of USD 644.4 billion. Analysts say that Korea has responded timely to the expansion of global demand for Korea's major industries such as semiconductors and petrochemicals.

In addition, Korea's open business environment is the other factor of the all-time high exports. Korea's excellent logistics infrastructure and wide FTA network led Korean companies to have smooth exchanges with global companies despite the COVID-19 situation.

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\* Sources: Statistics Korea, Ministry of Trade, Industry and Energy, Moody's

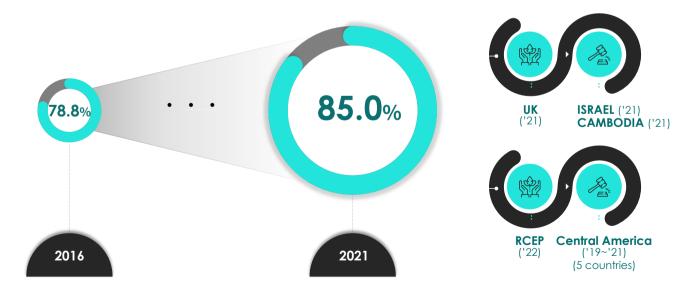




Korea is the 7th largest exporter in the world (Oct. 2021, IMF). Exports from Korea are led by the manufacturing industry, and major items of export include semiconductors, automobiles, automobile parts, oil products, and displays. In 2021, Korea's exports reached USD 644.4 billion, far exceeding the previous high (USD 604.9 billion in 2018).

Exports of 15 major items, including semiconductors, petrochemicals, and automobiles, all increased by more than 10 percent, while exports to nine major regions, including China, ASEAN, the United States, and the EU, all increased.

#### **Global Trade Hub**



Korea's FTA network covers 85% of global GDP

Korea has signed 21 agreements, covering 58 countries (as of Dec. 2021) which include major economies like the EU, the US, and China, while continuing to pursue FTAs with emerging countries.

With its geographical advantage, Korea is a gateway to the global markets that links most of the largest economies. As of December 2021, Korea's FTA network covers 85 percent of global GDP.

#### The Center of East Asia, Logistics Hub

**Incheon Intl. Airport** 

F

3rd

6th

International Air Cargo Traffic (2020) \*Source: Airports Council International (ACI) (2021)

Incheon Intl. Airport International & Domestic Air Cargo Traffic (2020) \*Source: Airports Council International (ACI) (2021) Busan Port Transshipment Cargo Volume (2020) \*Source: Busan Port Authority (2021)

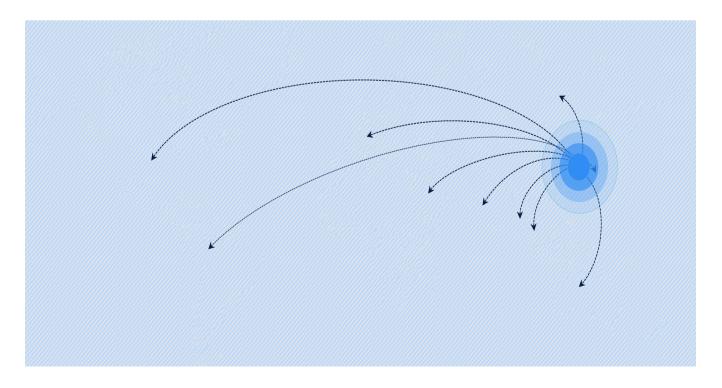
7th

2nd

#### **Busan Port**

Container Throughput (2020) \*Source: Busan Port Authority (2021)

Other than the vast FTA networks, Korea also has one of the best logistics infrastructures in the world. Korea possesses optimal logistics infrastructure connecting it with major countries and cities around the world. Located between China and Japan, Korea is the center of aviation and maritime logistics, connecting the Asia-Pacific region as well as Eurasia and the Americas. Furthermore, Korea has the potential to establish a land-based route penetrating the Eurasian continent.

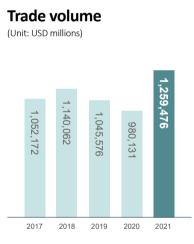


# **Economic Indicators**

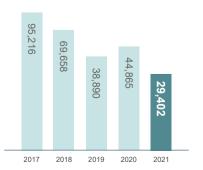
Here's a look at Korea's major economic indicators that provide an overview of the country's recent economic developments.

#### Source:

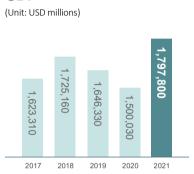
International Monetary Fund (IMF), Bank of Korea (BOK), Korea International Trade Association (KITA), Ministry of Trade, Industry and Energy (MOTIE)



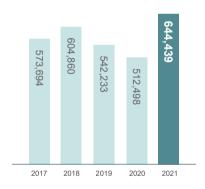
**Trade balance** (Unit: USD millions)



#### GDP



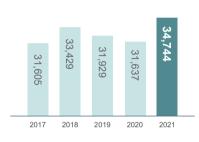
Exports (Unit: USD millions)



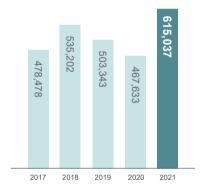
FDI (Unit: USD millions)



Per capita GDP (Unit: USD)

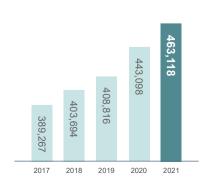


Imports (Unit: USD millions)



### **Foreign exchange reserves**

(Unit: USD millions)

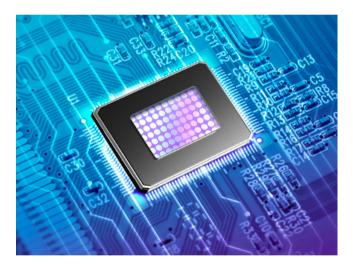


# One-on-One with Ben Kang

VP, GM & Representative Director of Onsemi-Korea

# Intelligent Technology for a Better Future

Invest Korea talks to Ben Kang, VP, GM & Representative Director of Onsemi Korea, to hear more about the company's operations in Korea and his experience doing business here.



eadquartered in Phoenix, Arizona in the United States, Onsemi is a leading manufacturing company which offers a portfolio of sensors, power management, connectivity, custom and system on chip (SoC), analog, logic, timing, and discrete devices.

