CURRENT STATUS OF GREEN FINANCE DEVELOPMENT IN SOUTH KOREA AND PROSPECTS FOR CHINA-SOUTH KOREA GREEN FINANCE COOPERATION

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With countries around the world increasingly prioritizing climate change mitigation and sustainable development, the development of green finance is gaining momentum. Our institute is releasing a series of viewpoint articles on global green finance development, aiming to introduce the development of green finance in major economies worldwide to relevant stakeholders in China. The articles summarize the experiences and insights from various countries' green finance development and explore the prospects for cooperation between China and the examined countries in the field of green finance. This article is the seventh in the series, introducing the current status of green finance development in South Korea and prospects for China- South Korea's green finance cooperation.

Background

South Korea is located in the northeastern part of the Asian continent, on the southern part of the Korean Peninsula. It has a total area of approximately 100,000 square kilometers and a population of around 52 million as of March 2021. South Korea has limited natural resources, with coal being the sole energy mineral. The country heavily depends on imports to meet its petroleum consumption, making it the world's fourth-largest oil-importing nation of oil.

South Korea's economy began to take off in the 1960s and experienced sustained high-speed growth from the 1970s until the Asian financial crisis in 1997. During this period, the per capita Gross National Product (GNP) increased from $87 in 1962 to $10,548 in 1996, creating the "Miracle on the Han River."

South Korea is a founding member of the Asia-Pacific Economic Cooperation (APEC), the World Trade Organization, and the East Asia Summit. It is also a member of significant international organizations, including the G20 and the United Nations.

South Korea, due to its rapid economic development and urbanization, became the fastest-growing greenhouse gas (GHG) emitter among OECD countries (Bloomberg New Energy Finance, 2013). As of 2014, South Korea ranked as the 13th largest economy in the world, 9th in petroleum consumption, and 8th in electricity consumption (Greenhouse Gas Inventory & Research Center of Korea, 2017; Korea Energy Agency, 2017). 85% of South Korea's greenhouse gas emissions come from fossil fuels. With limited domestic natural resources, approximately 95% of the country's energy needs are met through imports (Korea Energy Economics Institute, 2018), making the economy highly sensitive to energy price fluctuations (Ministry of Strategy and Finance, 2014).

In 2008, when international climate negotiations faced challenges in advancing the second commitment period of the Kyoto Protocol and the parallel negotiations of the United Nations Framework Convention on Climate Change's long-term cooperative action, South Korea's President at the time, Lee Myung-bak, saw an opportunity for development and recognized the need to explore the path of "economic transformation." As a result, South Korea initiated the "Low Carbon Green Growth Strategy." President Lee considered low carbon green growth as the "axis" of the country's new development vision. To effectively implement this fundamental national development strategy, in September of the same year, the National Energy Commission approved the "First Stage National Energy Basic Plan (2009-2020)," which aimed to significantly increase the share of new and renewable energy in the energy mix. Subsequently, South Korea announced a legislative preview of the "Climate Change Basic Act" to provide legal basis for implementing the "Low Carbon Green Growth Strategy" through legislation (曹世功, 2008).

In 2009, the "Regulations on the Establishment and Operation of the Green Growth Committee" were promulgated by presidential decree. The "National Strategy and Five-Year Plan for Green Growth (2009-2013)" developed under these regulations focused on building a system for green development. It outlined the blueprint for green development in South Korea through three major strategies and ten policy directions, aiming to become one of the world's top seven green nations by 2020 and one of the top five by 2050.

The plan had a projected expenditure of 107.4 trillion Korean won, equivalent to 6% of South Korea's GDP, and was expected to create millions of job opportunities. In 2010, the Green Growth Committee began implementing the "Framework Act on Low Carbon, Green Growth," which was based on the revision of the Climate Change Basic Act initiated in 2008. According to this act and its enforcement decree, South Korea has been developing a national climate change adaptation plan every five years starting from 2010.

In 2014, South Korea's second five-year action plan for green growth defined five policy directions: effectively reducing greenhouse gas emissions, building a sustainable energy system, establishing a dynamic green industrial ecosystem, developing a sustainable green society, and enhancing global green cooperation. The third five-year plan in 2019 was aimed to build an inclusive green nation. In June 2015, South Korea submitted its Intended Nationally Determined Contributions (INDCs) to the United Nations, setting an overall goal of reducing greenhouse gas emissions by 37% compared to the Business-As-Usual (BAU) level of 850.6 MtCO2eq by 2030. In April 2016, South Korea signed the United Nations Climate Change Agreement, also known as the Paris Agreement, becoming the 97th country to join. Seizing this opportunity, South Korea developed the "2030 National Greenhouse Gas Emission Reduction Roadmap" and launched sectoral implementation plans, with the power generation sector having the largest greenhouse gas emission reduction target of over 19%. In 2020, South Korea updated its Nationally Determined Contributions (NDCs) and pledged to reduce the country's total greenhouse gas emissions by 24.4% by 2030 compared to 2017 levels (709.1 MtCO2eq). Additionally, South Korea conducted a national climate change risk assessment in 2019 and published the "2020 Korea’s Climate Change Assessment Report" in July 2020 to enhance climate adaptation capacity across various sectors.

However, the current industrial structure in South Korea still relies on the support of fossil fuels, and greenhouse gas emissions are still increasing. From 2000 to 2017, South Korea's greenhouse gas (GHG) emissions steadily increased at a rate of 2% per year (Government of the Republic of Korea, 2020). In July 2020, the Korean government introduced the "Korean New Deal" plan, which aims to invest over 100 billion US dollars to promote post-pandemic economic and social recovery and transformation. President Moon Jae-in stated that the Korean New Deal would lay the foundation for the country's next 100 years. The "Green New Deal" within the new policy has the largest investment amount, totaling 63 billion US dollars, primarily focusing on three major areas: green transition of infrastructures, low-carbon and decentralized energy, and green industry innovation. In July 2021, the Korean New Deal Strategy Meeting finalized "Korean New Deal 2.0," increasing the initial budget from 160 trillion Korean won to 220 trillion Korean won (approximately 1.24 trillion Chinese yuan).

On October 28, 2020, President Moon Jae-in announced that South Korea would actively respond to the climate crisis and achieve carbon neutrality by 2050 in collaboration with the international community. In December of the same year, South Korea reaffirmed its commitment to achieving carbon neutrality by 2050 in the "National Carbon Neutrality Strategy 2050" and established a long-term low-carbon development strategy. On August 31, 2021, the South Korean National Assembly passed the "Carbon Neutrality and Green Growth Act," becoming the 14th country in the world to commit to achieving carbon neutrality by 2050.

Overview of Green Finance Development in Korea

South Korea is an Asian representative country of a government-led market economy development model, and it has also adhered to this model in developing green finance. Under government leadership, South Korea has achieved rapid legalization and a well-established legal system for green finance, with clear institutional arrangements for environmental information disclosure. South Korea, under the guidance of the "Basic Act on Low Carbon Green Growth," has implemented various online platforms to enhance the dissemination of green financial knowledge, promote green product awareness, facilitate green certification processes, and encourage the sharing of environmental information. In terms of the green finance market, South Korea has developed a comprehensive system of green financial products and continuously pursues product innovation. At the same time, South Korea's carbon market represents the first nationwide carbon emissions trading system in Asia, with a scale second only to the European Union's carbon market, indicating rich experience in carbon market development.

