

2023 _____

Fossil Fuel Finance White Paper





Korea Sustainability Investing Forum

www.kosif.org

The KoSIF(Korea Sustainability Investing Forum), established as a non-profit organization in 2007, is dedicated to fostering sustainable communities by advancing socially responsible investment(SRI). The KoSIF engages in a range of activities, including SRI research and development, promotion, and dissemination, as well as policy development and legislative support. The KoSIF also took the lead in establishing the CDP Korea Committee to encourage environmental responsiveness among financial institutions and corporations in Korea. In addition, KoSIF contributes to enhancing sustainability by spreading global initiatives such as TCFD, PCAF, RE100, EV100, and SBTi to Korean financial institutions and corporations.



YANG YIWONYOUNG,

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Yang YiWonyoung is a proportional representative member of the 21st National Assembly and a member of the Trade, Industry, and Energy, SMEs, and StartUps Committee. She is also the principal research member of the National Assembly's Climate Crisis Green New Deal Study Group, focusing on 2050 Carbon Net-Zero and energy transition. The parliamentary office of Yang YiWonyoung collected data on the state of coal finance from public and private financial institutions and provided it to KoSIF, which is the basis for this report.

Publication Information

Title	2023 Fossil Fuel Finance White Paper
Publication Date	August 27, 2024
Content Development and Editing	Park Namyoun, Kim Minah, Song Myungeun, Kim Taehan
Design and Production	SOYA

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I Survey Overview I

- **Surveying Subject:** Korean public and private financial institutions (Respondents: Public-38, Private-92)
- **Surveying Methods:**
 - (Public) Questionnaires were sent to competent ministries with public financial institutions through the Parliamentary office of YANG YiWonyoung
 - (Private) Data were requested from the Financial Supervisory Service through the Parliamentary office of YANG YiWonyoung, and the Financial Supervisory Service collected data from each financial institution
- **Surveying Contents:**
 - | Asset Status | Balance of Financial Support (Coal, Oil, Natural Gas) | New Investment by Year (Coal, Oil, Natural Gas, Renewable Energy) | Net-Zero Target and Implementation plan | Renewable Energy Investment | Fossil Fuel Phase-Out | Coal Phase-Out
- **Target Asset Class:** PF, Corporate Loans, Corporate Bonds, Stock, and Insurance
- **Target Area:** Korean and International
- **Target Period:** From 2013 to June 30, 2023
- **Exchange Rate:** Application of Internal Standards of Each Financial Institution

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Preface

Kim Young-Ho,
Chairman of Korea Sustainability Investing Forum

Yang YiWonyoung,
Member of 21st National Assembly



Kim Young-Ho

Chairman of Korea Sustainability Investing Forum

“Fossil fuels are an energy source that is incompatible with human survival.”

In June 2023, UN Secretary-General António Guterres strongly criticized the fossil fuel industry, particularly the oil and gas sector, during a meeting with civil society organizations. He condemned these industries for prioritizing record profits while showing no real commitment to investing in clean energy. Instead, they continue to propose justifications for expanding fossil fuel use.

The Earth is rapidly warming, and the climate crisis is intensifying. However, actions to combat climate change are slow and insufficient. Fossil fuel companies are obsessed with short-term profits, pushing the planet toward a dangerous future. Financial institutions are the primary enablers of these harmful actions. They provide the capital that extends the life of fossil fuel companies. European scholar Jacques Attali has stated that “using coal is a crime.” By extension, providing financial support to coal projects is similar to financing criminal activity. A gradual but drastic reduction in fossil fuel finance, ultimately leading to its end, is essential to phasing out the fossil fuel industry.

The KoSIF has released a report analyzing fossil fuel finance in Korea. As of the first half of 2023, this financing reached a staggering KRW 331.5 Tr. This figure includes bonds, loans, project financing, equity investments, and insured amount provided by both public and private financial institutions.

This amount is more than 50% of KRW 656.6 Tr. Korean national budget for 2024. Even excluding insurance, which mitigates the risk of future losses, the figure still

reaches KRW 193.4 Tr. and has been steadily growing for years.

If this trend continues, Korean financial institutions will fail to achieve their Net-Zero targets by 2050. Even when excluding loans, equity investments, overseas projects with hard-to-track emissions, and the Samcheok and Gangneung power plants (which have the largest PF balances), financed emissions in 2050 will exceed 5.71 Million tons. This is just from coal finance. Including other fossil fuels like oil and gas makes the 2050 Net-Zero target seem like an impossible dream.

A strong institutional mechanism is needed to shift capital away from fossil fuels and toward green investments. This could include a system that requires financial institutions to assess climate risk when evaluating asset soundness. Financial supervisory authorities should oversee this process and mandate reserves based on these assessments.

If finance doesn’t change, the world won’t change. While the efforts of financial institutions are crucial, they must be supported by regulations and infrastructure. The ‘2023 Fossil Fuel Finance White Paper’ from the KoSIF provides valuable data that can help redirect capital flows toward a sustainable economy.

Yang YiWonyoung
Member of 21st National Assembly



The Politics Embracing Wind and Sun: I am Yang YiWonyoung from the Democratic Party of Korea.

According to the IPCC's '6th Assessment Report', the temperature of the Earth's surface has increased by 1.09°C from pre-industrial times(1850-1900) to the present(2011-2020). We are currently only 0.41°C away from a 1.5°C increase in global average temperature.

The international community has set a target of limiting global average temperature rise to 1.5°C by 2050, but it is predicted that the temperature will reach 1.5°C before 2040. To limit the global average temperature, increase to 1.5°C by 2050, greenhouse gas emissions must be reduced by 43% by 2030 and by 60% by 2035, compared to 2019 levels.

As the climate crisis worsens, carbon trade barriers are becoming increasingly restrictive. In addition to mandatory RE100 and ESG disclosure, the EU is introducing the CBAM^{Carbon Border Adjustment Mechanism}, and in the United States, the CCA^{Clean Competition Act}, dubbed the "American Carbon Economy," is being promoted.

To achieve Net-Zero, the world is pushing for a coal phase-out. Coal is a major source of greenhouse gas emissions and has significantly contributed to climate change. In 2018, the IPCC highlighted the need for net-zero for the first time in its special report on 'Global Warming of 1.5°C' and recommended that the world cease coal-fired power generation.

The trend of coal phase-out is driving a parallel trend in coal phase-out finance, which is expanding into both coal mining and coal-fired power generation.

This means divesting from coal-related businesses.

Moreover, we are reducing investments not only in coal but also in fossil fuels in general, while actively supporting decarbonization and Net-Zero industries.

According to a survey by the KoSIF, Korean financial institutions held KRW 332 Tr. in fossil fuel finance as of the end of the first half of 2023. This is a massive amount, exceeding the total assets of KDB Bank, the largest public bank in Korea, which were KRW 319 Tr. at the end of 2023.

As decarbonization trade barriers become more stringent, investment in fossil fuels poses not only a financial risk for financial institutions but also a significant risk of hindering Korean industries' adaptation to decarbonization. To mitigate financial risks caused by climate change, a substantial reduction in fossil fuel finance is necessary.

It is time for the Korean government and the National Assembly to take action to encourage financial institutions to participate more actively in addressing the climate crisis. We hope that this year's publication of the Fossil Fuel Finance White Paper will be a valuable resource for examining the current state of fossil fuel finance, meeting the demands of the international community, understanding the role of finance for future generations, and establishing policies that meet these needs.

We express our sincere gratitude to the KoSIF for their hard work and support in publishing the white paper. We will continue to collaborate to create a sustainable Earth and respond to the climate crisis.

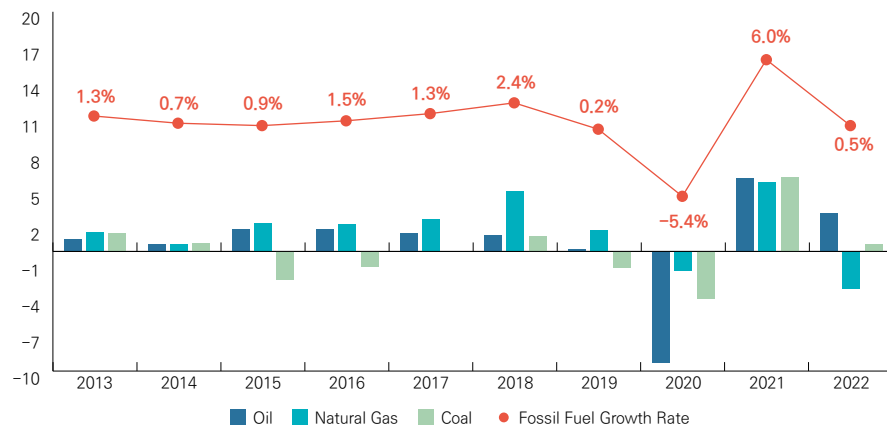
Understanding the Fossil Fuel Industry

Understanding the Fossil Fuel Industry

WMO^{World Meteorological Organization} report predicts that the period from 2023 to 2027 will be one of the five hottest on record. Environmental experts emphasize the urgent need to reduce GHG emissions. However, global fossil fuel consumption continues to rise. UN Secretary-General António Guterres stressed this point, stating, “We cannot solve the climate disaster without addressing its root cause: fossil fuel dependence.”

Fossil Fuel Consumption Trends

Graph 1 Global Fossil Fuel Consumption Growth Trends



(Source: Korea Energy Economics Institute Data)

According to the BP World Energy Statistics Report, global primary energy consumption in 2022 grew by 1.1% year-on-year. Although it slowed down from the annual growth rate of 6.0% in 2021, it recorded high growth rates of 4.0% and 2.8% compared to the 2018 and 2019. Fossil fuel consumption also increased by 0.5% in 2022 year-on-year. This is despite a 3.1% decline in natural gas consumption, as oil and coal consumption grew by 3.3% and 0.6%, respectively.

In 2022, fossil fuels accounted for 82%(2021: 82%)¹ of global energy demand, maintaining their dominance as the primary energy source. Although renewable energy increased by 13% due to Net-Zero policies worldwide, its share of total energy consumption was only 7.5%. This continued reliance on fossil fuels is likely due to record-high global energy consumption driven by industrialization in regions like China and India, with fossil fuels meeting this increased demand. Notably, coal consumption increased despite the global trend of coal phase-out. This is because some countries and companies opted for relatively cheap coal to meet energy demands amidst tight natural gas supplies and high prices. This rise in coal consumption, particularly in some EU countries, has drawn criticism for contradicting climate action.

In 2022, Korean primary energy consumption recorded a growth rate of 1.2%, similar to the global market. However, fossil fuel consumption decreased by 1.0%. By fuel type, oil consumption grew slightly by 1.3%, while natural gas and coal consumption decreased by 0.8% and 5.3%, respectively. This appears to be mainly due to a decrease in power generation energy consumption caused by the economic recession and an increase in the proportion of nuclear and renewable energy sources. However, the proportion of fossil fuels in energy consumption remains high at 83% (down from 85% in 2021).¹

Global fossil fuel consumption is expected to continue to grow for some time, driven by increasing energy consumption in developing countries. According to the EIA^{Energy Information Administration} report², global oil demand is expected to grow by 1.9% in 2023 and 1.3% in 2024 and coal consumption is

¹ BP Statistical Review of World Energy 2022

² EIA(US Energy Information Administration), “Short-Term Energy Outlook February 2024”

expected to increase by 1.4% in 2023, then decline from 2024, and decrease by 2.3% compared to 2023 by 2026.

In Korea, fossil fuel consumption, which appeared to decrease in 2023 (–3.3% as of October 2023), is projected to rebound in 2024 as energy demand rises, driven by economic growth recovery and led by natural gas (oil and natural gas: up 1.7% and 5.4%, respectively). However, coal consumption is expected to fall by 2.3% due to decreased demand in the power generation sector caused by a lack of transmission lines.³

According to the IPCC's 6th report, the global surface temperature has increased by 1.1°C from 1850–1900 (2011–2020 baseline), and if the average temperature rises by more than 1.5°C, extreme heat waves will occur 8.6 times more frequently than in the pre-industrial era. Furthermore, the IPCC emphasizes that to maintain the 1.5°C target in the long term, GHG emissions must be reduced by 43% by 2030 and 99% by 2050 compared to 2019 levels. The IRENA^{International Renewable Energy Agency} projects that the share of fossil fuels in global final energy consumption needs to be reduced as 12% by 2050 to achieve the 1.5°C target. However, current fossil fuel consumption trends run counter to this goal, posing a serious threat to the climate target of the Paris Agreement.

Amid recent developments in the fossil fuel market, some global asset management companies trying to find new business opportunities that generate profits are shifting away from Net-Zero and ESG principles. Reports from COP28 indicate that financial institutions and some investors are prioritizing profit motives and will only participate in the green transition if it yields attractive returns. As confirmed in this report, even though Korean financial institutions have declared coal phase-out and Net-Zero, the scale of fossil fuel finance is not decreasing.

Despite ongoing warnings about the declining future value of fossil fuels, these actions by financial institutions reflect the industry's continued pursuit of short-term profits, jeopardizing both the climate and the long-term sustainability of these institutions.

From the perspective of an investor with fiduciary responsibility, seeking attractive returns is a natural inclination. However, investing in assets with high short-term returns but significant long-term risks is unreasonable for long-term funds like pension or insurance. The reason such investments are made is because the timing of the return is aligned with the incentives of asset managers. Financial authorities need to address this misalignment and consider appropriate supervisory policies. Furthermore, it is crucial to establish a system that promotes rational investment decisions. This includes transparently disclosing the structure and risk factors of investment products, ensuring investors fully understand the risks and potential return fluctuations. Strengthening risk warnings for investment products with high future risk factors and enhancing regulation and supervision are also necessary.

Financial institutions also need to focus not on short-term profits but on investing in sustainable energy and technology through the flow of funds, providing financial incentives for eco-friendly projects and companies, and helping investors make responsible investments by providing various information. In addition, to induce the inflow of such mid to long-term funds, the role of public banks such as the IBK^{Industrial Bank of Korea} will be important. The IBK can provide various risk-hedging systems such as market trend analysis, investment product development and support, derivatives utilization, and technical support.

According to the WEO^{World Energy Outlook} 2023 report by the IEA^{International Energy Agency}, three scenarios (STEPS⁴, APS⁵, NZE⁶) all predict that fossil fuel consumption will peak in 2030 and then start to decline. This will lead to a decline in the value of fossil fuel assets and pose a significant financial risk to financial institutions. Therefore, in terms of future financial risk management, financial institutions should establish mid to long-term fossil fuel investment and management policies, and financial regulatory authorities should also actively consider climate risk in prudential assessment of financial institutions and make more specific and proactive efforts, such as advancing mandatory climate disclosure in financial markets.