Invest Korea interviews Ben Kang, VP, GM & Representative Director of Onsemi Korea, to hear more about the company's operations in Korea and his experience doing business here.

#### Please tell us a little bit about yourself.

I've worked for various companies throughout my 35-year career, and they were all integrated device manufacturers (IDMs), starting from the semiconductor division of Hyundai Electronics, which is currently SK Hynix. Having finished my career at Hynix as the head of its Wuxi Fab in China, I took on a new challenge and joined Fairchild Korea Semiconductor as the representative director in 2010. Since Onsemi's acquisition of global Fairchild in 2016, I have served as the representative director of Onsemi Korea.

I believe I was able to build my career with companies at home and abroad over a long time, thanks to the Korean semiconductor industry's outstanding manufacturing technology, which enables the country to produce excellent products. I hope I can continue to contribute to further developing Korea's technology and competitive edge in semiconductor production.

#### Why did Onsemi establish a branch in Korea?

Before it acquired Fairchild in 2016, Onsemi was a leading manufacturer of low-voltage products while lagging behind in the high-voltage category. When it acquired three fabs of Fairchild, the Korean fab was highly valued as it was the only one capable of producing high-voltage products. Afterwards, Onsemi was able to complete the product portfolio ranging from low-voltage to high-voltage, all thanks to the Korean fab. The Fab Owners Association evaluated each of Onsemi's fabs after the acquisition, and the results found that the Korean fab not only excelled in manufacturing unit cost, a key indicator of competitiveness, but it emerged as the role model of other fabs as it also performed exceptionally in most areas including product export (more than 99%), parts replacement costs, and availability.

These results led to Onsemi's headquarters' strong interest and investment, and the company is currently investing in the production of silicon carbide (SiC) products, which are expected to grow as Onsemi's main product. While it is very tricky to manufacture SiC products due to the multiple defects inherent in the raw material itself, the Korean fab tackled all the difficulties and successfully produced the initial version of SiC in 2014, followed by the successful launch of diodes in 2015 and MOSFET in 2018. The prowess and commitment of the Korean fab enabled Onsemi's headquarters to maintain its business in Korea and make additional investments.

#### What are the advantages of doing business in Korea?

One advantage comes from the highly skilled and educated workers in the Korean semiconductor industry. Recent statistics show that the Korean semiconductor industry has more than 1,100 companies and employs around 170,000 workers. Since around 60 percent of them are working in the device field, there is the advantage of being able to tap into a rich pool of workers with different



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The Korean semiconductor industry has more than 1,100 companies and employs around 170,000 workers. Since around 60 percent of them are working in the device field, there is the advantage of being able to tap into a rich pool of workers with different work experience.

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work experience. Korea also values education and annually produces about 20,000 new entry-level workers majoring in electronics, electric or materials. As semiconductor is a very popular sector among students, businesses can recruit exceptional talent.

Moreover, Onsemi is a producer of non-memory semiconductors, but if we look at Korea's memory semiconductor sector, the country's technological edge in the manufacturing process backed by its top-class competitiveness guarantees effective investment and price competitiveness. Korea's world-class 5G communication infrastructure and highly-advanced smartphones, cars and other industries also allow businesses to develop semiconductor technology and find a customer base.

I believe the semiconductor industry will benefit from the Korean government's strong will to support the industry and the recent introduction of the K-semiconductor Strategy, offering tax benefits, financial grants and regulation exemptions on the national level.

#### What are some characteristics of Korea's semiconductor/ manufacturing industry, and what kinds of strategies did Onsemi utilize to target the Korean market?

Not only does Korea have excellent human resources and strong backbone industries needed for the semiconductor industry, it has innovative corporate culture and provides government support, enabling businesses to stay highly competitive.

Onsemi will make the most of these advantages and build a production system that meets market demand as well as producing high-quality products so as to emerge as the best and biggest power semiconductor production base not just in Korea but throughout the world.

#### What kind of opportunities does Korea's new policy schemes such as the Green New Deal, Digital New Deal or ESG offer for your company?

A company's response to environmental issues is no longer just a business item for profit-making but a matter of survival. As the Korean government's policies are wellaligned with the way Onsemi produces and manages products, I believe it will play to our great advantage when doing business in Korea. Onsemi is committed to the evolution of sustainable energy with its leading solutions including highly-efficient solar-powered LED strings, intelligent power technology for industry-grade power and

storage systems. It is also building energy infrastructure such as charging stations with our highly-efficient intelligent power solutions incorporating both IGBT and SiC.

Moreover, SiC semiconductors expected to grow as the Korean fab's key categories are customized to EVs, which means they operate more stably in high-voltage compared to silicon semiconductors while reducing power loss from the existing rate of around ten percent to around four percent. Not only do they improve EV fuel efficiency by more than ten percent, they also cut carbon dioxide emissions. The demand for SiC semiconductors is expected to grow rapidly considering the EV market's exponential growth since the introduction of more stringent ESG regulations by countries around the world in 2020, with experts predicting the market to grow by more than fivefold by 2025.

### What Korean companies/agencies do you work with to strengthen your business partnerships?

The governments of Bucheon City and Gyeonggi Province where we are located in are supporting us with cash and tax benefits and other regulatory exemptions for our investment. Government agencies, including MOTIE, are dedicated to supporting businesses, and supporting organizations (including the chamber of commerce) also spare no effort in supporting Onsemi and the semiconductor industry in general.