Green Finance Policy and Strategy

Green Finance Related Policies

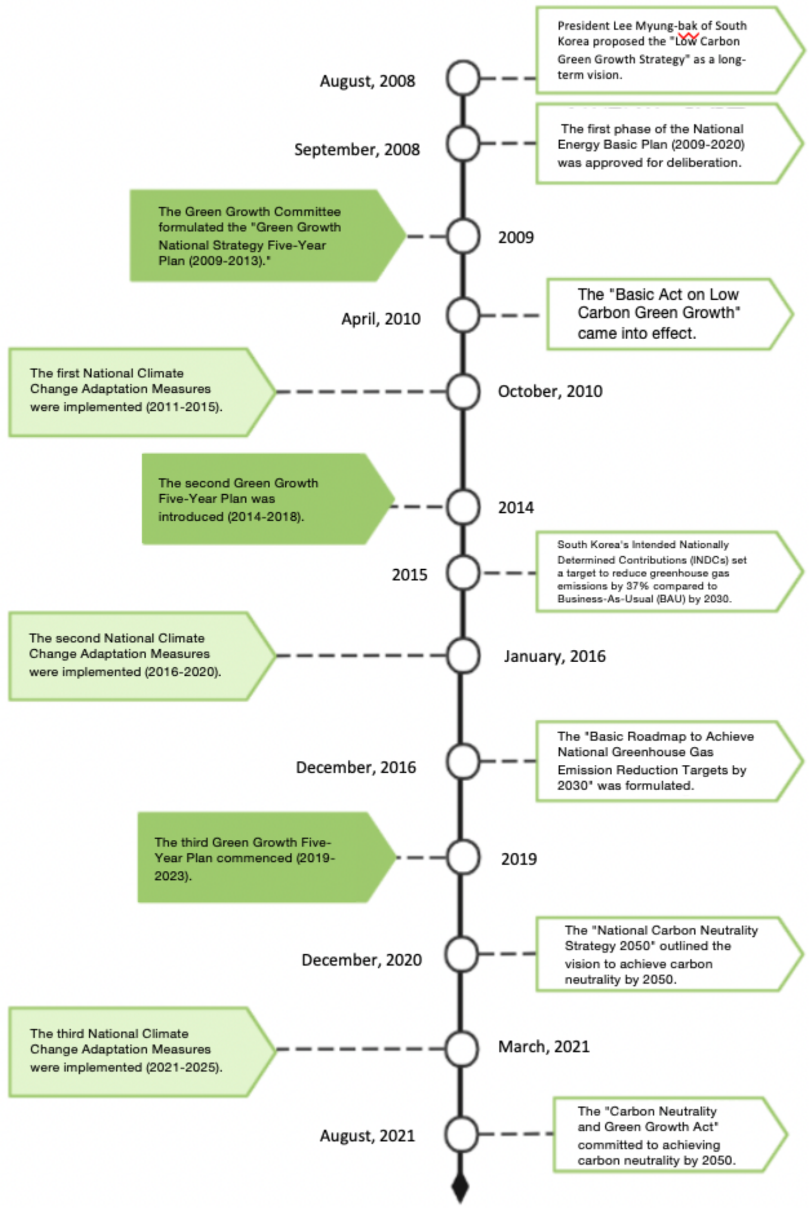


Figure 1. Timeline of South Korea's Green Development Policies
Data source: Database of International Institute of Green Finance (IIGF)

Currently, the strategic planning and related policies for the development of green finance in South Korea are mostly embedded within the aforementioned policies for green growth and low-carbon development. The year 2009 marked the inception of green finance development in South Korea. In early 2009, the Lee Myung-bak administration issued a presidential decree titled "Regulations on the Establishment and Operation of the Green Growth Committee" and established the "Green Growth Committee" as a presidential institution on February 16th. In the same year, the Green Growth Committee formulated the "National Strategy and Five-Year Plan for Green Growth (2009-2013)," which specifically outlined concrete measures to actively guide green investments and accelerate the development of green finance. These measures included activating emissions trading markets, revitalizing green finance, and establishing green finance infrastructure, among others.

Time	Name of policy/law	Green-finance related content
2009	First Five-Year Plan for Green Growth	• Activating emissions trading market; • Revitalizing green finance; • Establishing green finance infrastructure.
2010	Basic Act on Low Carbon Green Growth	• Providing financial support for the green economy and green industries; • Developing new financial products for supporting low-carbon discharge and green growth; • Encouraging private investment in low-carbon and green growth infrastructure projects; • Establishing a carbon market and stimulating transactions.
2014	Second Five-Year Plan for Green Growth	Establishing technology-centered financial infrastructure
2016	"Stewardship Code" for institutional investors	Introducing institutional investors to make contributions to effectively reducing greenhouse gas emissions by companies.
2017	Environmental Technology and Industry Support Act	The Ministry of Environment can establish and operate a financial support system for green management companies. Financial institutions are required to make efforts in environmental responsibility investments. The Ministry of Environment can support and revitalize the environmental responsibility investments of financial institutions through the establishment of a green categorization system and a standard evaluation system for assessing corporate environmental performance.
2019	Third Five-Year Plan for Green Growth	Strengthening the construction of green finance infrastructure, a fund of 50 trillion Korean won will be provided within three years to expand investments in green certification technologies, environmental innovations, air pollution prevention, and greenhouse gas reduction equipment.
2020	Green New Deal	Providing green financial consumer products for residents, such as loans for renewable energy and energy-efficient buildings. Establishing a public-private joint fund of 215 billion Korean won to support the development of green enterprises. Introducing 1.9 trillion Korean won in loans for green initiatives, including environmental pollution prevention and control by businesses.

Table 1: Green finance-related policies in Korea (Source: International Institute of Green Finance)

In January 2010, the "Basic Act on Low Carbon Green Growth" was issued in South Korea. Article 28 of the Act stipulates that the South Korean government shall establish and enforce financial measures to facilitate low carbon discharge and green growth. These measures include providing financial support to the green economy and green industries, developing new financial products for supporting low-carbon discharge and green growth, encouraging private investment in projects for the establishment of infrastructure for low-carbon discharge and green growth, reinforcing of the public disclosure system for corporate green management-related information, expanding financial support for green management companies, and establishing a carbon market to stimulate trading. Based on this, state-owned financial institutions in South Korea, such as financial corporations and the Korea Export-Import Bank, have formulated support measures for the green industry. These measures include expanding credit guarantees and waiving guarantee fees, among others.

In 2014, South Korea released its second five-year action plan for green growth, proposing the expansion of financial policies targeting the green industry and the establishment of technology-centered financial infrastructure. In 2016, the Financial Services Commission issued a draft of the "Stewardship Code" for institutional investors to bind institutional investors to their investment responsibilities and to contribute to the effective reduction of corporate greenhouse gas emissions through the introduction of institutional investors. In January 2017, the South Korean government revised the implementing regulations of the "Environmental Technology and Industry Support Act," which required financial institutions to make efforts in environmental responsibility investments. In 2019, the third five-year plan for green growth in South Korea reiterated the importance of strengthening the construction of green financial infrastructure. Within three years, a fund of 50 trillion Korean won would be provided to expand investments in green-certified technologies, environmental innovations, air pollution prevention, and greenhouse gas reduction equipment. The plan also emphasized the need to enhance the disclosure of climate and environmental information by financial institutions and businesses. In the same year, the Financial Stability Board recommended the implementation of Climate-Related Financial Disclosure (CRFD), which required all companies, including financial firms, to proactively disclose climate change-related risk information.

Additionally, efforts would be made to enhance financial support for the overseas expansion of green industries. Each year, public-private joint policy funds of over 10 billion Korean won (with government contributing 60% and private investment 40%) would be established to continuously invest in environmental industries and overseas environmental projects. These funds would act as a catalyst to develop small and medium-sized environmental enterprises into leading players in the industry, fostering their export capabilities and overseas market entry. To support the overseas development of new energy industries, the government would provide personalized overseas information and offer financial consultation assistance.

In 2020, the Green New Deal outlined the provision of green financial consumer products for residents, such as loans for renewable energy and energy-efficient buildings to promote the coordinated development of the green industry chain from the supply side to the consumption side. The government also introduced 1.9 trillion Korean won in loans for green initiatives, including environmental pollution prevention and control in enterprises, and established a 215 billion Korean won public-private joint fund to support the development of green

	Investment projects	Main contents of the projects	Investment amount (in billion US dollars)
Green transformation of infrastructure	Renovating zero-energy public facilities	Installing renewable energy generation equipment in over 230,000 public rental housing units, kindergartens, and other old buildings	53
	Restoring urban ecosystems	Developing 25 green smart cities	21
	Establishing clean and safe water management systems	Constructing water supply systems based on ICT and AI	29
Low-carbon, distributed energy	Building smart grids	Establishing renewable energy generation and storage systems in 42 island regions	17
	Promoting the use of renewable energy and supporting the transition to public transportation	Conducting feasibility studies for offshore wind power in over 13 regions	78
	Expanding the supply of electric and hydrogen fuel cell vehicles	Adding 1.13 million electric vehicles and 200,000 hydrogen fuel cell vehicles	111
Green industry innovation	Establishing low-carbon, green industrial parks	Creating 10 green and smart industrial parks and 1,750 green factories	31
	Investing in green technology R&D and promoting green finance	Researching carbon capture and storage technologies; providing $1.6 billion in loans to support green industries	23

Figure 2. Details of the Green New Deal (Source: Korean New Deal)

businesses. In the "Social Innovation" section of the "2050 National Carbon Neutral Strategy," a separate green finance strategy is outlined, highlighting four policy measures to promote green finance: mobilizing green finance, establishing taxonomy for green finance, better access to ESG information through the Task Force on Climate-related Financial Disclosures (TCFD), and scaling up green finance infrastructure. In December of the same year, the Ministry of Environment, Financial Services Commission, Korea Environmental Industry & Technology Institute, and Korea Exchange jointly issued the "Green Bond Guidelines," which specify the definitions and issuance requirements for green bonds.