3 KEEI^{Korea Energy Economics Institute}

4 STEPs(State Policies Scenario):
Based on policy

5 APS(Announced Pledges Scenario):
Based on government climate
commitments and Net-Zero targets

6 NZE Scenario
(Net-Zero Emissions by 2050 Scenario):
Presented a viable pathway
to achieving Net-Zero carbon
emissions in the global energy
sector by 2050.

Fossil Fuel Finance of Korean Financial Institutions

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- 1 Comprehensive Analysis of Fossil Fuel Finance
 - 2 Comprehensive Analysis of Coal Fuel Finance
 - 3 Comprehensive Analysis of Oil and Natural Gas Finance
 - 4 Comprehensive Analysis of Korean Natural Gas Finance

Fossil Fuel Finance of Korean Financial Institutions

1. Comprehensive Analysis of Fossil Fuel Finance

KRW 331.5 Trillion

(Including a total of KRW 138.1 Trillion won in insured amount)

Fossil fuel finance balance of Korean financial institutions (As of the End of June 2023)

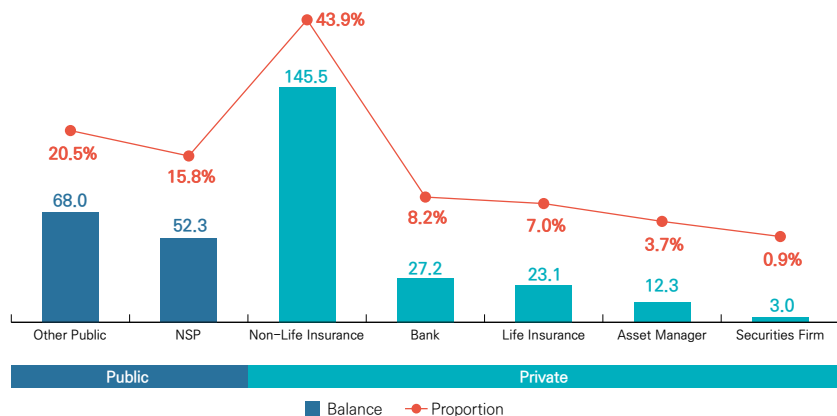
*Balance of the National Pension is as of the end of May 2023

The survey reveals that the fossil fuel finance scale of Korean financial institutions(both public and private) is estimated at KRW 331.5 Tr. in fossil fuels(corporate bonds, corporate loans, PF, equity investment, and insured amount¹) as of the end of the first half of 2023. This figure surpasses the total assets of KDB^{Korea Development Bank}, the largest public bank in Korea, which stood at KRW 319.3 Tr. at the end of 2023. Excluding insured amount, fossil fuel finance amounts to KRW 193.4 Tr., showing continuous growth over the past few years. Amid growing concerns about the future value of fossil fuels, financial institutions need to thoroughly manage their fossil fuel finance to prepare for financial risks associated with climate change.

Fossil Fuel Finance by Financial Sector(Including Insured Amount)

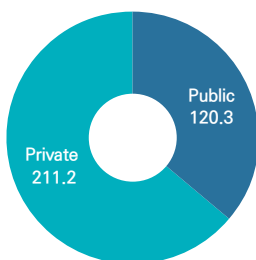
Graph 1 Fossil Fuel Finance Balance and Proportion by Financial Sector (including Insurance) (As of the End of June 2023)

Unit: KRW Trillion



Fossil Fuel Finance Balance by Financial Sector (including Insurance)

Unit: KRW Trillion



According to the analysis of the questionnaire responded to by 130 Korean financial institutions, the total fossil fuel finance balance in the Korean public and private finance sectors was calculated to be KRW 331.5 Tr.(KRW 138.1 Tr. including insured amount) as of June 2023.

By sector, the size of the private finance sector was KRW 211.2 Tr., accounting for 63.7% of total fossil fuel finance, surpassing the balance of the public finance sector at KRW 120.3 Tr.(36.3%). This is due to the large amount of insured amount(KRW 134.0 Tr.) held by private non-life insurance through insurance provision, which amounts to 63% of total private sector fossil fuel finance.

By fuel², the scale shows that natural gas and oil finance accounted for KRW 197.8 Tr.(59.7%), while coal finance accounted for KRW 133.8 Tr.(40.3%), showing that the proportion of oil and natural gas was larger.

Insured amount is insurance payments made to mitigate potential future losses, and thus differ in nature from other financial products that involve actual capital investment. Therefore, the detailed analysis of fossil fuel finance by sector will deal with the size of fossil fuel finance products excluding insured amount, and below, we will examine the insured amount, which accounts for the largest proportion of private sector fossil fuel finance.

- 1 Refers to the insured amount determined at the time the policyholder enters into an insurance contract with the insurance company
- 2 In some questionnaire responses submitted by financial institutions, the oil and natural gas finance sectors were not categorized separately, so the two fuels were analyzed together

Insured Amount KRW 134 Trillion

(50% of Total Assets)

As of the End of June 2023

Insured Amount(Insurance)³

The insured amount provided by Korean insurers to fossil fuel power plants, mining, refining and other industries that use fossil fuels as raw materials was KRW 134.0 Tr. as of June 2023. By fuel, it is evenly distributed across oil(37.4%), natural gas(32.1%), and coal(30.6%).

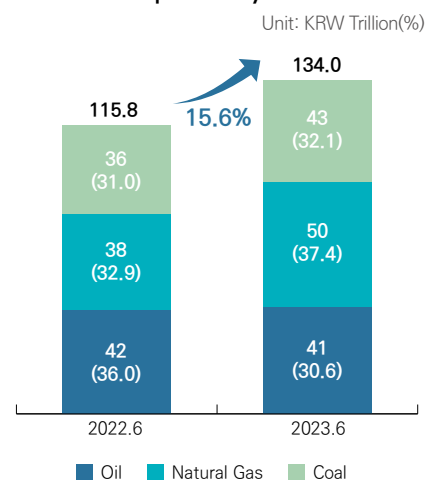
Insured amount for fossil fuel-related projects increased by 15.6% in the first half of 2023 compared year on year. This growth was primarily driven by the oil and natural gas sectors, which increased by 31.2% and 19.5%, respectively.

The increase in the oil sector is attributed to the rise in operational insurance accompanied by the expansion of refining facilities by Korean and international oil refining companies. In the natural gas sector, the expansion of LNG power plants is cited as the cause, driven by the construction of new LNG power plants and the conversion of aging coal-fired power plants to LNG, as announced in the '9th and 10th Basic Plan for Electricity Supply and Demand'.

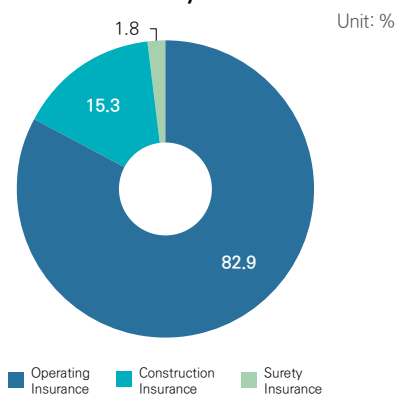
While the coal sector showed a 1.9% decline, the decrease is slight considering that most major non-life insurers have already declared coal divestment. This is likely because most non-life insurers' Coal Phase-out declarations are limited to restricting investments in new projects. By product type, operational insurance accounts for the largest share of insured amount at KRW 111.1 Tr.(82.9% of the total). This is broken down by fuel type as follows: oil(41.0%), coal(30.5%), and natural gas(28.5%). Construction insurance and surety insurance represent smaller portions at 15.3% and 1.8%, respectively.

The top three sectors in terms of insured amount are power generation(KRW 71.7 Tr., 53.5% of the total insured amount), refinery(KRW 32.8 Tr., 24.5%), and ship finance(KRW 11.6 Tr., 8.7%). In the power generation sector, which holds the highest share, the insured amount provided to the coal sector was the largest at KRW 41.0 Tr.(57.1%), all of which consisted of construction insurance (KRW 6.7 Tr.) and operational insurance(KRW 33.9 Tr.) related to coal-fired power plants. In the coal sector, construction insurance for the Samcheok Coal-fired Power Plant, the last coal power plant under construction in Korea, accounts for more than 70% of the total(KRW 4.7 Tr.). As of June 2023, 99% of this construction insurance is set to expire and terminate in 2024. The next largest sector, refinery, which is entirely part of the oil sector, consists of insured amount related to the construction and operation of refining facilities.

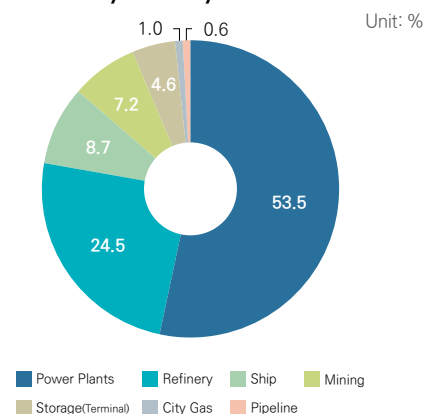
Graph 2 Insured Amount and Proportion by Fuel



Graph 3 Proportion of the Insured Amount by Product



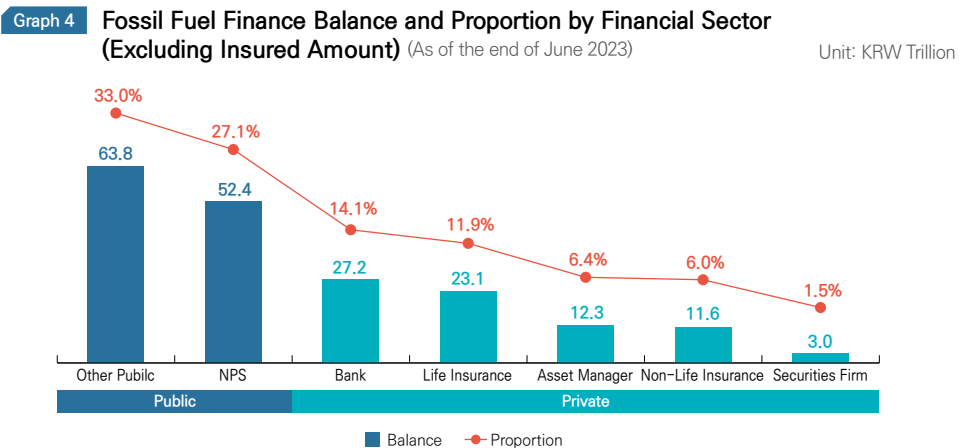
Graph 4 Proportion of Insured Amount by Industry



³ This white paper analyzes the insured amount of 10 Korean private non-life insurance companies that responded to the questionnaire, as of the end of June 2023

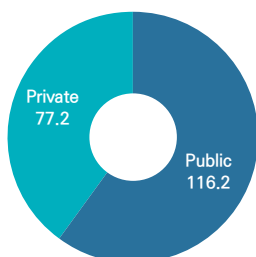
Total insured amount for fossil fuel-related assets held by non-life insurance companies stands at KRW 134 Tr., representing 50% of their total assets(KRW 268 Tr.) as of June 2023.⁴ While not a direct investment, this significant exposure could pose a substantial financial burden for non-life insurers if losses occur in the future. Continued underwriting in the fossil fuel industry, a sector facing climate-related risks and potential phase-out, represents a financial risk for non-life insurance companies. To mitigate these risks and contribute to climate change mitigation, insurers should proactively establish and implement internal policies to manage fossil fuel underwriting and actively monitor the companies they insure.

Fossil Fuel Finance(Excluding Insured Amount)



As of June 2023, the size of fossil fuel finance by Korean financial institutions, excluding insured amount, is KRW 193.4 Tr. The public finance sector's fossil fuel finance amounts to KRW 116.2 Tr.(60.1%), which is larger than the private sector's KRW 77.2 Tr.(39.9%) after excluding insured amount. This is attributed to the large-scale fossil fuel finance held by the NPS and KDB, which account for 60% of the total public sector fossil fuel finance.(NPS assets: KRW 52.4 Tr. and KDB's 33% stake in KEPCO^{Korea Electric Power Corporation}: KRW 16.9 Tr.)

Fossil Fuel Finance Balance by Financial Sector (Excluding Insured Amount)
Unit: KRW Trillion



Public Finance Sector Fossil Fuel Finance

As of the end of June 2023, the public finance sector's fossil fuel finance amounted to a total of KRW 116.2 Tr.(excluding insured amount). By fuel type, this is composed of KRW 47.6 Tr. in coal finance (41.0% of the public finance sector) and KRW 68.5 Tr. in oil and natural gas finance(59.0%)

Regarding coal finance, the majority is comprised of assets related to KEPCO held by the NPS and KDB, totaling KRW 35.2 Tr.. This includes KDB and the NPS's stakes in KEPCO(KRW 16.9 Tr. and KRW 0.8 Tr., respectively), and the NPS's bonds of KEPCO and its subsidiaries(KRW 17.5 Tr.). This amount accounts for 73.9% of coal finance and 30.3% of the total fossil fuel finance in the public finance sector. Notably, in the case of the NPS, due to KEPCO's continuous operating losses, the scale of investment in KEPCO bonds has steadily increased from KRW 12.0 Tr. based on the 2021 balance to KRW 16.8 Tr. in 2022 and KRW 17.5 Tr. in June 2023.

Oil and natural gas finance in the public finance sector totals KRW 68.5 Tr.(59.0%), surpassing the scale of coal finance. Of this, the NPS holds the largest share with a total of KRW 29.1 Tr.(42.2%) in bonds and stocks of Korean and global refining, mining, and power generation companies. This is followed by the KEXIM^{Korea Eximbank} and KDB with KRW 20.1 Tr. and KRW 7.6 Tr. respectively, in PF, corporate loans, and ship finance.

Private Finance Sector Fossil Fuel Finance

In the private finance sector, total fossil fuel finance is KRW 77.2 Tr. as of June 2023. Coal finance comprises KRW 43.0 Tr.(55.6%) and oil and natural gas finance accounts for KRW 34.2 Tr.(44.4%).