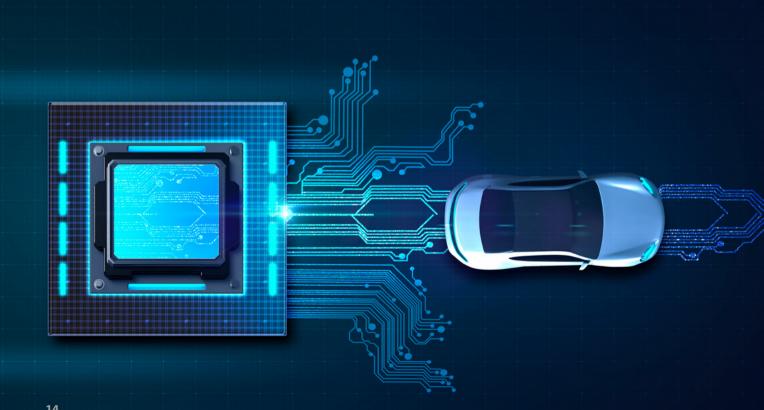
While the semiconductor industry involves building devices and requires close partnership with equipment and materials suppliers to ensure business success, Onsemi has solid partnerships with major Korean companies including SK Siltron, LS Nikko, Soulbrain, SK Materials, Wonik, and Ramtech as well as small but strong materials, parts and equipment suppliers including Join Technology. The partnerships with local companies are emerging as a key factor for business success considering the growing risks associated with procuring raw materials and equipment. Onsemi is committed to seeking active exchanges with Korean companies for our stable operation and ultimately for the semiconductor industry to rise as the nation's key industry.

#### What are Onsemi's future goals for Korea and Asia as a whole?

Onsemi plans to go carbon-neutral by 2040, and our business is focused on increasing production capacity for SiC semiconductors, image sensors and other key components of EVs and self-driving cars. This is wellaligned with Korea's diverse industrial policies that I have already mentioned, and the Korean fab's vision is to supply key components of future industries both locally and internationally by focusing on SiC semiconductors and highly-efficient power semiconductors.

More specifically, the Korean fab is expected to emerge as the world's biggest SiC production base within a few years by making continuous investments needed to expand the production facilities for SiC products, expanding the product portfolio, improving the fab yield and upgrading our production equipment.

> **By Grace Park** Executive Consultant Investment Public Relations Team Korea Trade-Investment Promotion Agency (KOTRA)



## V-memory, Next-generation Memory that is a Million Times Faster

#### About the Company

V-memory Corp. has developed next-generation semiconductor memory technology compatible with 6G and 7G.

Produced with new materials and device structure, V-memory's products provide a speed that is a million times faster than existing flash memory, semi-permanent read-write lifespan and data retention, and low-power operation to lead the future of the semiconductor industry.

#### Background

The semiconductor industry is overcoming technological limitations by developing smaller and faster devices through constant innovation.

Given the limitations of existing flash memory devices—a speed of 1ms, read-write operations limited to 100,000 times and a data retention lifespan of five years—the world needs next-generation devices catering to the future society driven by AI and big data.

V-memory Corp. has verified its ability to provide viable next-generation semiconductor memory that can overcome these limitations.

#### About the Product and/or Technology

V-memory can reduce the production cost by dramatically simplifying the existing flash memory production process. Its semiconductor memory stores data by applying threshold gate voltage on a domain called VL.

The mechanism provides a speed that is a million times faster than existing devices, semi-permanent read-write lifespan, and low-power operation.

#### Competitive Edge and Business strategy

V-memory aims to contribute to the next-generation memory industry with the world-class competitiveness of its semiconductor memory.

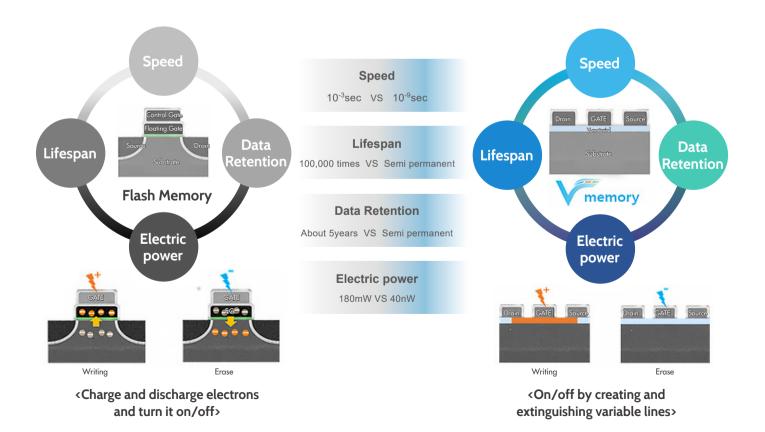
Based on V-memory's technology, more than 60 patents have been registered and applied in the US, China, Japan, Europe, and PCT as well as in South Korea. V-memory successfully attracted an investment of USD 20 million to produce not just unit devices but wafer-scale memory devices, and it is working towards building devices that can replace DRAM and flash memory.

V-memory plans to manufacture GPU and CPU-grade devices by attracting an additional investment of USD 100 million and to transfer and license its technologies and patents to memory manufacturers.

#### **Future Plans**

V-memory plans to register and apply for more than 555 patents by further strengthening its main patents.

V-memory aims to attract an investment of USD 100 million and win a market worth more than USD 40 billion in 10 years by strengthening its business based on the technological edge and key patents.