In April 2021, the Republic of Korea's "Environmental Technology and Industry Support Act" added Article 10, Paragraph 4, which requires financial institutions to make efforts in environmental responsibility investment. It also specifies that the Ministry of Environment may support and promote financial institutions' environmental responsibility investment through the establishment of a green classification system and a standard evaluation system for assessing corporate environmental performance.

Green Financial Infrastructure Development

In terms of establishing institutions related to green finance, South Korea has set up the Environmental Information Disclosure System (www.env-info.kr). This information system is operated by the Korea Environmental Industry & Technology Institute (KEITI) and aims to enhance the awareness of voluntary environmental management among businesses, facilitate communication between the government and the public in the environmental field, develop nationwide environmental management infrastructure, establish independent environmental management systems, and provide verified environmental information for green lending and investment activities by financial institutions. Institutions that are required to disclose environmental information must register the previous year's environmental information on the Environmental Information Disclosure System by the end of June each year. The information is then validated by technical personnel and made available to the public in December. The disclosure of environmental information is categorized into mandatory and voluntary disclosure, which may vary across different industrial sectors (see Table 2). Since the pilot phase of this system in 2008, the scope of organizations disclosing environmental information has gradually expanded. As of 2019, the number of registered organizations in this information system was 1683 (ENV-INFOR SYSTEM, 2021).

In 2009, under the leadership of the Green Growth Committee in South Korea, the Korea Green Finance Association was established, consisting of various financial sectors such as banking, securities, and insurance. The association aimed to jointly explore strategies for promoting low-carbon green growth and the development of green finance. The Green Growth Committee, on the other hand, was primarily responsible for strategic formulation. In the same year, they released the "National Strategy for Green Development and 5-Year Plan," stating that South Korea aimed to become the world's 7th largest "green nation" by 2020 and the 5th largest by 2050. Additionally, the Ministry of Environment in South Korea has played an important role in the development of green finance. In 2018, the ministry took over the management authority of the carbon emissions trading system from the Ministry of Strategy and Finance. On July 12, 2018, they announced the second round of carbon quota allocation plan.

In 2010, South Korea officially began implementing a unified standard green certification system. The Korea

Institute for Advancement of Technology (KIAT), under the supervision of the Ministry of Knowledge Economy, was responsible for the review and certification of green certification. The certification system primarily focused on four aspects: green technology, green products, green industries, and green enterprises (Wang Xingshuai & Wang Bo, 2008). In 2015, a green certification website was established to provide comprehensive information related to green certification.

In 2011, based on the "Environmental Technology and Environmental Industry Support Act," the green management company's financial support system, enVinance (environment + finance), was established. It utilizes environmental information held by government agencies as a basis for evaluation. The evaluation information mainly includes three assessment modules: environmental management level (air, climate change, water pollution, hazardous chemicals, waste), environmental business activities (environmental certification information, etc.), and environmental pollution risks. The final assessment results are provided to financial institutions that have signed the "Green Finance Diffusion Convension". Additionally, the Korea Exchange (KRX) will issue ESG disclosure guidelines to encourage voluntary disclosure by listed companies until 2025. From 2025 to 2030, listed companies that are part of the Korea Composite Stock Price Index (KOSPI) and have total assets of 20 trillion Korean won or more will be required to disclose their investment or company-related data and information related to ESG. Subsequently, this requirement will be expanded to cover all listed companies in Korea.

In June 2020, the Korea Exchange (KRX) launched a platform dedicated to Socially Responsible Investing (SRI) bonds to promote green, sustainable, and social bonds. Issuers can register their bonds on the platform by demonstrating compliance with international standards such as the Green Bond Principles by the International Capital Market Association (ICMA) or the Climate Bonds Standard by the Climate Bonds Initiative (CBI) and completing the review process. As of January 2021, approximately 550 products were registered on the platform (Uhrynuk & Burdulia, 2021).

Content	Projects	MANUFACTURIN	PUBLIC ADMIN	EDUCATION	HEALTHCARE	OTHER SERVICES	OTHER INDUSTRIES
Company profile	Current business status	●	●	●	●	●	●
	Status of environmental awards and conventions	○	○	○	○	○	○
Green management system	Voluntary commitments, strategies, government targets	○	●	○	○	○	○
	Specialized organizations, education and training, internal audits, etc.	●	●	●	●	●	●
Resources/Energy	Technological investments	●	○	○	○	○	●
	Amount of raw materials used	●	-	-	-	-	●
	Water consumption	●	●	●	●	●	●
	Energy consumption	●	●	●	●	●	●
	Investment in renewable energy and adoption of technology	○	○	○	○	○	○
Greenhouse gases/ Environmental pollution	Investment and technology adoption for greenhouse gas emissions reduction	○	○	○	○	○	○
	Level of greenhouse gas management and emissions	○	○	○	○	○	○
	Investment and technology adoption for reducing environmental pollution	●	○	○	○	○	●
	Environmental pollution control facilities and blue measurement systems	●	○	○	○	○	●
	Air pollutant emissions	●	-	-	-	-	●
	Water pollutant emissions	●	○	○	○	○	●
	Waste generation	●	●	●	●	●	●
	Chemical emissions	●	○	○	●	○	●
	Land, noise, and other pollution management	○	-	-	-	-	○
Green products and services	Investment in green product, service development and technology adoption	○	-	-	-	-	○
	Green design (environmentally friendly design)	○	-	-	-	-	○
	Third-party certification and Type II certification products)	○	-	-	-	-	○
	Status of green procurement directive operations	○	●	○	○	○	○
	Supplier environmental information management and environmental assessment	○	-	-	-	-	○
	Status of environmental technology and education support	○	-	-	-	-	○
Social and ethical responsibility	Cases of violation of environmental regulations domestically and internationally	●	●	●	●	●	●
	Publication of environmental (sustainability) reports	○	○	○	○	○	○
	Response to stakeholder requests for environmental information	○	○	○	○	○	○

Note: ● Mandatory disclosure ○ Voluntary disclosure - Not applicable

Table 2. Mandatory and Voluntary Disclosure Initiatives by Sector
Data source: ENV-INFOR SYSTEM

In August 2020, the South Korean government launched a public-private joint green finance working group, with the Financial Services Commission as the chair, to discuss measures to promote green finance in both public and private sectors and enhance the current regulatory framework. The working group decided to establish green finance units within government-supported financial institutions and, to this end, established a green finance advisory organization in May 2021 to develop a comprehensive coordination framework for the Korean green finance strategy and facilitate information sharing among relevant departments. In order to facilitate information sharing and fund matching among stakeholders such as green businesses, financial institutions, and investors, authorities also plan to establish a green finance online platform.

Korean Green Finance Market

Participation in international green finance initiatives

Currently, the South Korean government has actively adjusted its energy structure and implemented measures such as increasing the proportion of new energy and renewable energy, leading to the continuous expansion of the green finance sector. With the deepening of South Korea's green finance innovation, a comprehensive system of green financial products has been established. The Korea Export-Import Bank issued Asia's first green bond, financial institutions have introduced innovative green loans such as "energy-saving loans," and the government and financial institutions jointly invested 260 billion Korean won to establish the "New Green Growth Energy Fund." In the insurance industry, there is not only the implementation of environmental liability insurance under the "Act on Liability and Relief for Damage Caused by Environmental Pollution," but insurance companies are also actively addressing climate change through ESG management and green investments. Furthermore, South Korea offers a variety of green financial products for individuals, including green savings, green credit cards, and green vehicle insurance, achieving innovation in green finance.