⁴ Asset scale derived from the questionnaire responses of 10 non-life insurance companies

In the private sector, banks hold the largest amount at KRW 27.2 Tr.(35.3% of the private sector), followed by life insurance at KRW 23.1 Tr.(29.9%), asset manager at KRW 12.3 Tr.(16.0%), non-life insurance at KRW 11.6 Tr. (14.9%), and securities firms at KRW 3.0 Tr.(3.9%). As of the end of the first half of 2023, following the trend from the previous year, banks continue to maintain a large balance of investments in bonds of KEPCO and its subsidiaries(approximately KRW 26 Tr.) in the coal sector, resulting in the highest proportion of coal in their portfolios.

I Details of Fossil Fuel Finance by Fuel Type(Excluding Insured Amount)⁵

As of the end of June 2023, an analysis of Korean fossil fuel finance by fuel type (excluding insured amount) reveals that oil and natural gas account for a larger share at 53.2%(KRW 102.8 Tr.), compared to coal at 46.8%(KRW 90.6 Tr.). In the case of coal, there is no significant difference between the public finance sector at 52.6%(KRW 47.6 Tr.) and the private sector at 47.4%(KRW 43.0 Tr.). It is analyzed that investments in KEPCO's equity and bonds consistently account for a significant portion of both the public and private sectors.

In the case of natural gas and oil, the public sector holds a larger share of assets at 66.6%(KRW 68.5 Tr.), compared to the private sector at 33.4%(KRW 34.3 Tr.).In the oil and natural gas sector, the NPS holds the largest share of Korean and overseas oil and natural gas company bonds and equities(KRW 29.1 Tr.). This is followed by ship finance(LNG carriers, drilling vessels), PF, and corporate loans by KEXIM and KDB.

I Details of Fossil Fuel Finance by Industry(Excluding Insured Amount)

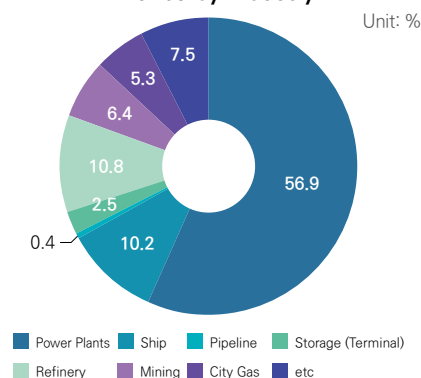
In Korean, the power generation industry receives the largest share of fossil fuel finance investment (56.9%, KRW 110.0 Tr.). This is followed by the refinery(10.8%, KRW 20.9 Tr.) and shipping(10.2%, KRW 19.8 Tr.) industries.

In the power generation industry, which accounts for the largest share, coal finance continues to represent over 78% in 2023, following the trend from the previous year, due to the ongoing impact of investments in KEPCO's equity and bonds. The next largest sector is refinery, recording KRW 20.9 Tr., mainly composed of bond/equity investments, PF, and corporate loans to crude oil refining companies. Notably, 76% of these assets are held by the public finance sector, including the NPS, the KEXIM, and KDB.

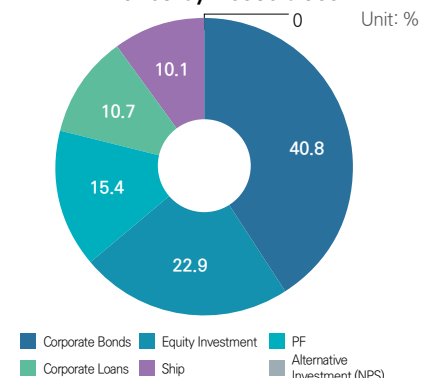
I Details of Fossil Fuel Finance by Asset Group(Excluding Insured Amount)

Looking at the fossil fuel finance balance by asset type, combining both public and private financial institutions, corporate bonds account for KRW 79.0 Tr.(40.8% of total fossil fuel finance), followed by equity investments at KRW 44.3 Tr.(22.9%), PF at KRW 29.8 Tr.(15.4%), and corporate loans at KRW 20.6 Tr.(10.7%). In the case of corporate bonds and equity investments, they account for more than half of the coal sector, at 63.1%(KRW 49.8 Tr.) and 52.1%(KRW 23.1 Tr.), respectively. This demonstrates that bonds and equity investments in KEPCO and its subsidiaries held by public and private financial institutions continue to constitute a significant portion of fossil fuel finance.

Graph 6 Proportion of Fossil Fuel Finance by Industry



Graph 7 Proportion of Fossil Fuel Finance by Asset Class



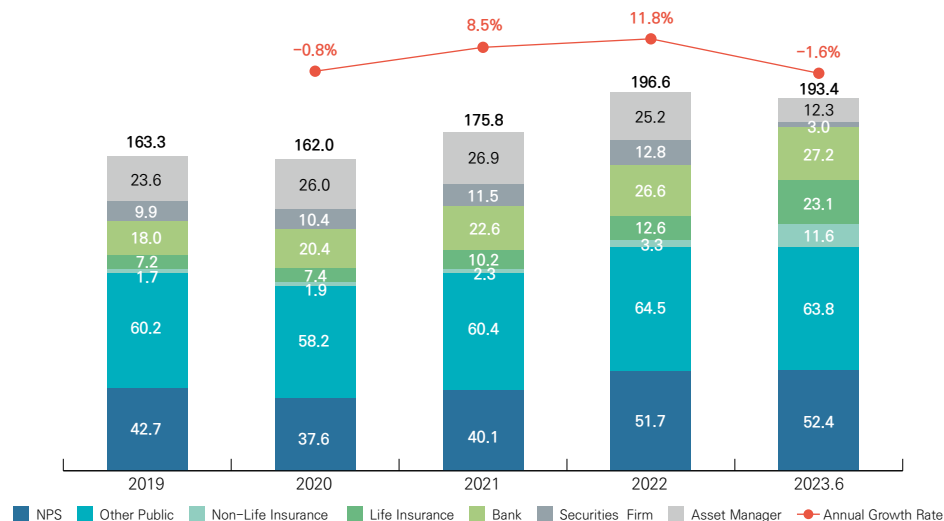
⁵ Since the financing for oil and natural gas was not separately classified in the response questionnaires of some financial institutions, the scale of financing for oil and natural gas was integrated during analysis.

Trends in Fossil Fuel Finance Balance by Period(Excluding Insured Amount)

Graph 8 Trends in Fossil Fuel Finance Balance by Period(Excluding Insured Amount)

(As of the End of June 2023)

Unit: KRW Trillion



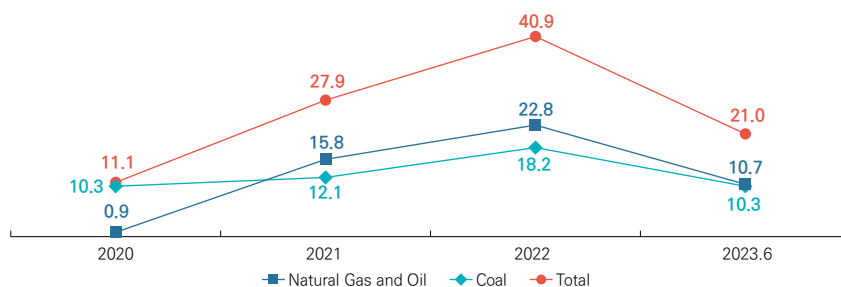
The graph above illustrates the trend in fossil fuel finance balances over the past five years. As shown, following a period of stagnation in 2020, fossil fuel finance experienced significant growth, rising by 8.5%(KRW 13.8 Tr.) in 2021 and 11.8%(KRW 20.8 Tr.) in 2022. In 2022, this KRW 20.8 Tr. increase was driven by both public and private sector growth, with the public sector contributing KRW 13.9 Tr. and the private sector KRW 6.9 Tr.. Notably, over 70% of the public sector increase (KRW 9.8 Tr., including KRW 4.8 Tr. increase in KEPCO bonds) stemmed from the NPS's increased fossil fuel asset holdings. Within the private sector, the rise was primarily attributed to banks(KRW 4.0 Tr.) and life insurance(KRW 2.4 Tr.), largely in the form of bonds, PF, and loans.

Annual new execution amount in fossil fuels is also on an upward trajectory, climbing from KRW 11.1 Tr. in 2020 to KRW 40.9 Tr. in 2022. In particular, the amount of new fossil fuel finance in 2022 significantly increased(natural gas and oil: KRW 22.8 Tr., coal: KRW18.2 Tr.). This is analyzed to be due to the increase in demand for funds driven by companies' need for operating funds and facility investment expansion, caused by factors such as soaring energy prices and exchange rate hikes. In the coal sector in particular, the withdrawal of funds from previously committed contracts signed before the coal phase-out declaration continues, resulting in a persistently high level of new execution amount.⁶

The outstanding balance of fossil fuel finance at the end of the first half of 2023 appeared to have slightly decreased to KRW193.4 Tr. compared to the end of 2022. However, this balance reflects the new financing of KRW 21.0 Tr. executed during the first half of the year, i.e., six months. If this amount is simply annualized(KRW 42 Tr.), it exceeds the KRW 40.9 Tr. executed throughout 2022. Therefore, based on the scale of new financing, the fossil fuel finance is expected to increase by the end of 2023.

Graph 9 New Investment in Fossil Fuel Finance by Year(Excluding Insured Amount)

Unit: KRW Trillion



⁶ The scope of coal phase-out declarations by Korean financial institutions has been limited to the suspension of financial support for new projects. It has been confirmed that projects with pre-existing commitments made prior to the coal phase-out declarations are still disbursing funds as scheduled. This report includes these amounts as part of the annual new disbursements for analysis.

2. Comprehensive Analysis of Coal Finance

59

Number of Coal Power Plants in Operation in 2024

188 TWh

Coal Power Generation in 2023

32 %

Korean Coal Power Generation Ratio in 2023

I Current Status of Korean Coal Industry

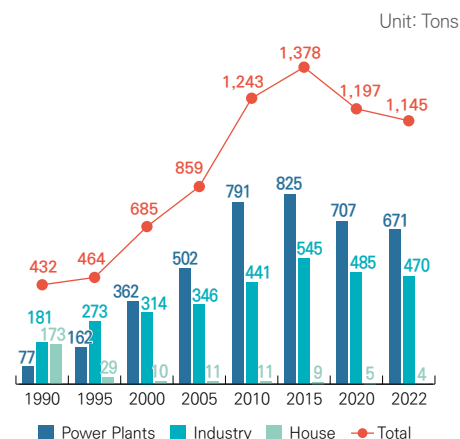
Beginning with the Pyeongyang Mining Center in 1903, the development of modern coal mines began, and coal served as one of the primary energy sources responsible for powering Korean industries and households. Korean coal production increased every year, peaking at 24 million tons in 1988, before declining sharply to approximately 820,000 tons as of 2022, marking a 96.6% decrease.

While Korean coal production has significantly decreased, consumption has steadily increased. Total consumption, combining production and imports, amounted to 45 million tons in 1990 and has steadily increased to a staggering 150 million tons as of 2022. Of this, 58% is used for power generation.

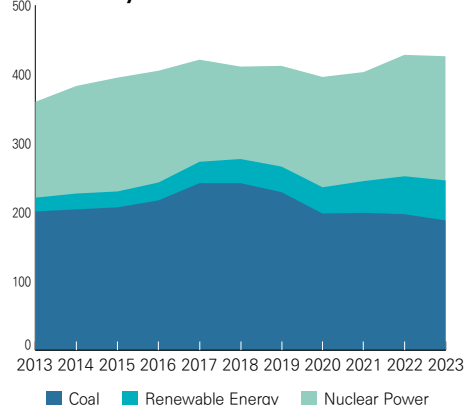
As of 2023, coal accounts for 32% of Korean energy generation, representing the largest share among energy sources, with most of it being produced by power plants owned by KEPCO's power generation subsidiaries.

The support of Korean coal finance is primarily allocated to investments in coal-fired power projects or companies engaged in power generation, with relatively smaller amounts allocated to mining or distribution businesses. Financial support for the coal industry can be categorized into four types: PF, corporate bonds, corporate loans, and insurance underwriting. PF involves providing loans for coal-fired power plant construction projects. With the suspension of permits for new Korean coal power plants, no new PF contracts have been reported since 2020. Corporate bond refers to the acquisition of corporate bonds issued by power generation companies, special purpose entities for coal-fired power generation, or companies engaged in related businesses. Corporate loans and equity investments similarly represent investments in companies involved in coal-related businesses through loans or equity acquisitions. Insurance support involves providing insurance products for coal construction or operation. 88% of the total insured support amount pertains to construction and operating insurance for Korean coal-fired power plants.

Graph 1 Coal Usage by Industry¹



Graph 2 Trend of Coal, Nuclear Power, Renewable Energy Generation by Year²



¹ Korea Energy Economics Institute (KEEI), "2023 Energy Statistics Year Report", processed by KoSIF.

² Korea Electric Power Corporation (KEPCO), "2402_Electricity Statistics Monthly Report (No. 544)", processed by KoSIF

KRW 91 Trillion

(KRW 134 Trillion Including Insured Amount)

Korean Financial Institutions
Coal Exposure
(As of the End of June 2023)

Coal Finance by Type

55% of the outstanding balance of coal finance by Korean financial institutions, amounting to KRW 49.8 Tr., is in the form of corporate bonds. Of these corporate bonds, 94%(KRW 47 Tr.) are related to KEPCO and its subsidiaries. KEPCO's power generation companies, which directly operate in the power generation sector, account for KRW 11.5 Tr..

Following corporate bonds, equity investment accounts for 26% with an outstanding balance of KRW 23 Tr. Of this, KRW 17.7 Tr. represents investments in KEPCO's equity. Including institutions that did not disclose detailed equity investment information, the amount of equity investment in KEPCO is expected to be even larger.

In the case of PF, out of the total KRW 13 Tr., KRW 8.5 Tr. was invested in the Goseong Power Plant, Gangneung Power Plant, and Samcheok Power Plant, which are scheduled to operate beyond 2050.

Public Finance Sector Coal Finance

While the outstanding balance of coal investments by public and private financial institutions is similar, private institutions hold 67.9% of their coal investments in corporate bonds, accounting for more than two-thirds. Public institutions hold most of their coal investments in corporate bonds and equity investments, each accounting for 46.2% and 44.7%, respectively.

Of the KRW 22 Tr. in corporate bonds, KRW 20.6 Tr. is in bonds issued by KEPCO and its subsidiaries, with bonds from the subsidiaries accounting for KRW 2.6 Tr.. In terms of equity investments, KEPCO accounts for KRW 17.7 Tr. out of the total KRW 21.3 Tr.