#### V-memory's estimated operating profit

	Early	Middle-term 6G Service	Long-term
TIME LINE	Start ~ +3Y	+4Y ~ +7Y	+8Y ~ +10Y
V-memory Marketshare (USD billions)	~ 8.6 (USD billions)	~ 146 (USD billions)	~ 400 (USD billions)
Technology Fee (USD billions)	0.86	10.2	20
V-memory CHIP share (USD billions)	0.27	75.1	285.5
Total sales (USD billions)	1.1	85.4	305.5
R&D investment Cost (USD billions)	0.17	12.8	45.8
Operating Income fee (USD billions)	0.79	38.2	130.2
Corporate value (PER9.0)	5.4	258.1	878.8

\* The opinions expressed in this article are the author's own and do not reflect the views of KOTRA.

By Jong-Soo Rhyee (Professor, Ph.D) CEO V-memory Corp. vmemory.net



## Korea to Emerge as the Center of the Global Semiconductor Supply Chain

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n January 2022, Gartner announced that the market size of the global semiconductor market in 2021 surpassed USD 500 billion for the first time, recording USD 583.5 billion, up 25.1 percent from the prior year. In particular, the growth rates of major global memory-semiconductor manufacturers were especially higher—Samsung Electronics 31.6%, SK Hynix 40.5%, and Micron 29.1%—than that of the overall global semiconductor market. The forecast by Morgan Stanley, published in its report "Memory, winter is coming" in August last year, that the semiconductor market will suffer overall depression due to over-supply caused by sluggish demand for memory semiconductor and that falling chip prices appeared to be way off the mark.

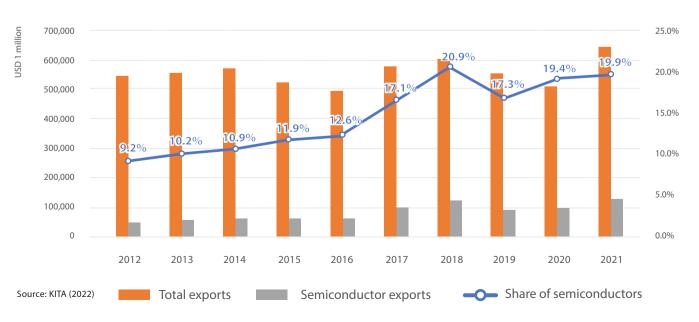
#### Korea's Semiconductor Industry with Growing Internal & External Significance

The semiconductor began to stand out as Korea's No.1 export item in 2010, when it first outperformed shipbuilding and petrochemical products. Since 2013, it has maintained No.1 position and has driven Korea's ex-

ports, accounting for 20 percent share of all exports every year after first exceeding 17.1 percent in 2017. Also, its market share in the global semiconductor market surpassed that of Japan in 2013, clinching the No.2 position, and this has been maintained since then. In particular, Korea's market share in the global memory semiconductor market is especially high at 60 percent. Korea's semiconductor industry has grown to become a driver of Korea's exports internally, and a player with great influence on the global market externally.

#### Global Semiconductor Market Riding on Growth Momentum

In 1980 when semiconductors began to be deployed, the scale of the global semiconductor market was small, valued at USD 10.6 billion. In 15 years, it crossed the USD 100 billion threshold in 1995, reaching USD 134.7 billion. After 10 years, it exceeded the USD 200 billion mark in 2005, growing to a USD 208.4 billion market. Due to the global economic crisis afterwards, the growth momentum of the global semiconductor market also slo-



#### Share of Semiconductors in Korea's Exports

#### 60% 53.3% 52.6% 52.0% 51.7% 50.8% 50.6% 49.8% 0 48:6% 50% 0 40% 30% 23:6% 21.4% 18.4% 18.4% 17.0% 16.5% 20% 16.2% 15 5% 10% 0 0% 2013 2014 2015 2016 2017 2018 2019 2020 Source: OMDIA (2021), etc. US Korea Taiwan China Japan Europe

#### Global Semiconductor Market Share by Country

wed down. But it began to recover in 2015, and reached USD 421.7 billion in 2018, crossing the USD 400 billion threshold. Continuing this accelerated growth, the market scale exceeded USD 500 billion in 2021. So, the period it takes for the market to grow by USD 100 billion seems to be getting shorter. With the semiconductor market projected to grow at around 10 percent this year, this period is going to be just one year. Looking around, it is getting harder to find the electronics devices without semiconductors, while products with various functions are continuing to be developed. In addition, the demand for memory semiconductors for servers is growing explosively driven by the progress of platform services. Machines are already creating, processing, and storing data by themselves, even faster than humans. Thus, demand for semiconductors is expected to grow further, accelerating the growth of the global semiconductor market.

### Establishing a Global Top Supply Chain by Strengthening Ecosystem

Korea's semiconductor industry has focused on

fostering memory semiconductor based on a strategy of choice and focus. As a result, Korea's memory semiconductor has gained significant competitiveness, while system semiconductors have been left behind. Memory semiconductors and system semiconductors differ in terms of market and characteristics. Thus, the need to secure competitiveness in system semiconductors has been continuously voiced to become a semiconductor powerhouse. The Korean government unveiled the 'System Semiconductor Vision and Strategy (April 2019)' and the 'K-Semiconductor Strategy (May 2021)' to emerge as the comprehensive semiconductor powerhouse, moving beyond improving the system semiconductor sector. What the two policies have in common are: strengthening the competitiveness of memory semiconductors and system semiconductors domestically and expanding domestic production by shoring up the ecosystem of Korea's semiconductor industry. It was clearly a faster move than Japan and European countries who began to voice the need to grow the semiconductor manufacturing industry domestically only after the shortage of semiconductors for vehicles, started at the end of 2020, became serious.

The 'System Semiconductor Vision and Strategy' is a policy initiated to strengthen ecosystem of the domestic semiconductor industry based on recognition that Korea's semiconductors have weakness in system semiconductors due to its focus on memory semiconductors in the past. Ultimately, the policy aims to facilitate realization of the comprehensive semiconductor powerhouse by advancing the competitiveness of system semiconductors, building on the improved ecosystem of semiconductor industry. This also relates to establishment of supply chain, which is emphasized by the K-Semiconductor strategy. If these policies produce results, the Korean semiconductor industry will be able to produce semiconductors without being impacted by external environmental changes, becoming a center of stable supply chain in the global semiconductor market.