As the first country in Asia to establish a carbon market, South Korea's carbon emissions trading system provides valuable lessons for other nations. Firstly, it has established a well-defined legal framework specifically tailored for this purpose. Secondly, it has developed comprehensive complementary systems for the carbon market. Thirdly, it has implemented flexible compliance and offset mechanisms and introduced international emission reduction projects. Additionally, South Korea continuously improves its public information disclosure and green certification systems. For example, the green management company enVinance in South Korea collects and analyzes environmental information from companies based on the Framework Act on Low Carbon Green Growth and the Environmental Technology and Industry Support Act. It provides environmental performance assessment reports to corporations and commercial banks.

Green bonds

Despite having an early start, South Korea's current level of green bond issuance does not stand out significantly on a global scale. As of March 2021, the cumulative issuance of green bonds in South Korea amounted to $15.4 billion, accounting for approximately 1.3% of global issuance. In the Asia-Pacific region, South Korea ranks fifth after China, Japan, Australia, and India. A total of 55 green bonds have been issued in South Korea. In the first quarter of 2021, 24 green bonds were issued with a total issuance volume of $5.9 billion (Climate Bonds Initiative, 2021). In terms of policy formulation, the "Green Bond Guidelines" provide a definition for green bonds. These guidelines define green bonds as bonds that raise funds for "green projects" aligned with six environmental objectives, including climate change mitigation, climate change adaptation, natural resource conservation, biodiversity protection, pollution prevention, and transition to a circular economy. The guidelines recommend that green bond issuers establish their own green bond framework, which includes key elements such as issuance summary, use of proceeds, project evaluation and selection process, fund management, and post-issuance reporting. Additionally, the guidelines propose that external agencies conduct reviews of eligibility, compliance, and impact assessment before and after the issuance of green bonds.

In terms of participants in the green bond market, the Export-Import Bank of Korea (KEXIM) and the Policy bank Korea Development Bank (KDB) have been leading the issuance in the South Korean green bond market. In 2013, KEXIM issued the first green bond in Asia, amounting to $500 million, which was used to finance renewable energy projects, water projects, energy-efficient lighting, and projects related to the United Nations' Clean Development Mechanism (CDM). The demand for KEXIM's first green bond issuance exceeded the supply by three times, reaching $1.8 billion. However, the second issuance was not completed until 2016. In 2016, KDB (Korea Development Bank) made its entry into the market as the third issuer of green bonds in South Korea. The bank raised $300 million through a 5-year financing initiative aimed at solar, wind, and biomass power generation facilities, with a focus on attracting global investors. In May 2018, KDB issued a 3-year green bond worth 3 trillion Korean won, carrying an interest rate of 2.35% and targeting domestic investors. KDB's involvement as the first national implementing agency gained significant attention in the South Korean green bond market (Boulle & Peck, 2018).

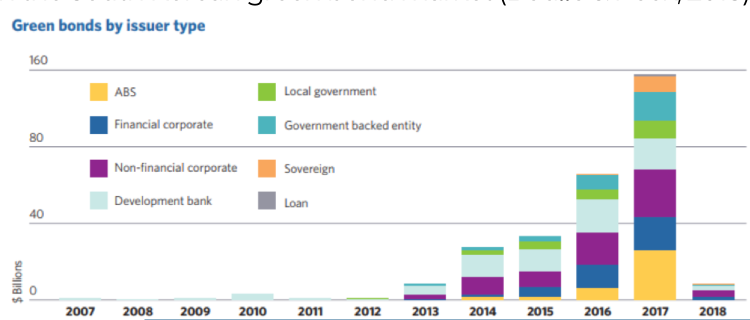


Figure 3. Green Bond Issuers in South Korea as of 2018
Data Source: Climate Bonds Initiative

In addition to traditional banking institutions, large corporations have also participated in green bond issuances. In early 2016, Hyundai Capital Services, a leasing subsidiary of the automotive manufacturing giant Hyundai Motor Company, issued $500 million in bonds for financing leases of

Number	Issuer	Issue Date	Size (million USD)	Listing Status
1	Bank of Korea	February 20, 2013	500	SGX
		February 2, 2016	400	SGX
2	Hyundai Capital	March 7, 2016	500	SGX
3	Korea Development Bank	June 27, 2017	300	SGX
`4	Hanjing International	September 25, 2017	300	SGX
5	Export–Import Bank of Korea	March 8, 2018	400	TPEx, SGX
6	Korea Water Resources Corporation	May 8, 2018	300	SGX
7	Korea Development Bank	May 29, 2018	279	KRX

Table 3. Green Bond Issuance in South Korea
Data source: Korea Exchange

hybrid and electric vehicles, marking the first green corporate bond in South Korea. Furthermore, innovative green financial products such as New Korea Group's carbon emission rights convertible bonds have received positive responses.

Furthermore, South Korea has been actively issuing green bonds overseas to attract international investors. Hyundai Capital has issued green bonds three times in Switzerland from 2016 to June 2020. In August 2017, KEXIM issued its first Indian rupee-denominated bond worth INR 3 billion (USD 50 million). In 2019, the total value of green, social, and sustainable bonds sold overseas by South Korean issuers reached USD 5.8 billion.

Green loans

Currently, green loans are the main source of green financing in South Korea, characterized by lower interest rates. Both the government and financial institutions participate as issuing entities in the market. According to the first Five-Year Plan for Green Growth in 2009, South Korea incentivizes energy-saving and emission-reducing activities in corporate production through credit advantages such as the Green Prime Rate and exemption of transaction fees. The performance of green enterprise loans is also included in the evaluation system for the operational status of banks. Additionally, the Ministry of Environment in South Korea provides loans from state-owned environmental funds to environmental industries, and eligible companies can borrow from the fund based on compliance with review conditions. The South Korean government provides low-interest loans for the construction, production, and operation of single business sites and units that individually borrow from the National Environmental Fund for the manufacturing of renewable energy equipment and are willing to install and use renewable energy. Although the economic benefits generated by green loans are similar to the economic benefits derived from the difference between general loan rates and preferential loan rates, they are more favorable to financially strong companies. This is because only such companies have the capacity to drive environmental projects and receive financial support from the government (Deokkyo Oh & Sang-Hyup Kim, 2018). Additionally, the South Korean government encourages financial institutions to issue green financial bonds to supply funds for green loan projects.

In the financial sector, there have been introduced various green certification projects for credit, energy performance contracting (EPC/EMC), green working capital loans, the financing for energy efficiency and renewable energy projects (CHUEE), and financing for carbon emissions trading and pledge. There also have been launched green loans such as "energy-saving subsidy loans" and "revenue-based loans" (Wang Xingshuai & Wang Bo, 2008). Commercial banks have implemented a green loan credit evaluation system within their systems, and they conduct risk assessments based on the enterprise environmental performance evaluation reports provided by enVinance. enVinance system, as one of the innovative green finance support tools in South Korea, providing environmental performance evaluation reports to companies. Commercial banks incorporate environmental factors into their credit assessment and conduct environmental risk assessments based on the environmental performance evaluation reports. A typical example is Shinhan Bank, which provides 100 billion Korean won of special funds for green small and medium enterprises. Based on the evaluation rating of each company, they offer loan interest rate discounts ranging from 0.4% to 1.3% and reduce guarantee requirements. The Bank of Korea implements specialized approval for green credit and prioritizes the approval of green projects in the credit approval process. In 2020, the Industrial Bank of Korea, Export-Import Bank of Korea, Agricultural Cooperative, and LG Chem signed a 550 million euro (approximately 70 billion Korean won) green loan contract for the secondary battery industry known as the "Future Strategic Industry" (Lee Jun-sung, 2020). In 2021, SK Innovation also raised $1 billion in green loans for the same sector.

Green funds

In 2015, the Korean National Pension Act, Chapter 6, Article 102(4), stipulated that ESG factors could be considered when managing and operating the National Pension Service (NPS) in South Korea. In 2017, the Korean National Pension Fund invested 200 billion Korean won in two green private equity funds (PEFs), primarily targeting domestic green infrastructure projects such as renewable energy generation and waste management (Chosunilbo, 2017). That same year, the Korea Scientists and Engineers Mutual-aid Association (SEMA) invested 40 billion Korean won in a green fund (The Bell, 2017).