The largest contributors to public financial institutions' coal exposure are the NPS with KRW 23.2 Tr. and KDB with KRW 17.9 Tr., with the combined exposure of these two institutions accounting for 86.4% of the total. Investments in KEPCO appear to have the most significant impact. Following these, Korea Post and the KEXIM hold the third and fourth positions with KRW 3.1 Tr. and KRW 2.8 Tr., respectively. K-SURE, the only public financial institution with an outstanding insured amount, reported an insured balance of KRW 2.2 Tr. for overseas coal-fired power projects.

Private Finance Sector Coal Finance

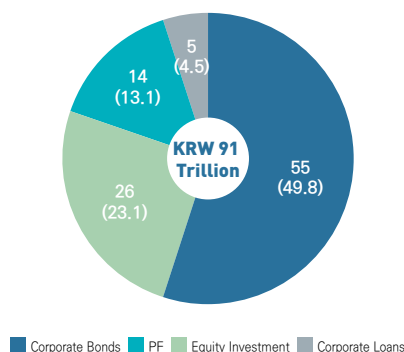
Corporate bonds exceed half of the total at 64.8%, followed by PF at 23.9% as the second-largest category. Corporate loans and equity investments together account for 11.4%. Out of the KRW 27.8 Tr. in corporate bonds, KEPCO accounts for KRW 17.4 Tr., and KEPCO's subsidiaries account for KRW 8.9 Tr.. Similar to public finance, bonds related to KEPCO and its subsidiaries comprise 94.6% of the outstanding balance of corporate bonds in private finance.

The PF investment amount for private finance is KRW 10.2 Tr., representing 78% of Korean power plant PF investments. Of this, KRW 8.4 Tr. is invested in Goseong Power Plant, Gangneung Power Plant, and Samcheok Power Plant.

Among private financial institutions, NACF^{National Agricultural Cooperative Federation} has the largest outstanding balance of coal investments at KRW 4.9 Tr., followed by Hanwha Asset Management at KRW 4.0 Tr. and Hana Bank at KRW 3.7 Tr.. In all three institutions, bonds of KEPCO and its subsidiaries account for the majority of their holdings. Following these, Hanwha Life Insurance and NH Bank reported large outstanding balances of KRW 3.6 Tr. and KRW 2.3 Tr., respectively. In terms of PF investments, Samsung Life Insurance and Kyobo Life Insurance reported the largest outstanding balances at KRW 1.3 Tr. and KRW 1.2 Tr., respectively.

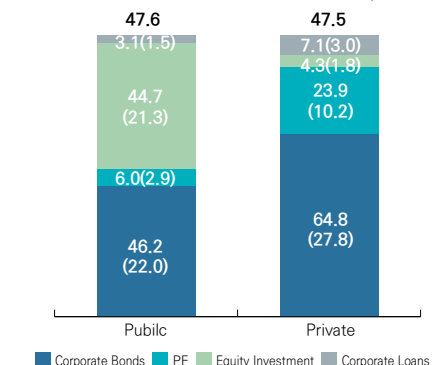
Graph 3 Coal Finance Balance by Type

Unit: % (KRW Trillion)



Graph 4 Coal Finance Balance by Sector

Unit: % (KRW Trillion)



The Past of Coal Investment

Financial institutions have declared their commitment to coal divestment, pledging to halt new coal finance. Many institutions, including prominent public pension funds like the NPS and the TP^{Teachers' Pension}, as well as the five major financial groups, have joined this movement. However, despite this trend towards coal divestment, the total outstanding balance of coal finance continues to increase. This is primarily due to the execution of committed amounts from existing contracts, indicating that current coal divestment declarations are insufficient to manage financial institutions' risks and reduce coal investments.

With the exception of corporate loans, the outstanding balances of PF, corporate bonds, and equity investments are all steadily increasing. In particular, corporate bonds have shown the most significant growth in 2022. This is likely due to the surge in KEPCO bond issuance in response to KEPCO's deficit caused by the rise in primary energy prices. The total amount of KEPCO bonds issued increased from KRW 3.5 Tr. in 2020 to KRW 10.4 Tr. in 2021 and KRW 27.9 Tr. in 2022.

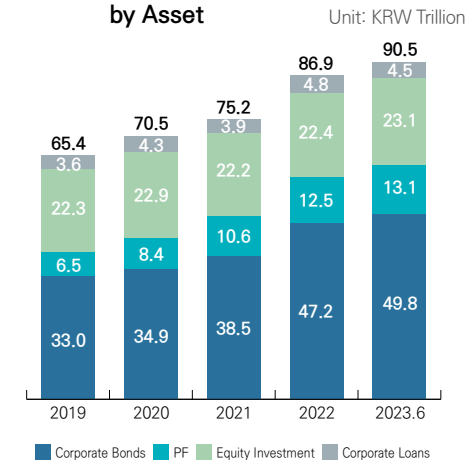
New PF investments in coal-fired power projects are consistently occurring within the range of KRW 2 to 3 Tr., leading to an increase in the outstanding balance. While the amount of new investment has been decreasing since 2021, there are still outstanding commitments from previous contracts, including those for the Samcheok Power Plant, which is currently under construction, and the Goseong Power Plant and Gangneung Power Plant, which recently commenced commercial operations. Consequently, a significant decrease in the outstanding balance is unlikely in the near future.

Although the outstanding balance of corporate loans decreased by KRW 0.3 Tr. in 2023 compared to 2022, the amount executed in the first half of 2023 is close to the total amount executed in both halves of the previous year. Therefore, considering the execution amount for the second half of the year, the outstanding balance at the end of 2023 is expected to increase again.

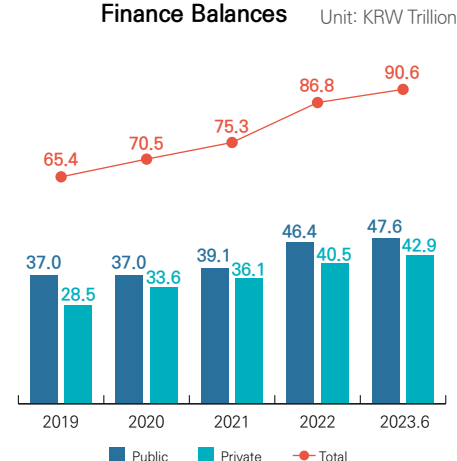
In the case of equity investments, new investments are continuously occurring, ranging from KRW 300~500 Bi. Similar to corporate loans, the amount executed in the first half of 2023 is comparable to the total amount executed in the previous year, indicating that the total investment amount for 2023 is likely to increase compared to the previous year.

Paradoxically, 2022 witnessed the highest amount of new coal investment ever recorded, despite being the year immediately following the year when the largest number of financial institutions declared coal phase-out. At this point, it seems necessary to seriously reconsider the meaning and effectiveness of coal divestment by financial institutions.

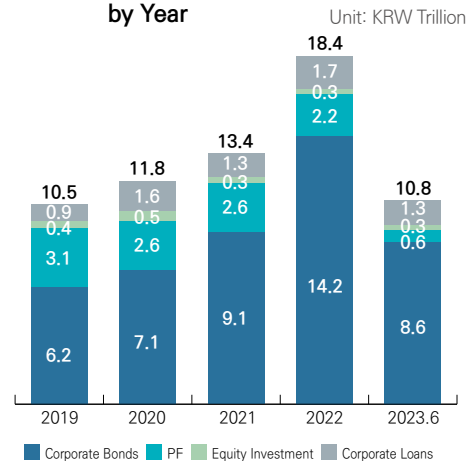
Graph 5 Trends in Coal Finance Balance by Asset



Graph 6 Trends in Public and Private Coal Finance Balances



Graph 7 New Investment in Coal Finance by Year



Future Exposure

〈Graph 8〉 below illustrates the projected balance flow based on the maturity schedules of corporate bonds and PF. While the graph indicates a decline in exposure, the actual rate of decrease is anticipated to be significantly slower when considering undrawn PF commitments and outstanding corporate bond commitments. This projection excludes equity investments, which have no fixed maturity, and corporate loans with uncertain maturity dates.

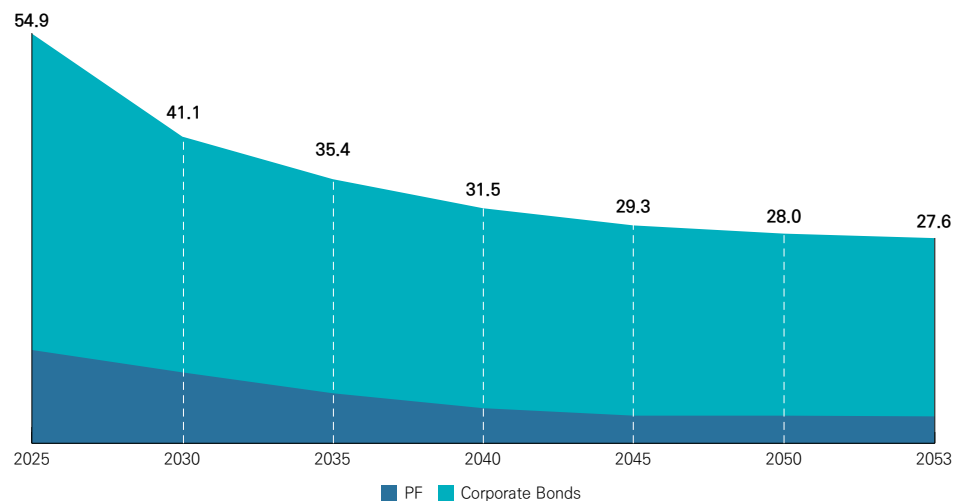
Currently, the combined outstanding balance for corporate bonds and PF is KRW 62.9 Tr.. This figure is projected to decrease to KRW 54.9 Tr. by 2025, then gradually decline to KRW 40 Tr. range in 2027 and KRW 30 Tr. range in 2031. By 2043, the balance is expected to fall to KRW 20 Tr. range and remain at that level through 2053. This projection deviates significantly from the IEA's scenario, which calls for advanced economies to phase out coal by 2030 and achieve global coal phase-out by 2040.

Given this trajectory, a rapid reduction in the risk associated with financial institutions' coal investments appears unlikely. Mitigating this risk necessitates either reducing the scale of coal-fired power generation investments or decreasing emissions from the portfolio companies themselves. For corporate bonds, risk reduction can be achieved by requiring bond issuing companies to actively manage their emissions. However, this approach is less effective for PF investments, as they are often directly tied to coal-fired power plants, making indirect management challenging.

Considering current PF investment trends, it is highly probable that additional loans will be needed to fulfill existing contracts with outstanding repayment obligations. Furthermore, with the anticipated decline in coal-generated electricity demand and the ongoing shift towards alternative energy sources, the long-term profitability of coal-fired power plants is uncertain. To ensure financial stability, it is crucial for financial institutions to implement measures that actively manage their remaining investments in power companies and coal-fired power plants.

Graph 8 The Flow of PF, Corporate Bond Exposure (Expected)¹

Unit: KRW Trillion



¹ Corporate bonds with unconfirmed maturity dates, PF, corporate loans and stocks are excluded

3. Comprehensive Analysis of Oil and Natural Gas Finance

KRW 197.8 Trillion

(Including KRW 94.9 Trillion of Insured Amount)

Natural Gas and Oil Finance Balance
(As of the End of June 2023)

By the end of June 2023, Korean financial institutions held a total of KRW 197.8 Tr. in natural gas and oil finance. This includes KRW 94.9 Tr. of insured amount and encompasses various forms of investment such as corporate bonds, equity investments, corporate loans, and PF. Natural gas and oil finance represents 58.9% of total fossil fuel finance, surpassing coal finance. Despite this significant investment, financial institutions lack specific policies for natural gas and oil. It is crucial that these institutions swiftly establish policies and risk management systems for both new and existing investments in fossil fuels to facilitate decarbonization efforts beyond coal phase-out.

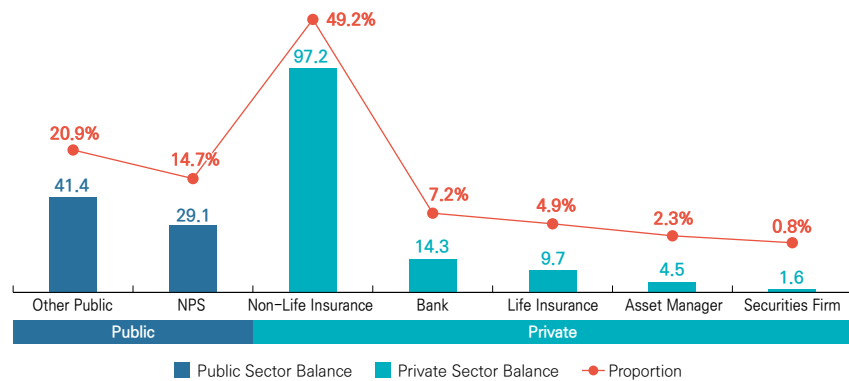
Details of Natural Gas and Oil Finance by Sector (Including and Excluding Insured Amount)

Natural Gas and Oil Finance(Including Insured Amount)

Graph 1 Balance and Proportion of Natural Gas and Oil Finance by Sector

(As of the End of June 2023)

Unit: KRW Trillion



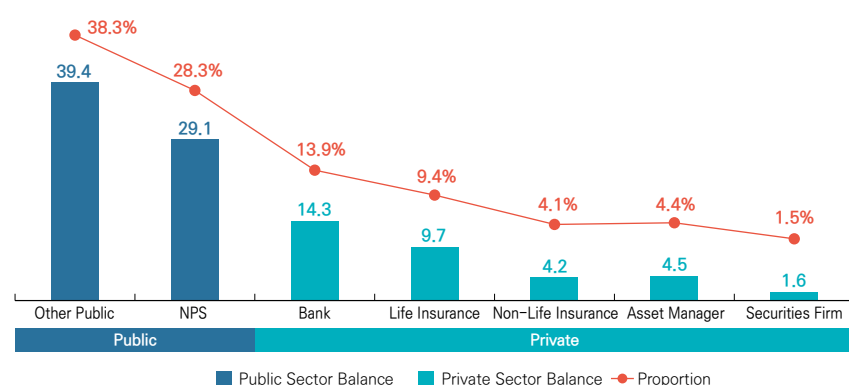
Korean financial institutions hold a combined KRW 197.8 Tr. in natural gas and oil finance(including insured amount). The private sector accounts for KRW 127.3 Tr.(64.4%) of this total, while the public sector holds KRW 70.5 Tr.(35.6%). The private sector's larger share is primarily driven by the significant insured amount(KRW 93.0 Tr.) of non-life insurance companies. This represents 96% of the total KRW 97.2 Tr. in natural gas and oil finance held by these companies and constitutes 73% of the private sector's total. Within the public sector, the NPS dominates with KRW 29.1 Tr. in holdings, representing 41.3% of the public sector's total and making it the largest single holder of these assets.