> **By Yang-Paeng KIM** Korea Institute for Industrial Economics & Trade ypkim@kiet.re.kr

\* The opinions expressed in this article are the author's own and do not reflect the views of KOTRA.

#### System Semiconductor Vision and Strategy

Vision	Emerge as the comprehensive semiconductor powerhouse, moving beyond a memory semiconductor powerhouse
Strategy	<ul> <li>[Fabless] Create the ecosystem for growth with a long-term perspective, encompassing demand, fund, manpower, technology</li> <li>[Foundry] Emerge as the global leader in a short space of time based on the competitiveness of memory semiconductors</li> </ul>

Source: Ministries concerned jointly (2019)

#### **K-Semiconductor Strategy**

Vision	Establish the global top semiconductor supply chain in 2030
Strategy	[Strategy 1] Stabilization of semiconductor supply chain → Create K-semiconductor belt [Strategy 2] Emerge as the center of semiconductor manufacturing → Expand infrastructure support
	[Strategy 3] Secure manpower, market, and technology $\rightarrow$ Shore up growth foundation of semiconductor [Strategy 4] Protect the domestic industrial ecosystem $\rightarrow$ Improve crisis response of the semiconductor sector

Source: Ministries concerned jointly (2021)

### Gumi National Industrial Complex Emerging as an Innovative Cutting-edge Industrial Complex

As the nation's biggest inland industrial complex, the five complexes of the Gumi National Industrial Complex is leading the growth of future industries including electronics, semiconductors, IT and new materials.

In particular, Korea's major semiconductor leaders and businesses in the secondary cell materials and equipment industries are investing in the Complex, triggered by the emergence of the stable supply of semiconductors as a major issue.

Having acquired Dupont's SiC wafer business, SK Siltron plans to establish a SiC wafer manufacturing line in the Gumi 2 Plant by investing KRW 190 billion by 2024, in line with the company SK Siltron ambition of rising as the world's second largest supplier of SiS wafers. As the first non-memory semiconductor manufacturer that started operating in the Gumi National Industrial Complex in 1969, KEC also plans to invest KRW 20 billion to upgrade its manufacturing facilities, thereby contributing to the stable supply of semiconductors.

The Gumi National Industrial Complex through constant investment is expected to serve a leading role as a major semiconductor base. The effort will also ensure Gumi's growth as the center of the K-semiconductor industry and innovative cutting-edge industries.

Sustaincoble Growth

with Innovative Korea

#### About the Industrial Complex

#### Overview

- Name: Gumi National Industrial Complex
- \* Location: Around Gongdan-dong, Simi-dong, and Sandong-eup of Chilgok-gun, Gumi, Gyeongsangbuk-do
- Area: 36,066,000 m<sup>2</sup>
- Facilities

-	raciitties					(Unit:1,000 m²)
	Total area	Industrial facilities	Multi-purpsoe facilities	Residential facilities	Supporting facilities	Public facilities
	36,066	20,734	101	12,327	2,593	10,311

\* Contact: Gyeongbuk Regional Division of the Human Resources Development Service of Korea

#### About the Location

#### Road

- Expressway: Gumi IC and South Gumi IC of Gyeongbu Expressway (257 km from Seoul, 180 km from Busan, and 33 km from Daegu)
- National highway: No. 5 (Masan ↔ Gumi ↔ Junggangjin), No. 25 (Jinhae ↔ Gumi ↔ Cheongju), No. 33 (Goseong ↔ Gumi)
- Local highway: No. 33 (Gumi ↔ Pyeongchang), No. 68 (Seocheon ↔ Gumi ↔ Gyeongju)

#### Railway

- Gumi Station, Gyeongbu Line (3.5 km), KTX Gimcheon Gumi Station (18 km, transfer to West Daegu Station or Daegu Station)
- 227 km from Seoul (3 hr 10 min), 167 km from Busan (2 hrs.), 46.4 km from Daegu (30 min.)

#### Airport

- Close to Daegu Airport (40 km)



#### Port

- Busan Port (150 km) : Simultaneously accommodates 201 ships and has a cargo unloading capacity of 91 million tons/yr.
- Pohang Port (old/new) (130 km) : Simultaneously accommodates 46 ships and has a cargo unloading capacity of 53.41 million tons/yr.

#### Key Highlights

- Selection of the Gumi Industrial Complex as a smart complex (2019)
  - Carried out by the Gumi National Industrial Complex, the Ministry of Trade, Industry and Energy, and the Human Resources Development Service of Korea

- Total budget of KRW 446.1 billion invested from 2020 to 2023

- A future-oriented industrial complex combining ICT will be established to make the nation's materials and parts industries more competitive.

• Selected in the project of upgrading the industrial complexes of the Gyeongbuk region (2020)

- The program will be implemented by designating Gumi Complex as the hub linked to general complexes in Gimcheon, Chilgok and Seongju.

- KRW 990 billion to be invested in 34 projects for three years from 2021 to 2023.

- A ICT-combined materials and parts cluster tailored

to Gyeongbuk will be established for the revitalization of the electronics industry and for the growth of the future car industry.

- SK Siloton invests KRW 190 billion for the establishment of a semiconductor manufacturing facility.
  - Sic wafer production facility
  - 100 workers employed
  - MOU signed on November 16, 2021
- Semiconductor supplier KEC invests KRW 20 billion for the upgrade of its semiconductor production line
   MOU signed on November 15, 2021
- Jahwa Electronics invests KRW 192.3 billion for the production of mobile camera parts
  - Production of optical image stabilizers
  - 604 workers employed
  - MOU singed on December 23, 2021

Source: Gyeongbuk Regional Division of the Human Resources Development Service of Korea and Gumi City



# **Invest KOREA Market Place**

Invest Korea Market Place (IKMP) is an online business matching platform available on Invest KOREA's website with information on approximately 300 Korean companies seeking to partner with foreign investors. This month, Invest Korea introduces some outstanding companies in Korea's semiconductor industry.