The South Korean government has also established the "Green Policy Fund," which is a green enterprise investment fund formed through joint contributions from the government (public institutions) and private investors. The main green policy funds include the New Growth Engine Fund funded by the Ministry of Knowledge Economy, the Green and New Growth Engine Fund invested by the Small and Medium Business Administration, and the New Growth Power Industry Cultivation Fund funded by the Policy Finance Corporation. These funds are dispersed across multiple funds operated by leading domestic management institutions.

In addition, domestic financial institutions in South Korea are actively establishing funds for new energy and renewable energ projects. For example, the "Industrial Bank-KoFC Green Certification Private Equity Investment Trust No. 1" invests in green certified enterprises based on the Framework Act on Low Carbon Green Growth. In June 2021, Korea Investment Management (KIM) stated that its fixed-income funds dedicated to ESG investments have surpassed 1.5 trillion Korean won (approximately $1.34 billion) in assets under management. The company noted that among the 23 fixed-income funds it manages, KIM Credit Focus Feeder ESG Bond 1 has attracted the majority of investors' capital (Jie Ye-eun, 2021).

Green insurance

In terms of environmental liability insurance, in 2016, South Korea introduced the "Environmental Pollution Damage Compensation Liability and Remedies Act," which requires environmentally polluting companies that meet certain criteria to mandatory participate in environmental liability insurance. In June 2018, the Minister of Environment announced the government's initiative to take the lead in managing the operation of the environmental liability insurance system, with the intention of establishing a state-owned "Green Insurance" specialized underwriting institution funded either wholly or partially by the government. This institution is subjected to strict supervision, periodic environmental inspections, and enhanced risk monitoring to maximize the social impact of environmental liability insurance. As of the end of December 2020, 14,102 companies had joined the environmental liability insurance system, resulting in a participation rate of 97.5%. In June 2021, to strengthen the welfare and public nature of environmental liability insurance, the Ministry of Environment in South Korea made several enhancements. The deductible rate that companies are responsible for was relaxed from 0.5% of the maximum compensation amount to 0.1%. A new rate for general chemical substances was introduced to provide insurance coverage for losses resulting from accidents involving common chemical leaks. An accident-free discount rate of 5% has been introduced, whereby facilities with excellent environmental safety management will receive a discount rate of 15%, which is an increase from the previous maximum of 10%. The insurance premium discount benefits will be doubled, from 10% to 20%.

With increasing attention to corporate social and environmental responsibilities both domestically and internationally, the insurance industry is also showing an accelerated trend of focusing on and applying ESG principles. Insurance companies, as institutional investors, have made significant progress in practicing ESG investments. Most insurance companies in South Korea have committed to actively addressing environmental changes and dedicating themselves to socially responsible investments. For example, DB Insurance has pledged to invest in ethical, transparent, and environmentally friendly companies while promoting infrastructure development. As of December 2019, DB Insurance had invested 6.3 trillion Korean won in renewable energy and 3.522 trillion Korean won in green power projects (DB Insurance, 2021). DB Insurance implements an environmental management strategy based on three principles to address climate risks management, minimizing environmental footprint, and expanding green finance and environmental projects. Similarly, KB Financial Group has developed the "KB GREEN

WAVE 2030" plan, which aims to reduce carbon emissions by 25% by 2030 and expand ESG products, investments, and loans to a target of 50 trillion Korean won. As of 2020, KB Property & Casualty Insurance has increased its ESG environmental business investments to 786.8 billion Korean won, focusing on sustainable water resource management (such as sewage and wastewater recycling) and renewable energy (such as solar power).

To address climate change, KB Property & Casualty Insurance has implemented measures such as introducing an environmental management system (ISO 14001), building green energy infrastructure, promoting digital transformation and paperless practices, and conducting environmental risk management. Similar to DB Insurance, eKB Property & Casualty Insurance has made a "coal divestment commitment," which means they will not engage in any financing activities for future domestic and international coal-fired power plant projects.

Carbon market

On January 1, 2015, South Korea launched the Carbon Emission Trading Scheme (K-ETS), which became the first nationwide mandatory ETS in East Asia. At its establishment, K-ETS ranked as the second-largest national-level carbon market globally, following the European Union Emissions Trading System (EU ETS). The primary legal basis for K-ETS is the Framework Act on Low Carbon, Green Growth. The Act on The Allocation And Trading Of Greenhouse-Gas Emission Permits, enacted in 2012, along with its implementing regulations, provide comprehensive provisions for greenhouse gas quota allocation and trading, protection of the rights and interests of regulated entities, and legal responsibilities for non-compliance. These legislative measures ensure the smooth operation of South Korea's carbon emission trading system.

K-ETS is limited to companies that exceed a certain level of greenhouse gas emissions. Specifically, it applies to companies with an average greenhouse gas emissions of at least 125,000 tons of carbon dioxide over the past three years or to single business sites with an average greenhouse gas emissions of at least 25,000 tons of carbon dioxide over the past three years. A new amendment to improve the K-ETS legislation came into effect on June 1, 2020. Starting from 2021, K-ETS expanded its coverage to include new sectors and increased the emission caps. The coverage expanded from 62 industries and 589 companies to 69 industries and 685 companies, reaching a coverage rate of 73.5% of total emissions. The emission allowances increased from an average annual cap of 592 million tons in the second phase to 609 million tons. Additionally, the auctioning ratio increased from 3% in the second phase to 10%, and the carbon offset limit for controlled-emitting companies was reduced to 5% through offset mechanisms. Third-party participants, such as financial companies and institutions, are also allowed to participate in the secondary market. The allocation plan for the third phase will also introduce a futures market, but the launch date has yet to be determined.

In terms of its operation mode, K-ETS adopts a "cap and trade" system, where the total emissions are determined based on annual emission targets outlined in the greenhouse gas roadmap. The emission allowances are then allocated among companies according to industry-specific emission reduction targets. These allowances can be traded on the Korea Exchange (KRX) or in the over-the-counter market. Each company is permitted to emit greenhouse gases within their allocated allowance range and is allowed to carry forward and borrow allowances across different periods. Currently, K-ETS has established three commitment periods: 2015-2017, 2018-2020, and 2021-2025, each with detailed allocation plans. During the first period, the focus was on establishing the trading system, with 100% free allocation for all industries. The second period involved 97% free allocation and 3% auctioning, with sensitive industries still receiving full free allocation.

In addition to allowances, the South Korean government encourages the use of credit offset mechanisms to offset a portion of the emissions. In the first and second periods, K-ETS allowed controlled-emitting entities to use Korea Credit Units (KCUs) for offsetting carbon emissions. These offset credits must come from verified emission reductions generated in sectors not covered by the carbon market and are limited to 10% of the total emissions. Starting from the second period, the Korean carbon market also allows the use of Korean Offset Credits (KOCs) for trading, also limited to 10% of the total emissions. Korean Offset Credits (KOCs) have no time restrictions and can be traded outside of the formal exchange. However, they must be converted into corresponding-year Korea Credit Units (KCUs) before they can be used for compliance purposes.

In 2019, with the opening of K-ETS to international emission reduction projects, International Korea Credit Units (i-KCUs) and International Korean Offset Credits (i-KOCs) were officially allowed to enter the market. K-ETS became the first national-level carbon market to accept overseas emission reduction projects. These foreign projects must be invested in by Korean companies, and the certified emission reductions (CERs) corresponding to the equity share of the projects can participate in trading within the Korean carbon market. The emissions reductions from foreign projects cannot exceed 5% of the company's total emissions.

From the perspective of market trading, the price of Korean Allowance Units (KAUs) has shown an upward trend since the market opened in 2015 until before 2020. In January 2015, the average price of allowances was 9,700

Korean won per ton, reaching a peak of 40,800 Korean won per ton in 2019. However, with the opening of the third phase of K-ETS to third parties such as financial institutions, or due to concerns over the European Union's Carbon Border Adjustment Mechanism (CBAM), the carbon price experienced a sharp decline. As of June 23, 2021, the carbon price fell to 11,550 Korean won per ton, almost returning to the level of early 2015.