Natural Gas and Oil Finance(Excluding Insured Amount)

Graph 2 Balance and Proportion of Natural Gas and Oil Finance by Sector

(As of the End of June 2023)

Unit: KRW Trillion



Excluding the insured amount, Korean financial institutions held a total of KRW 102.8 Tr. in natural gas and oil finance as of the end of June 2023. In this case, the public sector holds the majority of assets(KRW 68.5 Tr., 66.6%), surpassing the private sector(KRW 34.3 Tr., 33.4%).

Public Finance Sector

Within the public sector's KRW 68.5 Tr. in natural gas and oil finance, KRW 39.4 Tr.(57.5%) is held by public institutions other than the NPS. The remaining KRW 29.1 Tr.(42.5%) is held by the NPS. Over 70% of the holdings of these other public institutions consist of assets like ship finance, corporate loans, and PF held by the KEXIM(KRW 20.1 Tr.) and KDB(KRW 7.6 Tr.). The NPS holds the largest amount of natural gas and coal finance assets among individual institutions, with 60% of its holdings in equity stakes and 30% in bonds.

Private Finance Sector

The private sector holds KRW 34.3 Tr. in natural gas and oil finance. This is distributed across various types of institutions: banks(KRW 14.3 Tr., 41.7%), life insurance(KRW 9.7 Tr., 28.2%), asset manager(KRW 4.5 Tr., 13.1%), non-life insurance(KRW 4.2 Tr., 12.3%), and securities firm(KRW 1.6 Tr., 4.6%). bank, which holds the largest share, primarily invest in corporate loans and PF(over 50% of their holdings), followed by corporate bonds. Life insurance, the second largest holder, also predominantly invests in corporate bonds and corporate loans.

Natural Gas and Oil Finance Details by Industry

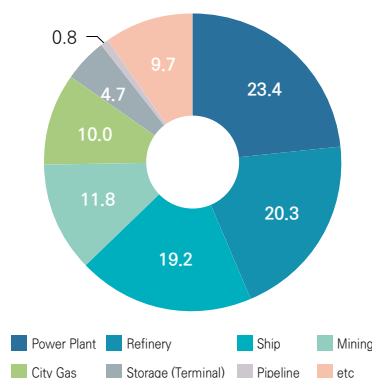
Power plant leads investment in natural gas and oil finance, representing 23.4%(KRW 24.1 Tr.) of total assets. This is consistent with trends in fossil fuel finance overall. Following power plant, the refining industry accounts for 20.3%(KRW 20.9 Tr.), the shipping industry for 19.2%(KRW 19.8 Tr.), mining for 11.8%(KRW 12.1 Tr.), and city gas for 10.0%(KRW 10.2 Tr.).

Natural Gas and Oil Finance Details by Asset

An analysis of natural gas and oil finance by asset reveals that corporate bonds comprise the largest share at KRW 29.2 Tr.(28.2%), followed by equity investment at KRW 21.8 Tr.(21.1%), ship finance at KRW 19.5 Tr.(18.9%), PF at KRW 16.7 Tr.(16.2%), and corporate loans at KRW 16.1 Tr.(15.6%). Alternative investments represent a negligible 0.1%(KRW 0.1 Tr.). Notably, the NPS holds the majority of both corporate bonds(38.6%) and equity investments(83.2%).

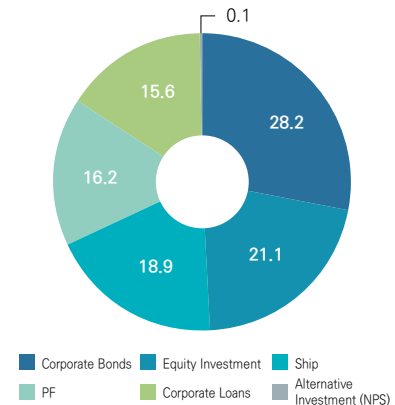
**Graph 3 Proportion by Industry
(Excluding Insured Amount)**
(As of the End of June 2023)

Unit: %



**Graph 4 Proportion by Asset
(Excluding Insured Amount)**
(As of the End of June 2023)

Unit: %



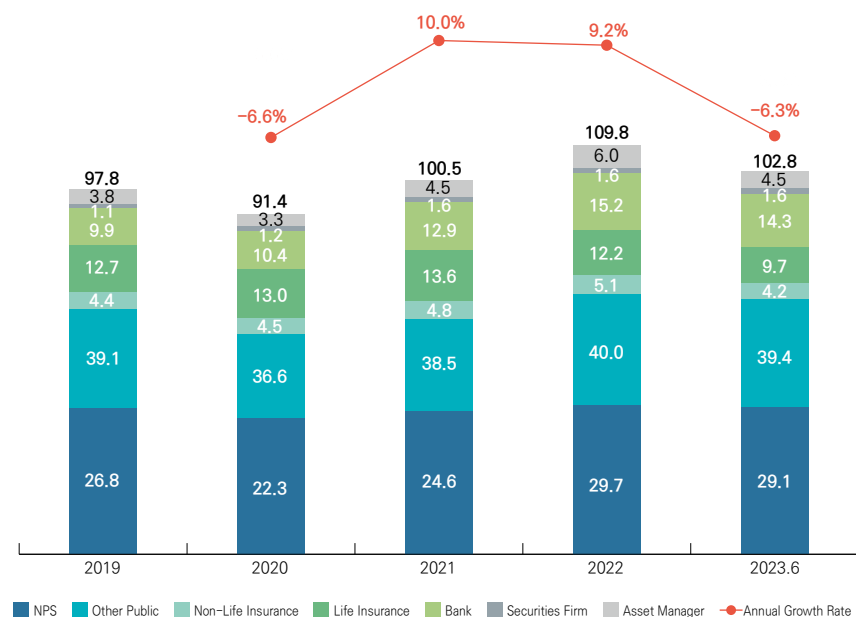
Trends in Oil and Natural Gas Finance Balances by Period

Excluding insured amounts, the natural gas and oil finance balance of Korean financial institutions showed a significant upward trend in 2021 and 2022, but decreased by 6.3% at the end of the first half of 2023. In the public finance sector, which holds 66.6% of the total balance, the growth of the NPS (growth rate: 10.3% in 2021, 20.9% in 2022) is notable. In the private finance sector, the balance of the banking sector increased by 24.4% in 2021 and 17.8% in 2022, leading the growth of the entire private finance sector. This growth was mainly observed in PF and corporate loans, reflecting the increase in demand for operating and facility investment funds from companies.

The balance at the end of the first half of 2023 appears to be somewhat declining compared to the end of 2022. However, the new execution amount of natural gas and oil finance was investigated to be KRW 11 Tr. during the first half of 2023, and if this is simply converted to an annual amount (KRW 22 Tr.), the balance in 2023 will increase to KRW 113.8 Tr.. Therefore, it is difficult to say that the balance of natural gas and oil finance has decreased. In fact, the new execution amount for the first half of 2023, converted to an annual amount, is not significantly different from the new execution amount of KRW 23 Tr. in 2022, and has even increased compared to 2021.

Graph 5 Trends in Natural Gas and Oil Finance Balances by Period (Excluding Insured Amount) (As of the End of June 2023)

Unit: KRW Trillion



4. Comprehensive Analysis of Korean Natural Gas Finance

KRW 68.7 Trillion

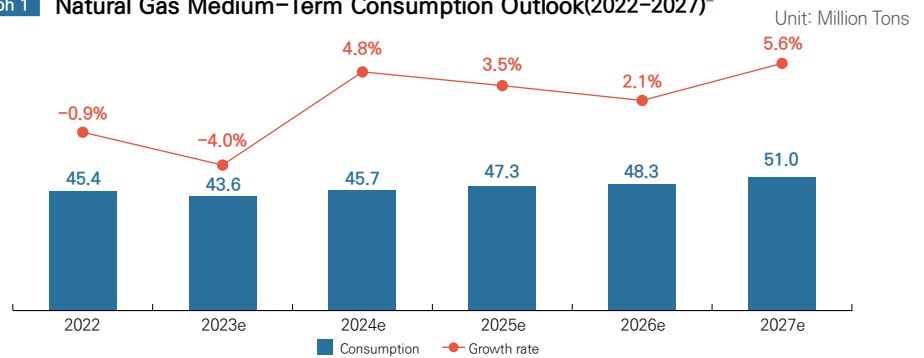
Korean Financial Institutions' Project Scale of Korean Natural Gas
(Based on Balance at the End of June 2023)

Since its first supply in 1986, natural gas in Korea has become a crucial energy source across various sectors, including cogeneration, heating and cooling, city gas, vehicle fuel, and other industries. As of November 2023, it accounts for 19%¹ of Korean primary energy supply. With the recent emphasis on natural gas as a bridging fuel for the transition to Net-Zero, the scale of Korean natural gas finance by financial institutions has been steadily increasing.

Korean Natural Gas Demand

The growth of natural gas demand in Korea slowed temporarily in the early 2000s after the expansion of city gas was completed. However, due to increased demand in the power generation sector since 2016, it recorded an average growth rate of 1.7% from 2014 to 2022. Demand for natural gas briefly stagnated between 2022 and 2023 due to soaring prices and supply issues caused by the Russia-Ukraine War, coupled with an economic downturn. However, consumption is expected to increase somewhat after 2024 as demand for natural gas grows as a transition fuel for carbon neutrality, including the conversion of coal-fired power plants to natural gas.

Graph 1 Natural Gas Medium-Term Consumption Outlook(2022-2027)²



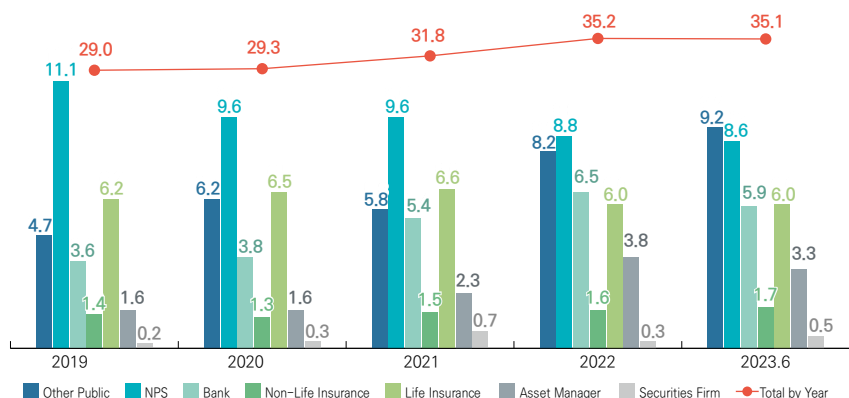
Details of Korean Natural Gas Finance by Sector (Including and Excluding Insured Amount)

The total amount of natural gas finance invested by Korean financial institutions in Korean natural gas projects was KRW 68.7 Tr. at the end of the first half of 2023 (including KRW 33.6 Tr. in insured amount). The insured amount accounts for nearly half of the total natural gas finance, of which 74.9% is provided to the power generation industry namely the construction or operation of LNG power plants. Following the power generation industry, the industries with the largest proportion are ship (LNG drilling rigs, 14.1%), storage (terminals, 6.9%), and city gas (4.1%).

Graph 2 Trends in Natural Gas Finance Balance by Year (Excluding Insured Amount)

(As of the End of June 2023)

Unit: KRW Trillion



1 Energy Statistics Monthly Report 2024.02

2 Graph Based on Processed National Energy Statistics Data

Excluding insured amount, the total amount of Korean natural gas finance is KRW 35.1 Tr., continuing its steady growth rate over the past few years (based on the end-of-period balance: 1.1% in 2020, 8.4% in 2021, and 10.9% in 2022). The new investment of natural gas finance by year has also been steadily increasing (2020: KRW 6.3 Tr., 2021: KRW 10.6 Tr., 2022: KRW 13.1 Tr.). In the first half of 2023, a new investment of KRW 5.7 Tr. was recorded, which, when simply converted to an annual basis, shows that it is maintaining the level of previous years.

Korean natural gas finance is held by the public finance sector at 50.6% (KRW 17.8 Tr.) and the private sector at 49.4% (KRW 17.4 Tr.). The institution with the largest holding in public finance is the NPS, accounting for 48.3% (KRW 8.6 Tr.) of the total public finance sector, followed by the KEXIM with KRW 5.3 Tr.(ship finance) and the KDB with KRW 1.0 Tr.(corporate loans). In the private finance sector, banks and life insurance accounted for 34.1% and 34.5% of the private finance sector, respectively, accounting for 69% of the entire private finance sector. Both sectors invested most heavily in power generation and city gas industries in the form of corporate loans and bonds.

Analysis by industry shows that power generation accounts for KRW 15.7 Tr.(44.6%) and city gas accounts for KRW 9.8 Tr.(28%), together making up over 70% of the total. By asset type, corporate bonds account for KRW 17.9 Tr.(51.0%), followed by loans at KRW 9.7 Tr.(27.8%) and ship finance at KRW 6.4 Tr.(18.2%).

The chart below shows the top financial institutions by investment amount in the power generation sector, where Korean financial institutions invest the most. In the private finance sector, Woori Bank has the largest investment amount, followed by NH Nonghyup Bank and KB Kookmin Bank. In the public finance sector, the NPS has a significantly larger investment scale than other institutions, followed by KDB and IBK.