	Inv	vestment Requirement		Company Profile
	Amount	USD 8 million	Patents and Certificates	15 patents, applied for 3 patents
AEGIS Series, based on the	Investment Structure	Minority (Financial Investment)	Financial Performance	(Sales in 2021) USD 34.24 million
company's	Investment	Highlights	·	

#### **Investment Highlights**

- · Development and manufacture of patterned semiconductor wafer defect inspection tools: The company specializes in the development and manufacturing of patterned semiconductor wafer defect inspection equipment. It first succeeded in localization in Korea in 2014 and was acknowledged for its technical power through joint development with Germany's Fraunhofer IPMS-CNT, the world's top semiconductor device manufacturing technology powerhouse.
- · Advancing into the global market: According to Semiconductor Equipment and Materials International (SEMI), the total size of the front-end-of-line patterned wafer micro defect inspection equipment market is estimated to reach USD 3.6 billion (KRW 4 trillion) in 2019. This market is expected to annually grow by about 6.4%, and its value will reach about USD 4.5 billion (KRW 5 trillion) by 2023. At present, the US company, KLA Corporation, takes up at least a 90% market share of the front-end-of-line patterned wafer defect inspection equipment market.

	Digital far-in- frared	A
V	thermopile sensor	Inv St
	Dual-channel NDIR CO2 sensor	lı •
	SWIR Under Display Proximity Sensor	•

(Located on the rear of a mobile

device)

COMPAN

innovative 2D

imaging

Twins

module

COMPAN B

integration

technology

Inv	estment Requirement		Company Profile
Amount	USD 5 million	Patents and Certificates	Registered 24 patents and applied for 8 patents in S. Korea, 2 utility model rights in China
nvestment Structure	Minority (Financial Investment or Strategic Investors) or Joint Venture	Financial Performance	(Sales in 2021) USD 82.26 million

#### Investment Highlights

- A specialized infrared, gas, and proximity sensor manufacturer: As a fab-based device manufacturer equipped with its own MEMS fab, the company has developed the world's first compound thin film-based infrared sensor called "micro-thermopile," which overcomes the limits of the existing silicon thermopile. Moreover, it has developed an NDIR gas sensor, which is essential to home appliances such as air conditioners, and a proximity sensor, which is indispensable to smartphones. Agreements on the delivery of both products are on the table with major Korean and Chinese manufacturers.
- Marketing network: The CEO of the company served as a director of a specialized image sensor company, where he sold over 1 billion CMOS image sensors. Thanks to this reputation, he has secured marketing channels in different countries including S. Korea, China, and Taiwan. The company's key products include temperature sensors, gas sensors, and proximity sensors, which are available through established marketing networks.

# The Korean Green Taxonomy (K-Taxonomy) Guideline and Its Implications

The Ministry of Environment of Korea established a national green taxonomy (the "K-Taxonomy") based on the Environmental Technology and Industry Support Act, which was recently amended on April 21, 2021. On December 30, 2021, the Ministry of Environment announced the "K-Taxonomy Guideline" (the "Guideline"). Although the Guideline is not legally binding, it provides principles and standards on what types of economic activities are considered green activities. The Guideline serves to assist in allowing more funds to be allocated to green projects and green technologies as well as in distinguishing truly green activities from merely greenwashing activities.

### <The Guideline>

#### 1. Principles of the K-Taxonomy

K-Taxonomy refers to the classification of green economic activities contributing to six environmental goals: greenhouse gas reduction, adaptation to climate change, sustainable water conservation, recycling, pollution prevention and management and biodiversity.

Proper green economic activities must (i) contribute to the achievement of one or more of the six environmental goals above, (ii) not cause any serious damage to other environmental goals in the process of achieving the set environmental goal and (iii) not violate the laws and regulations related to human rights, labor, safety, anti-corruption and destruction of cultural properties.

#### 2. K-Taxonomy and Economic Activities

According to the Guideline, green economic activities consist of (i) the "green sector", referring to the truly green economic activities essential for carbon neutrality and environmental improvement and (ii) the "transition sector", activities temporarily included in K-Taxonomy as an intermediary step towards carbon neutrality.

The "green sector" is further classified into greenhouse gas reduction, adaption to climate change, water, circular economy (i.e., recycling and using methane gas), pollution prevention and treatment and biodiversity. The "green sector" consist of 64 green economic activities in total, among which are activities related to industry, power generation and energy and transportation.

The "transition sector" is classified into five economic activities: (i) greenhouse gas reduction activities at SMEs, (ii) energy production based on liquefied natural gas and mixed gas (i.e., the gas that is a mixture of two or more biogas including hydrogen, ammonia, by-product gas and liquefied natural gas), (iii) liquefied natural gas-based hydrogen (blue hydrogen) production, (iv) eco-friendly shipbuilding and (v) eco-friendly ship transportation. Economic activities falling under the "transition sector" include some fossil fuels, but only temporarily until 2030. For liquefied natural gas and mixed gas-based energy production, the extension of its accreditation period up to 2035 is to be determined. The Ministry of Environment has announced that it plans to fortify the level of greenhouse gas reduction in consideration of technology development trends even for economic activities falling under the "transition sector."

#### 3. K-Taxonomy Conformity Process and Use of the Guideline

To utilize green finance such as green bonds, green loans and green funds, corporations and financial institutions must first confirm whether their economic activities meet the K-Taxonomy requirements. According to the Guideline, if a corporation or a financial institution's economic activity meets all four standards (activity, accreditation, exclusion and protection), such activity will be deemed to meet the K-Taxonomy requirements.