International Cooperation on Green Finance in Korea

Engagement in international green finance initiatives

As for the financial regulatory sector, in August 2015, the Korea Exchange joined the Sustainable Stock Exchanges Initiative, committing to promote long-term sustainable investments, encourage ESG disclosure by listed companies, and improve their ESG performance. In November of the same year, the Korea Development Bank joined the International Development Finance Club (IDFC). In 2019, the Bank of Korea joined the Network for Greening the Financial System (NGFS), a coalition of central banks and regulatory authorities, with the aim of participating in international discussions on financial risks related to climate and the environment and effectively addressing such risks. (Bank of Korea,2019） In May 2021, the Financial Services Commission also applied to join the NGFS to discuss and address regulatory measures related to climate and environmental financial risks, the impact of climate change on the macroeconomy and the financial sector, and the establishment of relevant climate and environmental risk databases and other issues related to green finance (Financial Service Commission，2021). In April 2021, South Korea joined the Coalition of Finance Ministers for Climate Action (FMCCAC). In November, Vice Prime Minister Hong Nam-ki emphasized the importance of policy balance, public-private sector collaboration, and international cooperation in strengthening climate action financing during the meetings of the FMCCAC and discussions on developing global baseline sustainability reporting standards (Ministry of Economy and Finance, 2021). Additionally, the South Korean government encourages financial institutions to participate in international green finance initiatives. As of December 2021, 17 South Korean financial institutions have signed the United Nations Environment Programme Finance Initiative, 16 have adopted the United Nations Principles for Responsible Investment, and 6 have endorsed the Equator Principles. In 2021, 65 institutions joined the Task Force on Climate-related Financial Disclosures, bringing the total number of South Korean institutions in the task force to 85.

Cooperation in international multilateral climate investment and financing

South Korea has demonstrated international leadership in addressing climate issues. In October 2012, South Korea's Incheon Metropolitan City overcame Germany, the second-largest contributor to climate change assistance, and successfully won the bid to host the headquarters of the United Nations Green Climate Fund (GCF). South Korea pledged to contribute $100 million to support its successful operation and subsequently initiated the construction of the "International Green Climate Finance City" in the Songdo International Business District of Incheon. According to the Korea Development Institute (KDI), the GCF headquarters is estimated to bring an annual economic benefit of 380 billion Korean won to Incheon. For South Korea, hosting the UN Green Climate Fund not only signifies its contribution to global climate change cooperation but also provides an opportunity to amplify its voice, particularly in climate financing, during global climate negotiations (Deokkyo Oh & Sang-Hyup Kim, 2018). At the 2021 P4G Seoul Summit, the Financial Services Commission (FSC) and the Korea Development Bank (KDB) jointly organized a thematic session on green finance, focusing on topics such as "climate-related disclosure and green investment" and "the role of public financial institutions in promoting green finance." At the same time, South Korea is engaged in collaborative efforts with other nations regarding carbon pricing within the carbon market.

South Korea actively provides assistance to developing countries to support their green development. The Ministry of Environment of South Korea consistently engages in high-level participation in bilateral and multilateral environmental conferences, sharing knowledge and offering numerous training opportunities for officials from developing countries to enhance their capacity building. Additionally, the ministry supports the preparation of project proposals for the Green Climate Fund (GCF) in developing countries through funding. In 2011, the Korea Green Growth Trust Fund (KGGTF) was established in collaboration with the World Bank and funded by the South Korean government. Its purpose is to expand the World Bank's global portfolio of green growth investments and mainstream inclusive green growth into the bank's lending operations. The fundamental objective of the fund is to assist the World Bank and its clients in the implementation of inclusive initiatives, strategies, and investments for promoting green growth.In December 2020, the Ministry of Economy and Finance of South Korea announced that it had decided to invest $9.8 million through KGGTF in green and digital projects in developing countries. The latest investment would involve projects in the digital, green, and healthcare sectors across 23 developing countries (Jung Min-kyung, 2020). As of September 2021, there have been a total of 165 green growth projects funded by KGGTF, with the funding support from World Bank loans reaching approximately $87 million.

In addition, the Korea International Cooperation Agency (KOICA), aims to establish friendly cooperative relationships between South Korea and developing countries and support the economic and social development of these countries. It provides funding for environmental and social protection projects in Asian, African, and Latin American developing countries to contribute to their sustainable development. In 2018, KOICA provided $229 million in climate development financing, accounting for 65.8% of South Korea's total external assistance.

Green finance multilateral and bilateral cooperation

According to the OECD's Development Assistance Committee (DAC), in 2019, South Korea has pledged to spend 30% ($1 billion) of its bilateral allocable official development assistance (ODA) on projects with climate change as a primary or significant objective, above the average of 23%. Compared to other members, Korea ranks seventh in absolute terms and tenth in terms of relative ODA to gross national income (GNI).

In terms of trilateral cooperation between China, Japan, and South Korea, the Tripartite Environment Ministers Meeting (TEMM) has been the highest-level environmental cooperation platform in Northeast Asia since its inception in 1999. TEMM has been held continuously for 18 sessions, coordinating efforts to address common environmental issues. In the "Joint Action Plan for 2015-2019," the three countries identified nine priority areas, including climate change and green economy.

In July 2008, during the Major Economies Meeting on Energy Security and Climate Change at the G8 Summit in Tokyo, then South Korean President Lee Myung-bak launched the "East Asia Climate Partnership" (EACP), aiming to explore regional strategies that create a synergistic relationship between climate and economy.On April 30, 2015, the "Tripartite Joint Action Plan on Environmental Cooperation (2015-2019)" was officially signed, outlining nine priority areas including air quality improvement, biodiversity, chemical management, and environmental emergency response. In December 2015, a memorandum of understanding was signed between the carbon exchanges in South Korea and Beijing to explore cooperation between their respective carbon markets. Additionally, in June 2016, South Korea and China held the Climate Change Cooperation Joint Committee and ETS Roundtable Meeting to exchange views on climate policies and carbon market development.

There is still considerable potential for enhancing cooperation in the capital markets between China and South Korea. Among the 21 Chinese companies listed in South Korea, only five of them are involved in the production of supporting products for the environmental industry. Furthermore, with the progress of China-South Korea cooperation under the "Belt and Road" initiative, South Korea has increased its investment in China's green industry. According to a survey by the South Korean Ministry of Commerce, in the second quarter of 2020, South Korean companies made direct investments in China amounting to $2.04 billion, with $430 million invested in the green agricultural products industry, accounting for 21.07% of the total direct investments by South Korean companies in China (Liu Xiaoju, 2021).

Experience and Cooperation Outlook

Experience in the Development of Green Finance in South Korea

The South Korean government has been actively promoting the development of green finance. Since the Green Growth Committee first proposed the development plan for green finance in 2009, the government has been working to activate South Korea's green finance market. In addition to developing the Environmental Information Disclosure System in 2013 and launching the first carbon emissions trading system (ETS) in East Asia in 2015, the government introduced the Stewardship Code for institutional investors in 2016 to encourage sustainable investment practices. Furthermore, the South Korean government has emphasized the development of green finance infrastructure by launching online platforms such as the enVinance system, Green Certification website, and Green Finance Information Portal. These platforms aim to disseminate knowledge about green finance policies and facilitate information sharing. Recently, the South Korean government is preparing for the Korean Taxonomy (K-Taxonomy) to promote sustainable financing by distinguishing between green and brown industries and activities. Overall, the South Korean government plays a leading role in the development of green finance in the country, providing guidance for the construction of a comprehensive green finance policy framework and strengthening policy coordination and resource allocation.

South Korea is not included in the list of countries obligated to mandatory emission reductions under the Kyoto Protocol. However, it has voluntarily set a target to reduce greenhouse gas (GHG) emissions by 37% compared to the Business-As-Usual (BAU) scenario. From 2009 to 2013, the South Korean government invested 2% of GDP in green development, exceeding the recommended investment ratio of 1% by the United Nations in the green sector. On July 28, 2021, South Korean lawmakers introduced a bill aimed at terminating financial support for overseas coal-fired power projects. The bill will cover all public financing institutions and companies, including Korea Electric Power Corporation, Export-Import Bank of Korea, Korea Development Bank, and Korea Trade Insurance Corporation, demonstrating the South Korean government's strong determination to promote green growth.