Unit: KRW 100 Million

Top Korean Institutions by LNG Power Generation Investment Amount (2023.06)							
		Bonds	PF	Corporate Loans	etc (Equity Investment, etc.)	Total	
Private	Bank	Woori Bank	-	3,170	7,065	-	10,235
		NH Nonghyup Bank	600	902	2,096	-	3,598
		KB Kookmin Bank	-	-	3,404	-	3,404
		Shinhan Bank	3,124	-	-	-	3,124
		NACF	-	127	1,924	-	2,051
	Insurance	Kyobo Life Insurance	-	8,289	1,356	-	9,645
		Samsung Life Insurance	2,856	5,215	-	-	8,071
		TongYang Life Insurance	3,742	524	278	-	4,544
	Securities Firm	Samsung Securities	1,509	-	-	-	1,509
		Shinyoung Securities	400	-	-	-	400
		Hanwha Investment & Securities	100	-	-	-	100
Public	NPS	60,174	-	-	153	60,327	
	KDB	-	1,465	10,136	-	11,601	
	IBK	-	975	382	-	1,357	

LNG power plants have a long lifespan, which makes them relatively vulnerable to the risk of becoming stranded assets. Moreover, the government's policy to introduce up to 50% hydrogen co-firing in LNG power generation, based on the assessment that it can significantly reduce carbon emissions compared to existing LNG power plants, may face considerable friction due to the lack of economic viability of hydrogen prices during the hydrogen transition period. This could act as a significant financial risk for financial institutions that have invested in LNG power generation. The 10th Basic Plan for Electricity Supply and Demand (January 2023) also announced a plan to maintain the share of natural gas as a transition energy source for a certain period and then reduce its share in power generation to 9.3% by 2036 (from 26.8% in 2018). This can be interpreted as implying that LNG plays a temporary role in the transition to renewable energy and, like other fossil fuels, should be phased out for Net-Zero.

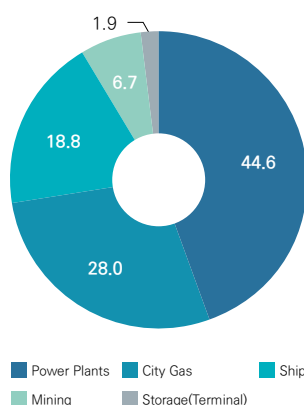
Furthermore, LNG, along with coal and oil, is a major climate pollutant, generally containing 85–95% methane (CH₄), which is known to have a greenhouse gas effect 80 times greater than carbon dioxide (CO₂) over 20 years (20 times greater over 100 years). Additionally, the LNG supply chain is prone to leaks, resulting in significant lifecycle emissions from extraction to end use.

Therefore, financial institutions need a thorough policy for natural gas finance investments, both in terms of future financial risks and environmental considerations.

**Graph 3 Proportion by Industry
(Excluding Insured Amount)**

(As of the End of June 2023)

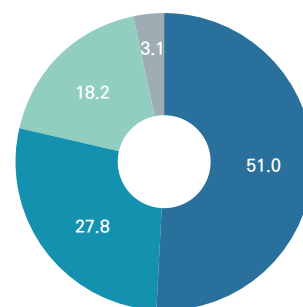
Unit: %



**Graph 4 Proportion by Asset
(Excluding Insured Amount)**

(As of the End of June 2023)

Unit: %



Financial Climate Risk Management

1 Climate Risk Management Begins:
Risk Identification

2 Climate Risk Management Implementation:
Coal/Fossil Fuel Phase-Out Finance

Financial Climate Risk Management

1. Climate Risk Management Begins: Risk Identification

81.78 Million Tons

Financed Emissions from PF and Corporate Bonds of Korean Financial Institutions
(Based on Balance at the End of June 2023)

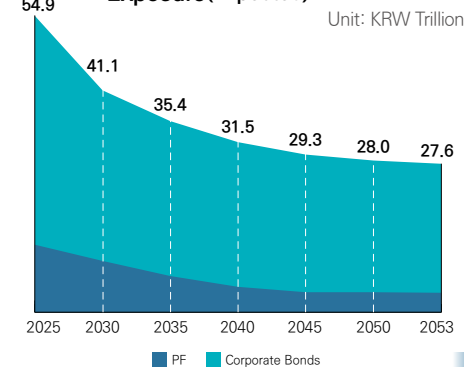
Managing climate risk requires identifying potential hazards and assessing their potential impact. Climate risks are divided into two categories: physical risks and transition risks. Physical risks refer to damage or loss that can be physically caused by natural disasters or temperature changes. Transition risks refer to the losses that can be incurred due to social changes such as carbon price changes, consumer behavior changes, and regulations and policies. Scenario analysis is one of the most common methods for assessing climate risk. NGFS^{Network for Greening the Financial System} provides pathways for various factors that can have financial impacts under different climate change scenarios.

This page aims to analyze the potential financial risks from coal assets reported by financial institutions, using carbon price as a factor that can affect businesses and financial institutions due to climate change.

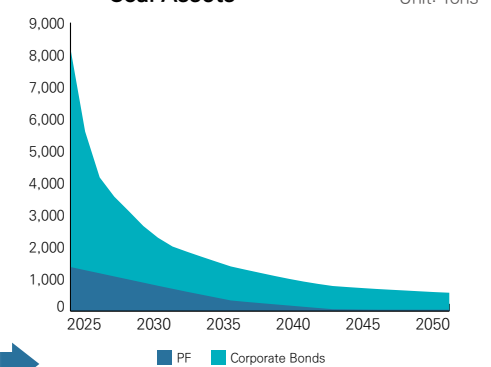
〈Graph 1〉 below shows the expected balance of PF and corporate bonds reported by financial institutions by period. 〈Graph 2〉 represents financed emissions calculated according to the standards of PCAF^{Partnership for Carbon Accounting Financials} using the expected balance and the emissions of the invested PF and companies.¹ The calculated emissions are figures that exclude loans and equity investments (stocks) for which it is difficult to identify the invested companies, overseas PF and corporate bonds, and Scope 3 emissions. Therefore, the actual financed emissions may be higher than the analysis results. In addition, since Samcheok and Gangneung Power Plant, which currently have the largest PF balance, are not included, future emissions are estimated to be even larger.² Moreover, as this analysis only considers coal assets, it is expected that the financed emissions of Korean financial institutions will be even greater if oil and gas-related assets are included.

As shown in the graph, financed emissions from coal PF and corporate bonds sharply decrease until 2030. This is because most of the bonds of KEPCO and its subsidiaries, which account for 74.6% of the total balance, mature before 2030. After 2030, financed emissions decline gradually until 2045. After 2045, the emission reduction rate falls below 5%, leaving approximately 5.71 Mt of financed emissions in 2050. It appears that achieving Net-Zero by 2050 will be difficult if the current maturity schedule of coal-related assets held by financial institutions is maintained.

Graph 1 The Flow of PF, Corporate Bond Exposure(Expected)



Graph 2 Annual Financed Emissions by Coal Assets¹



¹ Calculation Methodology: PCAF Emission Factor: PF, Corporate Bonds – Power Plants and Companies 2022 Emissions Statement (Scope 1+2) / Figures reflecting only Korean projects and corporate investments

² The emissions of the Samcheok Power Plant and Gangneung Power Plant remain unconfirmed as the reporting period has not started since their initial commercial operation.

The carbon cost can be calculated by multiplying the annual projected emissions by the carbon price. Carbon cost is one of the transition risk factors that can be identified through scenario analysis.

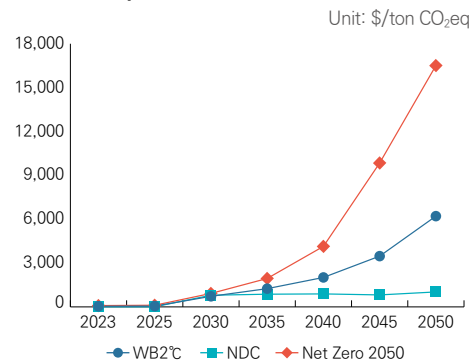
Carbon costs, which can be identified through financed emissions, refer to the cost that the invested or loaned company must bear due to the emissions. This could be the cost of investing in technology for emission reduction or a carbon tax imposed due to emissions. Carbon costs have a financial impact on businesses, which can be transferred to financial institutions in the form of poor debt repayment ability

The annual carbon cost due to financed emissions is shown in <Graph 4> below. The three graphs represent the values obtained by applying the annual carbon price of the NDC^{Nationally Defined Contribution}, WB2C^{Well-Below2°C}, and Net-Zero 2050 scenario, respectively. The annual carbon price for each scenario can be found in <Graph 4>.

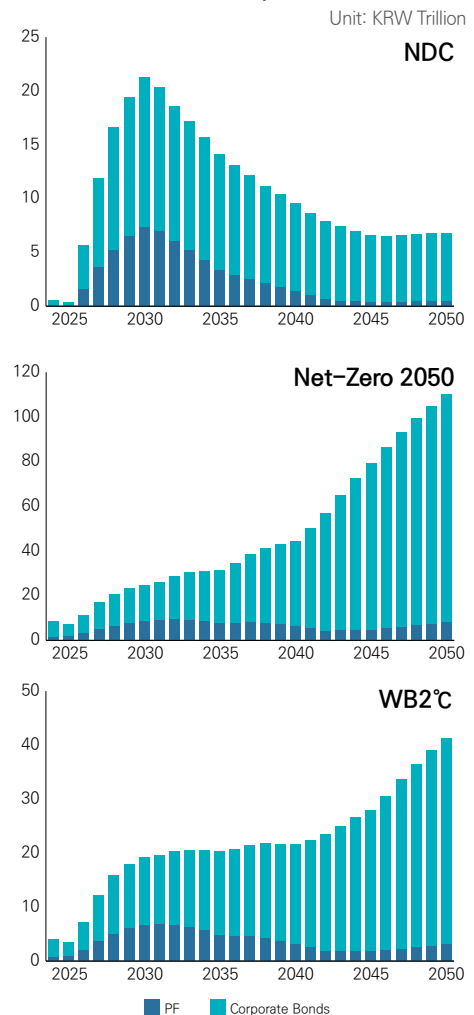
The result of applying the carbon price of all three scenarios show that the annual carbon cost exceeds KRW 10 Tr. in 2027 and KRW 20 Tr. in 2031. In the NDC scenario, the carbon cost peaks in 2030 and then declines, but is not expected to fall below KRW 7 Tr. per year. During this period, the coal balance is projected to continuously decrease, but the carbon cost will either remain steady or increase. This indicates that the magnitude of the risk does not decrease even if coal assets decrease. The NDC scenario, which is expected to have the highest temperature increase among the three scenarios, is also interpreted as having a considerable risk associated with coal. The cumulative carbon cost up to 2050 is KRW 288 Tr. for NDC, KRW 591 Tr. for WB2C, and KRW 1,271 Tr. for Net-Zero 2050.

Effective risk management involves not only responding to approaching risks but also preventing them from occurring in the first place. Investments by financial institutions have a direct and indirect impact on industries. Fossil fuel investments contribute to the fossil fuel industry, which in turn exacerbates global warming. The impact of such financial activities returns to financial institutions in the form of risk transfer, as explained earlier. While it is important to consider how external factors identified in scenarios can affect our interests, considering that current investments can determine the actual path of the economy and society will enable a broader range of risk management.

Graph 3 Trends in Korean Carbon Prices by NGFS Scenario³



Graph 4 Annual Carbon Cost Due to Korean Coal PF and Corporate Bond Balance



2. Climate Risk Management Implementation: Coal/Fossil Fuel Phase-Out Finance

114

Korean Financial Institutions that Have Declared Coal Phase-out

The declaration of coal phase-out by financial institutions is not an exaggeration to say that it is the first step in implementing climate risk management. There are 114 Korean financial institutions that have declared a coal phase-out. However, it has been found that coal investment assets are steadily increasing. This is because the coal phase-out declaration by financial institutions is limited to restricting new investments, not a complete restriction on coal investment.

Classification of Financial Institutions' Coal Phase-out Declaration Levels

1. Cessation of New Investments
2. Withdraw or Revocation of Existing Investments(or Contracts)

The coal phase-out declarations of financial institutions can be divided into two levels:

1. Cessation of New Investments: This means no longer making new investments in coal projects or companies engaged in coal-related businesses. This includes suspending new PF and loan contracts or stopping the purchase of corporate bonds and stocks. Due to the successive coal phase-out declarations by Korean financial institutions from 2020 to 2021, new contracts for overseas and Korean coal PFs have been significantly reduced. However, in this case, additional loans may occur even after the declaration for the contracted number of existing investments.
2. Withdrawal or Revocation of Existing Investments(or Contracts): This means withdrawal existing investments. Methods include selling existing corporate bonds and equity investments and encouraging early repayment of loans. GFANZ has cited the phasing out of high-emission assets as one of the four strategies for Net-Zero finance and emphasized the importance of managing coal assets, particularly in Asia.¹

Among the 55 institutions that declared coal phase-out in this survey, the following 5 institutions indicated their willingness to withdraw existing investments. Excluding 9 institutions that did not report their declaration level, 41 institutions have only declared a suspension of new investment.

The assets of the 5 institutions that expressed their willingness to withdraw existing investments amount to KRW 489.7 Tr.² All 5 institutions stated that they would apply the following declaration to coal-fired power plants and related projects. In particular, KDB, which reported the second largest coal exposure after the NPS among the reporting institutions, responded that it also applies the existing investment withdrawal criteria to equity investments, which account for the largest portion of exposure. However, it also responded that it considers the criteria for defining coal companies to be a 50% coal revenue proportion, suggesting a need for discussion on whether the criteria for risk management are sufficient.

The declaration of coal phase-out by financial institutions has shown that many Korean financial institutions recognize the risks of coal assets. However, even now, six years after the first coal phase-out declaration, there is no sign of coal assets decreasing.

Table 1 Korean Financial Institutions that Declared Withdrawal of Existing Coal Investments³

Name	Year of Declaration	Asset Applicable to Declaration
Samsung Fire & Marine Insurance	2020	PF, Corporate Loans, Stocks, Special Purpose Bonds
SK Securities	2021	PF, Corporate Loans, Stocks, Special Purpose Bonds, General Bonds
Mirae Asset Securities	2021	PF, Corporate Loans, Stocks, Special Purpose Bonds, General Bonds
KDB	2023	PF, Corporate Loans, Stocks, General bonds
DWS Asset Management	2023	PF, Corporate Loans, Stocks, Special Purpose Bonds, General Bonds

¹ GFANZ, Recommendations-and-Guidance-on-Financial-Institution-Net-zero-Transition-Plans-November-2022, 8-9p

² Among the five institutions, DWS Asset Management's total assets are not reported, so they are combined as 0 won.

³ Other Korean coal phase-out declaration organizations are listed in Appendix 2. Verifiable

Furthermore, managing not only coal but also gas and oil assets is essential for the Net-Zero transition of financial institutions. Both fuels have GHG emission intensities comparable to coal, and continued investment in them will inevitably make it difficult to reduce financed emissions.

In the case of LNG, methane leaks and is released into the atmosphere during processes such as extraction, pipeline transportation, and cargo shipping. Methane's impact on global warming is 81.2 times greater than that of carbon dioxide.⁴ Methane leaking from gas production areas in the United States accounts for about 30% of production.⁵ Including emissions leaked during transportation and storage, methane emissions are expected to be even greater. This is why replacing coal with LNG is criticized as not being a solution for reducing greenhouse gases and why careful decisions must be made regarding LNG investment.