In determining whether their economic activities meet the K-Taxonomy requirements or making investmentrelated decisions, corporations and financial institutions may refer to the Guideline for definition and standards for green economic activities. Accordingly, it has become easier for corporations and financial institutions to determine whether their assets, projects or activities are suitable for K-Taxonomy and disclose such results to the public.

#### <Implications>

The Guideline, along with the "Korean Green Bond Guideline" published in December 2020 by the Ministry of Environment and the Financial Services Commission, provides market participants with a clearer standard on what types of economic activities are true green economic activities. In particular, the Guideline stipulates the different standards (i.e., activity, accreditation, exclusion and protection) in great detail and serves as a very helpful tool for market participants in each industry in applying K-Taxonomy to their activities.

The Ministry of Environment has suggested that the Guideline will be further revised and supplemented after piloting it for a year and that the Ministry will consider market trends such as the EU Taxonomy in making the revisions and supplementations.



By Soo Young Song Partner ESG Team SHIN & KIM LLC sysong@shinkim.com

## Korea 101: Banking

#### (1) Hours

09:00-16:00 (closed on weekends and public holidays)

#### (2) Opening an Account and Bankbook

- Application: Apply at a branch

- Necessary documents: (Resident) passport, alien registration card, personal seal (signature); (Nonresident) passport, driver's license, credit card, personal seal (signature)

\* Check with your bank in advance since different banks and accounts may require different documents.

- Note: If you have to use a passport or a travel certificate, you have to present your address in Korea and contact information along with some additional documents such as your domestic ID card, a credit card you use in Korea or a certificate of tax payment.

\* To apply for an ATM card, you should have a job in Korea or have a Korean guarantee your identity.

#### (3) Automatic Teller Machine (ATM)

- Most ATMs offer foreign language service.

- ATM fees: They range from KRW 100 to KRW 1,200 depending on intra/inter-bank transactions, working/non-working hours, purposes of ATM usage (different depending on banks, too).

- Working hours: 08:30-18:00 on weekdays, 08:30-14:00 on Saturdays (different depending on regions and branch offices running ATMs)

- Extra charges are levied on service outside working hours including service on public holidays.
- When you use an ATM card issued by another bank, the bank's efes apply to your ATM usage.

#### (4) Remittance

#### 1) When sending money overseas

- Remittance limit: You can remit up to USD 1,000 per case without any restrictions.
- Remittance method:

Telegraph Transfer (TT): Used for remittance of large sums of money or an urgent transfer of money Demand Draft (DD): Used for non-urgent remittance or a small amount of money

- Necessary documents: A foreign currency remittance application form, alien registration card, and additional documents depending on remittance purposes.
- Basic remittance information: The remitter's name, address and phone number; the receiver's name, address, phone number, bank name and address (city, region, nation), account number, the SWIFT code, and the bank code
- Take note:
- A foreign currency remittance/payment application should be filled out in English.
- The recipient's English name and account number must be accurate.
- The bank account holder and the recipient's name must be the same.
- Be sure to write down the receiver's bank and its branch office as well as the nation correctly.
- Remittance to some countries including Myanmar, Libya, Iran and Sudan is currently not allowed.

#### (2) When receiving money from overseas

- Notify the remitter in advance: The recipient's bank name in English, the bank's head office address, his/her account number, the SWIFT code, the recipient's English name
- Necessary documents to receive remittances: those that can justify overseas remittances (export contract, service contract, etc.)\*

\* Necessary documents may vary depending on the remittance amount. Contact your principal bank in advance.





If you have further questions please contact



+82-1600-7119

or visit



www.investkorea.org

## Is it possible to notify foreign investment online or in foreign countries?

Every month, Invest Korea provides answers to some frequently asked questions submitted by foreign-invested companies in Korea and potential investors.

Is it possible to notify foreign investment online or in foreign countries?

Currently, notification of foreign investment cannot be filed online. In principle, foreign investment cannot be notified in countries outside of Korea, either.



 However, a foreign investment notification can be filed in certain countries where the Korea Trade-Investment Promotion Agency (KOTRA) operates overseas FDI offices to render support to foreign investors. The list of such overseas FDI offices is available on the Invest KOREA website (www.investkorea.org ► How We Can Help ► About Us ► Headquarters and Global Network).

\* Delegated agencies receiving FDI notification: KOTRA (including its overseas FDI offices) and domestic banks (16 foreign exchange banks and 22 domestic branches of foreign banks) entrusted by the Minister of Trade, Industry and Energy (Article 31 of the Foreign Investment Promotion Act, Article 40(2) of the Enforcement Decree of the Act, and attached Table 4 of the Rules on Foreign Investment)

KOTRA's 36 Overseas FDI Offices (Mar, 2022)

Region	Country	Overseas FDI Offices (Cities)
	US (7)	New York, Silicon Valley, LA, Chicago, Dallas, Detroit, Washington
orth America	Canada (2)	Toronto, Vancouver
	Germany (3)	Munich, Frankfurt, Hamburg
	UK	London
	France	Paris
	Sweden	Stockholm
	Denmark	Copenhagen
Europe	Spain	Madrid
	Netherlands	Amsterdam
	Belgium	Brussels
	Italy	Milan
	Switzerland	Zurich
	Austria	Vienna
	Singapore	Singapore
	Australia (2)	Sydney, Melbourne
	Japan (4)	Tokyo, Osaka, Fukuoka, Nagoya
Asia	China (5)	Hong Kong, Shanghai, Beijing, Qingdao, Guangzhou
	Taiwan	Taipei
	UAE	Dubai

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# **Regional Boon**

'Coffee City' Gangneung in Gangwon-do Province

Located in Yeongjin Beach in Gangneung, famed for being the site of a classic K-drama 'Goblin' (2020) is Bohemian Coffee Roasters, established and run by Park Ichu. Park, as the next section will corroborate, is one of Korea's first-generation coffee makers.