Overall, South Korea has made significant progress in the development of green finance legislation. In terms of macro strategies, the country has established a comprehensive legal framework for green growth through the Framework Act on Low Carbon Green Growth, providing a solid foundation for the development of green finance. In terms of pathway planning, South Korea has adopted a phased approach, setting a 5-year cycle for its green development plans. The introduction of new green policies further demonstrates the government's commitment to advancing the development of green finance in the future. Additionally, South Korea is leading in Asia in terms of environmental information disclosure requirements. Its regulations clearly outline a three-phase approach based on company size (total assets exceeding 20 trillion KRW), with the ultimate goal of mandatory environmental information disclosure for all listed companies by 2030.

Green finance products in South Korea show a wide range of options and innovative features, with active involvement in sectors like bonds, credit, insurance, and funds. For instance, the government mobilizes private investment through Public-Private Partnership (PPP) models for green finance infrastructure projects. In terms of product development, South Korea offers a wide range of innovative individual green finance products, including green savings, green credit cards, and green leasing. These products help raise awareness of energy conservation and emissions reduction among the general public, encouraging climate action in their daily lives and consumption patterns. Furthermore, South Korea boasts a leading carbon market in Asia. It effectively utilizes the national certified emission reductions (CCERs) program, which includes voluntary emission reduction projects in sectors like renewable energy, methane utilization, and forestry carbon sequestration. This stimulates emission reduction efforts among entities not covered by the carbon market, thereby lowering the overall social cost of emissions reduction.

Furthermore, South Korea places emphasis on promoting practical collaboration in green finance at bilateral and multilateral levels. In terms of international cooperation in green finance, South Korea actively assists developing countries and participates in relevant initiatives and dialogues on international green finance, establishing itself as an important advocate in the field. Taking this into account, our country should enhance the importance of climate assistance and other forms of foreign aid, actively seek a voice in international cooperation on green finance, and promote the high-quality development of the Belt and Road Initiative.

Prospects for Sino-Korean cooperation

Firstly, the official signing of the Regional Comprehensive Economic Partnership (RCEP) on November 15, 2020, laid the foundation for establishing a regional climate financing system in East Asia. As significant economies in East Asia, China and South Korea need to establish agreement on climate change matters and collaboratively advance the establishment of a worldwide green finance system. Both countries have issued clear national-level guidance on green finance policies. South Korea, as a developed country, has rich experience in constructing and innovating green finance products, and its regulatory system is relatively well-established. China and South Korea should promote mutual recognition of green finance standards and facilitate product interoperability, such as supporting Korean companies in issuing Panda bonds in China, to increase liquidity in the green finance market. The green and sustainable development of the Belt and Road Initiative will create more opportunities for financial innovation and cooperation between the two countries.

Furthermore, to ensure institutional development, it is crucial to align the green investment and financing mechanisms with international standards. The green investment and financing mechanisms of both China and South Korea should guide financial institutions to learn from international standards and establish comprehensive environmental risk management mechanisms. During the project preparation stage, it is important to differentiate projects based on environmental risks and develop targeted risk control measures while ensuring the implementation of environmental impact assessments. In terms of corporate environmental information disclosure, the China Securities Regulatory Commission (CSRC) clarified the ESG information disclosure system for listed companies in 2021, with nearly 80% of A-share listed companies disclosing environmental and social responsibility information in their annual reports. The development of South Korea's environmental information disclosure system and enVinance system also provides a reference for China's green finance system development. By establishing a comprehensive and specialized platform, more companies can be included in the scope of environmental information disclosure. Transparent information disclosure will facilitate the development of green enterprises and support their green transformation through financial assistance.

It is also important to optimize the financing environment and expand cooperation in the field of green finance market. One possibility is to support the establishment of dedicated green finance departments within financial institutions such as the Asian Infrastructure Investment Bank (AIIB) and the Silk Road Fund under the framework of the Belt and Road Initiative. Once established, these departments should focus on attracting domestic capital and forming specialized China-South Korea green investment and financing funds, while developing stringent operational regulations to ensure risk prevention and control in investment and financing activities (Liu Xiaocui, 2021).

In terms of carbon market development, China launched its national carbon market in July 2021. However, it is crucial to avoid setting excessively loose carbon trading quotas to prevent a drastic drop in carbon prices, similar to what happened in South Korea. Unlike South Korea, China has abundant domestic resources such as wind and solar power, which may limit the short-term attractiveness of international emission reduction projects. Looking ahead, the formation of a globally unified carbon market is an inevitable trend. China and South Korea can actively ooperate in the carbon market by establishing joint credit mechanisms or linking carbon markets, creating a new hub for the global carbon market. China possesses abundant low-cost emission reduction resources and can become an exporter of quotas, generating revenue, while South Korea can benefit from importing low-cost quotas. However, compatibility between the two countries' carbon markets depends on factors such as the development stages of each market, consensus on the boundaries and scope of carbon financial products and trading entities.

Current status of green finance in South Korea

South Korea has recently been focusing on its green development agenda and has made significant efforts to support the implementation of a commitment to reduce greenhouse gas emissions by 40% from 2018 levels by 2030, and to increase Official Development Assistance (ODA) for green projects.

Recent Policies

On March 25, 2022 the Basic Act on Carbon Neutral and Green Growth for Climate Crisis Response Carbon Neutrality and Green Growth Commission was established to oversee the implementation of carbon neutrality policies and plans through collaboration with different sectors of society. The commission's main functions include setting the direction for transitioning to a carbon-neutral society, promoting green growth, establishing reduction goals and plans, implementing climate crisis adaptation measures, fostering public understanding and communication, and facilitating international cooperation. The Act introduced two transition pathways (scenarios), both aiming for net-zero domestic greenhouse gas emissions. Scenario A involves phasing out thermal power generation entirely, while Scenario B focuses on utilizing various technologies like CCUS as alternatives to existing thermal power generation. (Presidental Comission on Carbon Neutrality and Green Growth, 2023).

Earlier in January 2021 the Financial Services Commission (FSC) of Korea announced that mandatory disclosure requirements for environmental, social, and governance (ESG) factors would be implemented gradually. Starting from 2025, companies with total assets of KRW2 trillion will be required to disclose their ESG information. By 2030, all listed issuers will be subject to these requirements. The initial phase in 2025 will apply to KOSPI-listed companies with assets exceeding KRW2 trillion. The scope will then expand to include companies with assets of KRW1 trillion by 2027, KRW500 billion by 2029, and eventually encompass all KOSPI-listed firms by 2030 (Pulse by Maeil Business Newspaper & mk.co.kr, 2023).

On July 5, 2022, the Sustainable Development Act was implemented in Korea, outlining several environmental, social, and governance (ESG) obligations for both the government and businesses. The purpose of the Act is to achieve sustainable development by maintaining a balance and harmony between the economy, society, and the environment. It not only establishes fundamental principles that the government must adhere to for sustainable development but also emphasizes the social responsibility of corporations and their obligation to fulfill environmental, social, and ethical responsibilities (Kim Hye Sung, Lee June Yong, 2023). Moreover, the Ministry of Environment plans to provide institutional support to assist companies in effectively addressing the growing requirements to strengthen environmental, social, and governance (ESG) practices both domestically and internationally. To achieve this, the Ministry plans to reclassify industries that necessitate environmental data disclosure by considering international developments like the sustainability disclosure standards of the International Financial Reporting Standards (IFRS). Efforts will be made to integrate these standards with relevant systems to alleviate the burden on companies. Additionally, the Ministry will offer ESG consulting services to assess the environmental management systems of 100 small and medium-sized companies and formulate improvement plans for each key aspect (Choi, Soon Young,2023).

From January 1, 2023, the Korean Green Taxonomy (K-Taxonomy) has been enforced, accompanied by a grant scheme established by the government. The scheme supports companies that fully comply with the K-Taxonomy and undergo third-party assessments by approved institutions recognized by the Ministry of Environment. The Ministry aims to offer financial assistance to companies through interest expense support for issuing green bonds. The total budget allocated for this purpose is approximately 3 trillion won, with a maximum of 300 million won per company, totaling 7.7 billion won. The Ministry of Environment, in accordance with the implementation of K-Taxonomy, will support initiatives to promote green finance through various measures. As part of this effort, a pilot program was launched in February 2023 to subsidize interest costs for green bond issuances, prioritizing small and medium-sized enterprises (SMEs). A budget of KRW 7.7 billion has been allocated for the program, along with an additional KRW 4.5 billion for green asset-backed securities issued by SMEs. South Korea's commitment to cut greenhouse gas emissions and boost financing for transition sectors presents significant opportunities for the green and transition finance market. However, the lack of a commonly agreed transition finance framework and limited participation in sustainability-linked loans pose challenges to the market's growth (Ministry of Environment, 2023).