Risk management is achieved not only through awareness but also through proactive improvement. Financial institutions have demonstrated their recognition of climate risks through coal phase-out declarations. From now on, to implement Net-Zero, financial institutions need to review their coal phase-out levels and expand their scope.

Table 2 Fossil Fuel Management Standards by Institution

Fuel Classification	IPCC (1.5°C) ⁶	IEA ⁷	UN HLEG ⁸	NGFS ⁹
Coal	Reduce the share of coal in global primary energy by 95% by 2050	Abolition of coal-fired power plants by 2030 in advanced economies, and by 2040 globally	Abolish all loans, insurance, and investment assets related to coal-fired power generation by 2030 in OECD countries and by 2040 in non-OECD countries	Energy mix ratio – 16% in 2030 – 4% in 2050
Oil	Reduce the share of oil in global primary energy by 60% by 2050	Total ban on new oil development after 2021, closure of oil-fired power plants by 2040	(1) Development of New Oil and Gas Fields (2) Expansion of mining	Energy mix ratio – 32% in 2030 – 12% in 2050
Natural Gas	Reduce the share of gas without CCS in global primary energy by 70% by 2050	Ban on new gas field development after 2021, with gas power generation to account for 0.2% of electricity by 2050	(3) Suspension of All Financial Support for Production	Energy mix ratio – 18% in 2030 – 9% in 2050

⁴ AR6 WGI Report – List of corrigenda to be implemented, 27p

⁵ US oil and gas system emissions from nearly one million aerial site measurements, Nature vol 627, 328p

⁶ IPCC, AR6 WG3 Full Report, 353p

⁷ IEA, Net Zero Roadmap 2023 update, 92p

⁸ UN HLEG, Integrity Matters, 24p

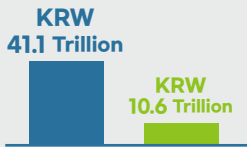
⁹ NGFS Phase 4 Scenario Explorer, Model-GCAM 6.0 NGFS, Scenario-Net Zero 2050

Investment Trend of Korean Renewable Energy Finance

Renewable Energy vs. Fossil Fuels:
The Trend of New Investments

Investment Trend of Korean Renewable Energy Finance

Renewable Energy vs. Fossil Fuels: The Trend of New Investments



A Comparison of New Investment Amounts in Korean Fossil Fuels and Renewable Energy (As of 2022)

New investments in renewable energy by Korean financial institutions amounted to KRW 10.6 Tr. in 2022. This figure was only about a quarter of the amount invested in fossil fuels. While new investments in fossil fuels have quadrupled compared to 2020, investments in renewable energy have decreased slightly. This trend contrasts with the global trend of investment in energy transition. This situation raises concerns not only about achieving national greenhouse gas reduction targets but also about future national competitiveness in a new trade environment where the use of renewable energy is becoming essential.

Global vs. Korean New Investment in Renewable Energy and Fossil Fuels

At the COP28 held in Dubai in 2023, “The Global Renewable and Energy Efficiency Pledge” was announced, aiming to triple renewable energy capacity and double energy efficiency by 2030.¹ More than 130 countries, including South Korea, participated in the pledge. This symbolically demonstrates that the transition from fossil fuels to renewable energy has become an inevitable and irreversible global trend.

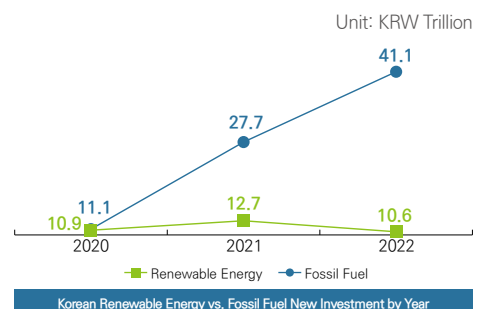
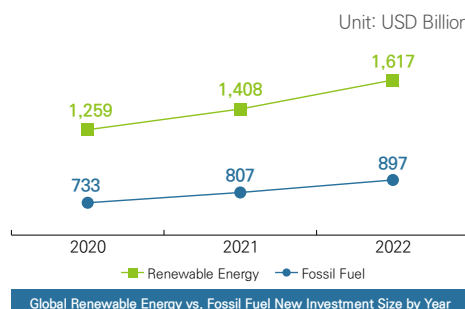
In fact, the global energy transition is already well underway. According to the World Meteorological Organization(WMO), the amount of renewable energy capacity added in 2023 was a total of 510 GW, an increase of about 50% compared to 2022.²

This trend is even more evident when examining the trend of new investments in renewable energy compared to fossil fuels. According to an IEA survey, the gap between global new investment in fossil fuels and renewable energy has gradually increased from 2020 to 2022. In 2020, the new investment in renewable energy and fossil fuels was USD 1.259 Tr. and USD 733 Bi., respectively, a difference of about 1.7 times. In 2022, the figures were USD 1.617 Tr. and USD 897 Bi., respectively, showing a steady difference of about 1.8 times. From 2020 to 2022, there was also a difference of about 1.7 times in the cumulative new investment in renewable energy and fossil fuels, indicating that investment in energy transition has already become the new normal.³

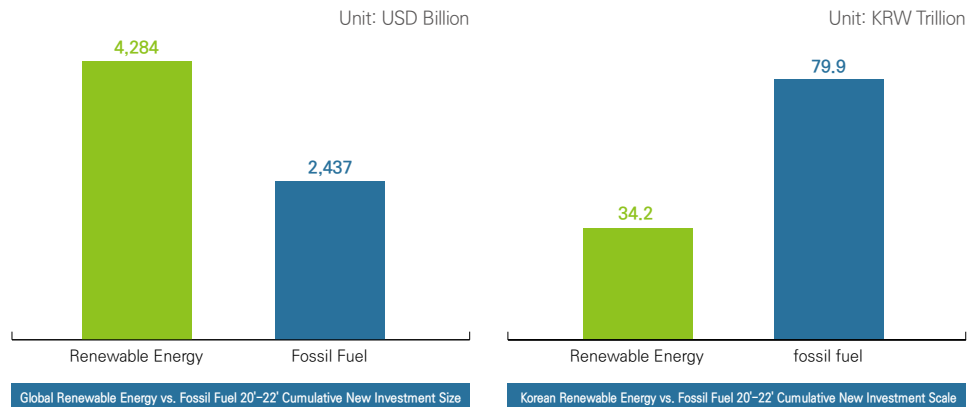
In contrast, the trend of new investment in renewable energy in Korea shows a contrasting pattern to the global trend. In 2020, the difference in new investment between renewable energy and fossil fuels was KRW 10.9 Tr. and KRW 11.1 Tr., respectively, showing almost no difference. However, from 2021, investment in fossil fuels began to increase rapidly. As of 2022, renewable energy investment was KRW 10.6 Tr., while fossil fuel investment was KRW 41.1 Tr., with fossil fuel investment being about 3.9 times higher than renewable energy investment. During the same period, the cumulative new investment in renewable energy was KRW 34.2 Tr., while fossil fuels amounted to about KRW 79.9 Tr., a difference of about 2.3 times.

- 1 Global Renewables and Energy Efficiency Pledge
- 2 WMO, State of the Global Climate 2023
- 3 IEA, Global Investment in the Power Sector by Technology 2011–2022
- 4 Fossil fuels include coal, oil, and natural gas. The graph compares newly made investments in these fuels.
- 5 A comparison is made for the years 2020–2022, as the NPS provides new investment data based on 2020
- 6 IEA, World Energy Investment 2023

Graph 3 Trends in New Investments in Renewable Energy and Fossil Fuels by Global and Korean Financial Institutions^{4, 5, 6}



Graph 2 Cumulative New Investment in Renewable Energy and Fossil Fuel by Global and Korean Financial Institutions(2020~2022)



■ Comparison of the Growth Rate of New Investments in Korean Financial Institutions in 2021 vs. 2022

In 2021 and 2022, there was a sharp increase in fossil fuel investments by Korean financial institutions. This is considered a temporary phenomenon due to the global energy crisis triggered by the Russia-Ukraine war and the resulting expansion of natural gas use. However, it is also important to note that the scale of new investment in renewable energy is stagnating or decreasing. According to the new and renewable energy supply statistics, the new installation capacity of new and renewable energy actually decreased during the same period.

In 2022, the new investment in fossil fuels by public and private finance increased by 75% and 22%, respectively, compared to 2021. In 2021, public finance made new investments of approximately KRW 3.6 trillion in renewable energy and KRW 13 Tr. in fossil fuels. A year later, with KRW 2.8 Tr. and KRW 22.7 Tr., respectively, the difference in the new investment amount between the two energy sources reached a staggering 8.1 times. Comparing the new investment growth rates, renewable energy showed a growth rate of (-)22%, while fossil fuels showed a growth rate of 75%. Private finance saw a significant decrease in new renewable energy investment. In 2021, the new investment in renewable energy by private finance was approximately KRW 9.1 Tr., but the following year, in 2022, the investment amount decreased by 69% to approximately KRW 2.8 Tr.. In contrast, new investment in fossil fuels by private finance grew by 22%, from KRW 14.9 Tr. in 2021 to KRW 18.2 Tr. in 2022..

In the private finance sector, banks were the sector with the most overwhelming increase in new fossil fuel investment in terms of both amount and proportion within a year. Although the growth rate is lower than that of securities companies, the scale of funds operated for new fossil fuel investment was large, with a difference of about KRW 3.8 Tr.. This is because new investment in fossil fuels can still occur due to loan agreements concluded before the declaration of coal phase-out by banks.

Securities companies were the sector with the highest growth rate in new fossil fuel investment in the private finance sector. In particular, the new investment in fossil fuel corporate bonds increased significantly in 2022, requiring attention. Non-life insurance companies (-)14%, life insurance companies (-)26%, and asset management companies (-)17% showed a slowdown in new fossil fuel investment growth. In contrast, banks 60% and securities companies 82% showed a significant increase in new investment in fossil fuels compared to the previous year.

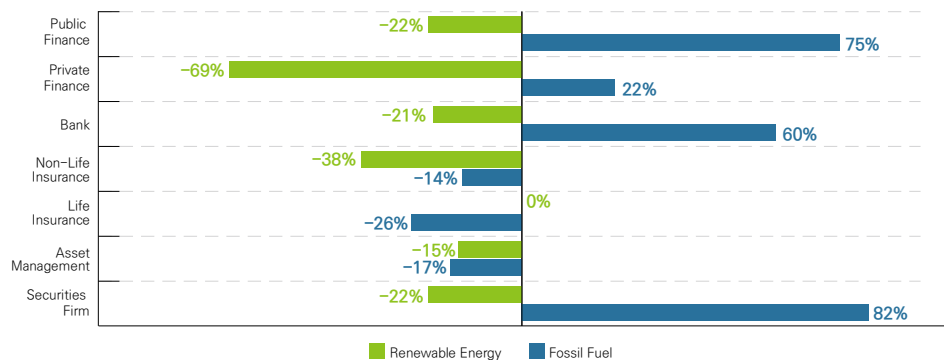
Even though the new fossil fuel investment growth rate in the private finance sector is negative, the new investment growth rate in renewable energy is not positive either. The new investment growth rate in renewable energy decreased year-on-year in all sectors: life insurance companies 0%, asset management companies (-)15%, banks (-)21%, securities companies (-)22%, and non-life insurance companies (-)38%.

Graph 3 Comparison of New Investment Volumes by Korean Financial Institutions in 2021 vs. 2022

Unit: KRW Trillion



Graph 4 Comparison of Growth Rates of New Investments in Renewable Energy vs. Fossil Fuels(2021 vs. 2022)



20

The Number of Korean Financial Institutions with a Specific Roadmap for New Renewable Energy Investments

Korean Financial Institutions' New Investment Plans for Renewable Energy

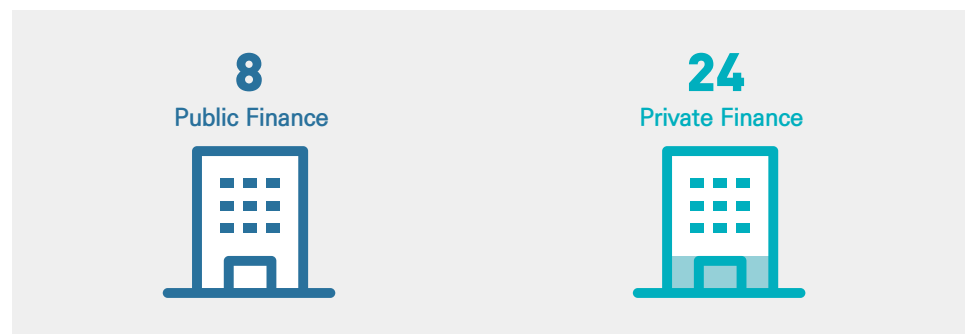
The total amount of new renewable energy investment targets by 2030, as responded to by Korean financial institutions through a survey, was KRW 16 Tr.. A total of 32 financial institutions (8 public and 24 private) responded that they have new investment plans for renewable energy. Among them, 20 institutions answered that they have a concrete roadmap, while the remaining 12 institutions did not present a specific roadmap.⁷

In the case of private finance, most of the institutions that responded that they have new investment plans also presented a renewable energy investment roadmap, including specific amounts and target years. However, none of the public financial institutions presented a concrete investment plan or roadmap. In particular, it is a matter of great concern that institutions playing important roles in the Korean financial market, such as KDB and the NPS, do not have a concrete roadmap. Meanwhile, the KEXIM, which responded last year that it had established a roadmap, refused to respond this year.

Breaking down the new investment target by period, they announced that they would invest approximately KRW 1.5 Tr. by 2024 and approximately KRW 16 Tr. by 2030. The total target amount of public finance by 2030 was only KRW 550 Bi.. Considering the past investment scale of public financial institutions in renewable energy, it seems more reasonable to assume that they did not faithfully respond to the survey or have not properly established mid- to long-term plans, rather than assuming that the actual investment amount is at this level.