#### **Grandiose Factories**

Terra Rosa has emerged as one of Korea's most recognized coffee franchises. Unlike most other franchises, it is known for specialty and top-grade quality—and of course, its Gangneung origins. Though Terra Rosa cafes have now taken residency in certain, albeit limited parts of Seoul, the true brand experience of the coffee-making brand is offered only in its Gangneung locales.

#### Romance in the Air

Gangneung is a hot spot for couples, especially youngsters traveling together for the first time or on their honeymoons. This is hardly surprising for those that have met the breezy coolness of the region's fresh area, or the picturesque cafes ensconced in nature.

On Anmok Beach is Gangneung Coffee Street. Aligned with cafes and replete with the aroma of coffee, occasionally complemented by a touch of sweetness let on by Korea's ever-expanding assortment of seasonal drink and coffee variations, it is hard not to bask in the moment to indulge your senses.

As such, public transportation options are multiple, especially those coming to and from Seoul (train, express bus, subway or metro, and you-name-it).

#### **Municipal Support**

When brewed coffee was much more scarce in 1980s Korea, especially in contrast to its seemingly ubiquitous nationwide presence of late, coffee was more often accessed through vending machines. In fact some of them, either reconstructed in vintage fashion or kept in their original, antiquated forms, still align Gangneung's oceanside. Afterwards, the region's reputation for coffee spread bit by bit, bolstered by the arrival of famous baristas. Bolstered by baristas who were of a type Korea hadn't yet been home to, the otherwise tranquil region northward from Seoul (Gangwon-do Province) started blossoming into a lively coffeemaking scene — where of course, tasting, enjoying and competing consequently arose as the mainstay leisure afforded by the locale.

It also helped that the government from 2009 began hosting the Gangneung Coffee Festival, which considerably expanded the scope of visitors and tourists. From





being a prime spot recognized amongst Koreans, Gangneung went on to welcome a much broader range of visitor demographics and nationalities. It is perhaps not so much of an overstatement to call either the city of its signature festival a contributing factor to the rise of coffee culture in mainstream consciousness and enjoyment. To this day, the said festival remains a grand-scale occasion attracting more than 400K people.

#### Prowess of 'Coffee Capital'

Indeed, it is quite a feat to harbor not only such renowned brands plus the nation's first coffee-focused museum, but also such a flourishing industry for a suburb populated by less than 250K people.

#### **To Savor & Caffeinate**

It may seem, for the above developments as of late,

that coffee is a contemporary boon for Gangneung. Contrarily, its coffee—more precisely, drinks for savoring purposes as to include tea—tradition stems further back.

Pyeongchang and Gangneung regions have long been famed for clean and pure water, which has been the primary contributor to the development of Gangneung's tea culture. Gangneung coffee has gotten a boost for the same reason.

Once coffee culture seeped into the mainstream Korean populace, literary circles—usually comprised of artists, scholars and of course art scholars, were the first to engage, at least on a visible level, with one another through meetings around coffee. Such circles, deemed to have characteristics comparative or akin to the characteristics of ancient seonbi—with most being men at the time—frequented cafes as their main hangout spots in the 1930s. In a star-aligned coincidence, Gangneung is also known to be where particularly many literati originated.

Coffee was considered a breed of tea, as its ancient

name—as per the Joseon colloquial Gabaecha suggests. In that sense, it is hardly surprising how coffee has risen to become an icon of Gangneung, which has a solid history of tea culture.





Source: Excerpt from "Regional Boon" Written by Lee Jisung, Photographed by Studio Kenn, KOREA (March 2021), Korean Culture and Information Service (KOCIS)

# **IK's Services**

#### Foreign Investment Ombudsman

The Office of Foreign Investment Ombudsman is an organization established in 1999 to provide close aftercare support and grievance resolution services for foreign-invested companies, and is dedicated to resolving any difficulties that foreign-invested companies face while doing business in Korea.

#### **One-Stop Service for Foreign Investors**

The Inbound Investment Consulting Department not only assists foreign investors and foreign-invested companies in the investment review and implementation stage, but also offers customized services to help foreign investors and their families get comfortably settled in Korea.

#### Invest KOREA Market Place (IKMP)

IKMP is a project aimed at discovering promising Korean SMEs seeking to attract foreign investment and matching them with foreign investors who have compatible needs. Projects looking for investment are posted on our website at *www.investkorea.org*.

#### Job Fair for Foreign-Invested Companies

IK organizes regular job fairs to help foreign-invested companies discover qualified local talent, and job seekers find employment through job consultations, on-site interviews, and more.



### Invest KOREA Plaza (IKP)

**Invest KOREA's Services** 

Invest KOREA Plaza (IKP) is Korea's first facility dedicate to the incubation and investment of foreign investor. Each year, more than 40 foreign-invested companies rent out offices in the plaza and utilize IK's one-stop service.

IKP also provides serviced offices, business lounges, video conference rooms and a shower and sleeping lounge to maximize convenience for foreign investors.

#### **IKP Offices for Lease**

#### Foreign-invested companies

Companies planning to notify investment: Those who expect to report foreign direct investment of which the arrived amount is over USD 100,000 within 1 year of move-in.

#### **IKP Occupancy Procedure**

Counseling in occupancy  $\rightarrow$  Application for occupancy  $\rightarrow$  Screening committee evaluates application  $\rightarrow$  Result notification(result confirmed in 1-2 weeks)  $\rightarrow$  Conclusion of lease contract  $\rightarrow$  Move into IKP



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#### KOTRA has 127 overseas offices and 10 headquarters worldwide

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