Green Finance Development

Despite South Korea's moratorium on financing overseas coal plants, the country still heavily invests in oil and gas, ranking fourth among G20 members in fossil fuel financing. However, South Korea's conglomerates and emerging start-ups in sectors like renewable energy, drone inspection, information technology, wave energy, food upcycling, and plant-based meat production position the country to lead the global transition to a net-zero economy and enable climate technology transfer to other emerging economies (Ministry of Environment, 2023).

Starting from this year, the Ministry of Environment in South Korea has decided to provide support to qualified bond issuers by covering interest expenses of up to 300 million won ($226,586) annually (Sustainable fitch, 2023).

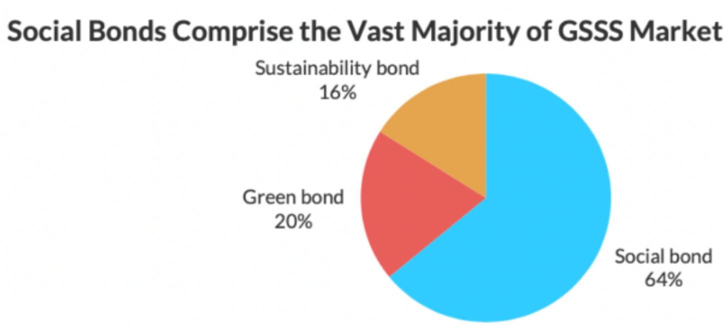
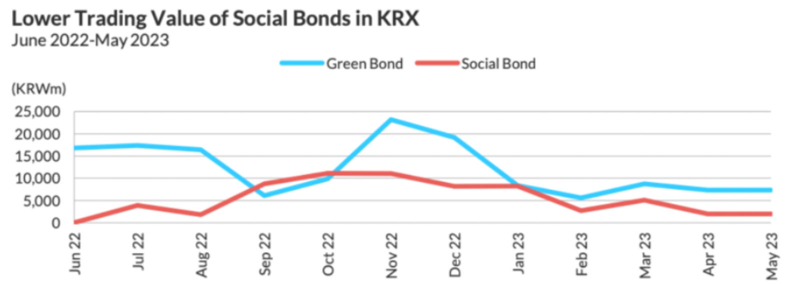


Figure 4. GSSS Market in South Korea
Source: Sustainable Fitch, EF Data

A distinctive characteristic of South Korea's labeled bond market is the significant presence of social bonds, which account for over 60% of total issuances in the categories of green, social, sustainability, and sustainability-linked (GSSS) bonds. In contrast, the global and APAC markets typically see green bonds as the dominant type of labeled bond. Green bonds make up only 20% of South Korea's sustainable debt market, while they constitute 55% of the overall GSSS market in the APAC region in 2022 (Sustainable fitch, 2023).

South Korea's sustainable debt market is primarily driven by policy-driven issuers, with government agencies and state-owned enterprises leading the way. Private sector participation in the market is relatively low, as social financing activities are seen as the responsibility of



Source: Sustainable Fitch, Korea Exchange

governments rather than the private sector. The green bond market, although experiencing significant growth, still lags behind social bonds. The South Korean government has taken steps to enhance domestic green financing capacity through the publication of K-Taxonomy Guidelines and revised Green Bond Guidelines. However, private corporates face challenges in issuing green bonds due to higher costs and limited capacity for engaging in green finance activities (Sustainable fitch, 2023).

The Ministry of Environment has a plan to support emerging green industries, aiming to boost economic growth and provide training for skilled professionals based on industry needs. They intend to provide tailored support measures such as consulting services, market development assistance, and funding for commercialization purposes. In 2023, the estimated funding for prospective and early-stage start-ups is 15.8 billion won, with individual companies being eligible for up to 250 million won. Furthermore, the Ministry plans to increase the loans available for financing these ventures from 300 billion won in 2022 to 370 billion won in 2023. In collaboration with 51 specialized universities across 13 areas, the Ministry aims to develop top-tier talent in promising fields such as chemical safety management and the circular economy. They also plan to establish professional training courses to nurture 100 individuals who can support corporate ESG initiatives (Ministry of Environment, 2023).

Regarding ESG bond issuance in Korea, there has been a decline in 2022, particularly in the issuance of green bonds and sustainability bonds. Unfortunately, there is no

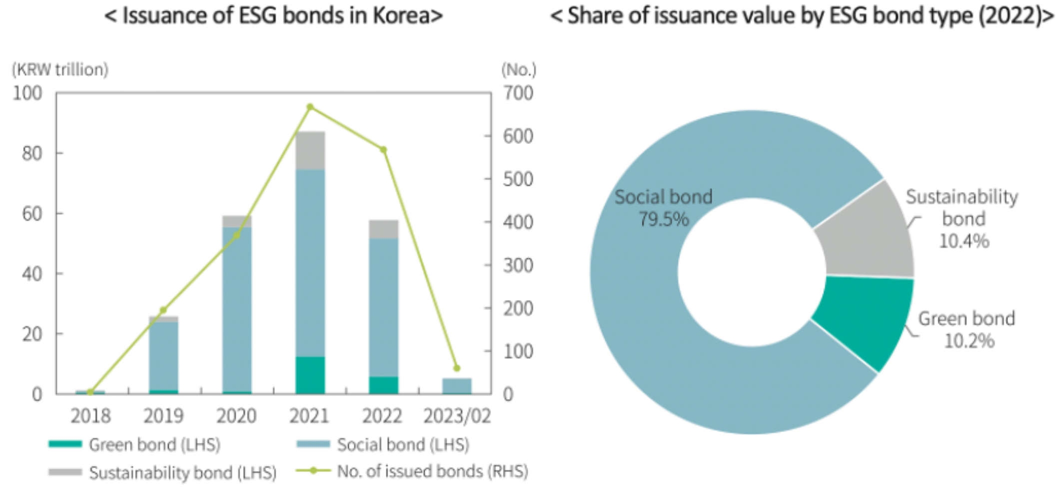


Figure 5. ESG bond market in Korea
Source: KRX, Choi, Soon Young, 2023

indication of a recovery in 2023. Between January and February 2023, the total value of ESG bonds issued in Korea was KRW 5.2 trillion, which is the lowest level since 2019. In terms of the distribution by bond type based on the 2022 issuance value, social bonds hold the dominant position with 79.5%, while green bonds represent a mere 10.2%. This stark contrast to the global ESG bond market indicates that Korean companies have not fully embraced green bonds for transitioning to low-carbon manufacturing and business structures (Choi, Soon Young,2023).

South Korea is preparing to launch a voluntary carbon market (VCM) in 2023, with the aim of expanding the range of carbon credits and accelerating progress towards achieving net-zero emissions goals. The Korea Chamber of Commerce and Industry (KCCI) will be responsible for reviewing and verifying decarbonization projects and issuing carbon credits to relevant companies, starting from March.

The VCM will work in conjunction with the government-operated carbon exchange, which currently only allows for the trading of carbon dioxide (CO2) emissions resulting from companies' production processes. The new market will enable corporations, individuals, and other investors to trade carbon credits, and the acquired certificates can be included in sustainability management reports to showcase their commitment to environmental standards. The KCCI intends to streamline the certification process for carbon reductions and has plans to establish VCMs in other regions of Asia (Jeong Ji-Eun and Hwang Jung-Soo, 2023).

Korea is currently taking significant steps in the realm of green finance, which encompasses initiatives such as the creation of a voluntary carbon market and the provision of support for green projects through mechanisms like carbon credits and green loans. Alongside China and Japan, Korea has reiterated its dedication to reducing carbon emissions and achieving carbon neutrality, thus playing a vital role as a major economy in the global fight against the climate crisis (ESCAP, 2023).

These endeavors have the overarching objectives of expanding the reach of sustainable finance, facilitating the transition to a low-carbon economy, and contributing to worldwide environmental objectives.

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