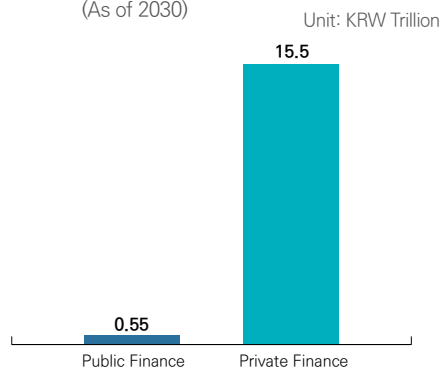
A closer look at the new investment roadmap shows that the new investment amount for renewable energy projects currently under consideration by Korean financial institutions is approximately KRW 9 Tr., of which about 73%(KRW 6.7 Tr.) is planned to be used for Korean renewable energy project investment. Investments of about KRW 3 Tr. in solar power projects and about KRW 2.2 Tr. in wind power projects are being considered. The remaining 26%(KRW 2.3 Tr.) is planned to be invested in various overseas projects in countries like Germany, Canada, the United States, and Taiwan, with the largest amount, KRW 2 Tr., being invested in solar power projects.

Graph 5 Financial Institutions Establishing New Investment Plans for Renewable Energy

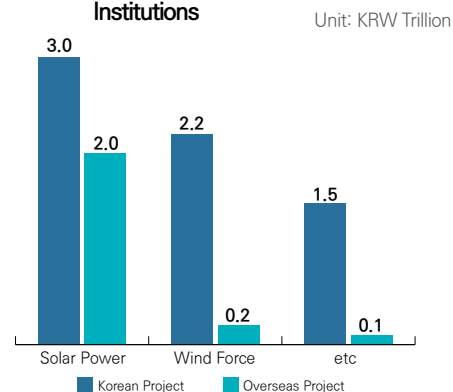


⁷ Institutions with only a target year in their roadmap are excluded

Graph 6 Comparison of New Renewable Energy Investment Targets of Public and Private Finance
(As of 2030)



Graph 7 The New Investments in Renewable Energy Projects Currently under Review by Korean Financial Institutions



The Korean government announced a target to increase the proportion of renewable energy generation to 21.6% by 2036 through the 10th Basic Plan for Electricity Supply and Demand in 2023. This represents a significant downward revision from the 30.2% previously proposed during the establishment of NDC targets. The recently announced working-level draft of the 11th Basic Plan for Electricity Supply and Demand also maintained the same target level of 72 GW. As of 2022, Korea's renewable energy generation capacity is 32.5 GW, falling far short of the target of tripling by 2030 that the Korean government promised to the international community.

Despite the recent increase in private sector initiatives to purchase renewable energy, such as RE100, the government's policy commitment remains the most critical factor in the diffusion of renewable energy. And the most accurate reflection of that policy commitment is the budget. According to the Ministry of Trade, Industry and Energy's 2024 budget proposal, the budget for renewable energy support projects has been reduced to KRW 605.4 Bi., a decrease of KRW 440 Bi. from the previous year.

The IEA revised its 2023 global renewable energy forecast upward by 33%(or 728 GW) compared to its December 2022 announcement.⁸ On the other hand, Korea's forecast was revised downward, citing continued uncertainty in energy policy as the reason. Consistent policy direction and stability are the most basic prerequisites for financial investment. In March 2023, the Financial Services Commission announced plans to expand financial support to address the climate crisis. The plan is to procure a total of KRW 420 Tr. by 2030 for renewable energy projects through public financial institutions(KDB, KEXIM, IBK, Korea Credit Guarantee Fund, and Korea Technology Finance Corporation). The KDB and five commercial banks(KB Kookmin, Shinhan, Hana, Woori, and NH Nonghyup Bank) will contribute a total of KRW 9 Tr. by 2030 to create a new Future Energy Fund. For these plans to be properly implemented, the government must lead financial policies with a consistent direction.

⁸ IEA, Renewables, 2023

Appendix

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- 1 Top 5 Financial Institutions by Sector Based on Total Fossil Fuel Investment
 - 2 Current Status of Coal and Fossil Fuel Net-Zero Goals
 - 3 Status of the Membership of Net-Zero and Climate Finance Initiatives

Appendix 1

Investment

Top 5 Financial Institutions by Sector based on Total Fossil Fuel

(As of June 30, 2023)

Unit: KRW 100 Million

Sector	Institution Name	Total Assets	Coal	Oil	Natural Gas	Total Fossil Fuel Investment	Ratio
Bank	National Agricultural Cooperation Federation	1,242,596	48,572	4,627	17,952	71,150	5.7%
	Hana Bank	4,755,299	37,138	22,436	10,598	70,171	1.5%
	NH Nonghyup Bank	3,921,926	22,936	8,508	16,149	47,593	1.2%
	Woori Bank	4,241,281	5,525	14,300	21,704	41,529	1.0%
	KB Kookmin Bank	5,063,948	5,969	7,529	8,487	21,985	0.4%
Life Insurance	Hanwha Life Insurance	1,108,993	36,492	3,473	11,093	51,058	4.6%
	Samsung Life Insurance	2,667,860	19,341	4,862	17,010	41,213	1.5%
	NH Nonghyup Life Insurance	532,806	13,843	3,326	11,897	29,067	5.5%
	Kyobo Life Insurance	1,064,771	12,486	1,986	11,994	26,466	2.5%
	Heungkuk Life Insurance	248,184	16,607	714	3,517	20,839	8.4%
Non-Life Insurance	DB Insurance	415,390	18,690	0	6,418	25,108	6.0%
	Samsung Fire & Marine Insurance	799,684	11,673	1,135	4,286	17,094	2.1%
	Hyundai Marine & Fire Insurance	424,791	9,290	2,640	5,019	16,949	4.0%
	Lotte Insurance	144,008	9,911	0	4,826	14,737	10.2%
	KB Insurance	352,489	7,769	3,785	2,775	14,330	4.1%
Asset Manager	Hanwha Asset Management	450,104	39,792	4,766	16,361	60,919	13.5%
	KDB Korea Infrastructure Asset Management Company	145,582	18,528	489	8,969	27,986	19.2%
	Midas Asset	69,261	14,170	271	-	14,441	20.8%
	NH-Amundi Asset Management	124,467	694	853	6,146	7,693	6.2%
	Woori Asset Management	292,413	5,354	325	1,618	7,297	2.5%
Securities Firm	Korea Investment & Securities	719,770	10,000	400	1,977	12,377	1.7%
	Samsung Securities	70,704	1,575	2,133	2,280	5,988	8.5%
	Shinyoung Securities	102,550	39	1,906	1,100	3,045	3.0%
	Hanwha Investment & Securities	122,063	2,441	0	400	2,841	2.3%
	Shinhan Investment Securities	240,535	0	82	1,917	1,999	0.8%
Public Finance	National Pension Service Investment Management *	9,860,679	232,091	291,459	0	523,549	5.3%
	Korea Development Bank	3,193,000	179,673	35,069	41,096	255,838	8.0%
	Korea Eximbank	1,273,920	28,196	86,937	114,368	229,501	18.0%
	Korea Trade Insurance Corporation*	0	22,209	30,669	44,665	97,543	0.0%
	Korea Post	1,499,670	31,818	23,231	14,774	69,822	4.7%
	Korea Ocean Business Corporation	117,829	0	4,461	4,851	9,312	7.9%
	Teachers' Pension	233,181	3,242	3,663	296	7,201	3.1%
	Industrial Bank of Korea	4,070,655	1,275	2,360	3,434	7,069	0.2%
	Military Welfare Fund	163,010	147	438	1,456	2,041	1.3%
	Korea Scientists and Engineers Mutual-Aid Association	109,272	0	0	1,521	1,521	1.4%

* The total assets of the National Pension Service are as of May 31, 2023, and the oil amount includes the oil and natural gas amounts.

* KTIC reflected the insured amount

Appendix 2

Current Status of Coal and Fossil Fuel Net-Zero Goals

(As of June 30, 2023)

* Declaration Level 1: Suspension of New Investment / 2: Withdrawal or Revocation of Existing Investment (Gradually) / 3: Early Withdrawal or Revocation of Existing Investment / 4: Suspension of Underwriting for New Companies / 5: Suspension of Underwriting for Companies to Renewal

Institution Name	Net-Zero Goal			Fossil Fuel Phase-Out Goal						
	Goal-Setting Status	Reflection of Financed Emissions	Future Goal-Setting Status	Coal Phase-Out Declaration Status	Declaration Level*	Plan for Withdrawal or Revocation of Existing Investment	Coal Company Regulation Criteria	Fossil Fuel Phase-Out Declaration Status	Coal Investment Plan Status	Oil & Natural Gas Investment Plan Status
Public Financial Institutions										
Korea Scientists and Engineers Mutual-Aid Association	X	-	-	X	-	-	-	X	X	O
National Research Foundation of Korea	X	-	X	X	-	-	-	X	X	X
Korea Post	2050	X	-	X	-	-	-	X	X	X
Ministry of Science and ICT	X	-	-	X	-	-	-	X	X	X
Teachers' Pension	X	-	X	2018	1	X	-	X	X	X
Military Welfare Fund	X	-	-	X	-	-	-	X	O	O
Industrial Bank of Korea	2050	O	-	2022	1	X	-	X	X	O
Korea Development Bank	X	-	O	2022	1,2	-	More than 50%	X	X	O
Korea Eximbank	2040	X	-	X	-	-	-	X	X	O
Korea Investment Corporation	-	-	-	-	-	-	-	-	-	-
Cultural Heritage Protection Fund	-	-	-	-	-	-	-	-	-	-
National Pension Service Investment Management	X	-	-	2021	1	-	-	-	-	-
Radioactive Waste Management Fund	X	-	-	X	-	-	-	X	X	X
Korea Institute for Advancement of Technology	-	-	-	-	-	-	-	-	-	-
Power Industry Infrastructure Fund	-	-	-	-	-	-	-	-	-	-
Korea Trade Insurance Corporation	X	-	-	2021	1	X	-	X	X	O
Government Employees Pension Service	-	-	-	-	-	-	-	-	-	-
National Maritime Museum of Korea	2030	X	O	X	-	-	-	X	X	X
National Marine Biodiversity Institute of Korea	X	-	X	X	-	-	-	X	X	X
Busan Port Authority	2050	X	-	-	-	-	-	-	-	-
Fishers Development Fund	-	-	-	-	-	-	-	-	-	-
Yeosu Gwangyang Port Authority	2050	X	-	-	-	-	-	-	-	-
Ulsan Port Authority	2050	X	-	-	-	-	-	-	-	-
Incheon Port Authority	2050	X	-	-	-	-	-	-	-	-
Korea Fisheries Resources Agency	X	X	O	X	-	-	-	X	X	X
Korean Fisheries Infrastructure Public Agency	X	-	X	-	-	-	-	-	-	-
Korea Navigational Marking Technology Institute	X	-	-	-	-	-	-	-	-	-
Korea Institute of Ocean Science & Technology	X	-	-	-	-	-	-	-	-	-

Institution Name	Net-Zero Goal			Fossil Fuel Phase-Out Goal						
	Goal-Setting Status	Reflection of Financed Emissions	Future Goal-Setting Status	Coal Phase-Out Declaration Status	Declaration Level*	Plan for Withdrawal or Revocation of Existing Investment	Coal Company Regulation Criteria	Fossil Fuel Phase-Out Declaration Status	Coal Investment Plan Status	Oil & Natural Gas Investment Plan Status
Korea Maritime Transportation Safety Authority	X	-	O	-	-	-	-	-	-	-
Korea Institute of Maritime and Fisheries Technology	2050	X	-	-	-	-	-	-	-	-
Korea Hydrography and Research Association	X	-	-	-	-	-	-	-	-	-
Korea Ocean Business Corporation	X	-	-	-	-	-	-	-	-	-
Korea Institute of Marine Science and Technology Promotion	X	-	X	X	-	-	-	-	-	-
Korea Marine Environment Corporation	X	-	X	X	-	-	-	X	X	X
Geum River Water Supply Management Committee	-	-	-	-	-	-	-	-	-	-
Nakdong River Water Supply Management Committee (Fund)	-	-	-	-	-	-	-	-	-	-
Yeongsan River and Seomjin River Water Supply Management Committee	-	-	-	-	-	-	-	-	-	-
Han River Water Supply Management Fund	-	-	-	-	-	-	-	-	-	-
Private Financial Institutions-Bank										
Hana Bank	2050	O	-	2021	1	X	More than 50%	X	O	O
Woori Bank	2050	O	-	2020	1	-	-	X	X	O
Shinhan Bank	-	-	-	-	-	-	-	-	-	-
National Agricultural Cooperative Federation	X	-	-	X	-	-	-	X	X	X
NH Nonghyup Bank	2050	O	-	2021	1	-	-	X	X	X
KB Kookmin Bank	2050	O	-	2020	1	To be discussed	-	X	X	O
Jeju Bank	2044	O	-	2021	1	X	-	X	X	X
Jeonbuk Bank	2045	O	-	2022	1	X	-	X	X	X
iM Bank, DGB Financial Group	2050	O	-	2021	1	To be discussed	-	X	X	X
Kwangju Bank	2045	O	-	2022	1	X	-	X	X	X
Busan Bank	2050	O	-	2021	1	X	-	X	X	X
BNK Kyongnam Bank	2050	O	-	2021	1	X	-	X	X	X
Private Financial Institutions-Life Insurance										
NH Nonghyup Life Insurance	2050	O	O	2021	1,4	X	etc	X	X	O
Hanwha Life Insurance	2050	O	O	2021	1,4	X	More than 50%	X	X	X
Heungkuk Life Insurance	X	-	-	X	-	-	-	X	X	X
Tongyang Life Insurance	X	-	-	X	-	-	-	X	O	O
ABL Life Insurance	X	-	-	X	-	-	-	2028	X	X
Shinhan Life Insurance	2050	O	O	X	-	-	-	X	X	X
Samsung Life Insurance	2050	O	O	2020	1,4	X	30% or more	2023	X	X
Mirae Asset Life Insurance	X	-	-	X	-	-	-	X	X	X
MetLife	2050	O	O	X	-	-	-	2025	X	X

Institution Name	Net-Zero Goal			Fossil Fuel Phase-Out Goal						
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Kyobo Life Insurance	X	–	–	2021	1	To be discussed	–	X	X	O
KDB Life Insurance	X	–	–	X	–	–	–	X	X	X
KB Life Insurance	2050	O	O	2020	1	–	–	O	X	X
IBK Insurance	X	–	–	X	–	–	–	X	X	X
DGB Life Insurance	X	–	–	X	–	–	–	X	X	X
iM Life Insurance	X	–	–	X	–	–	–	X	O	O
AIA Life Insurance	2050	O	O	X	–	–	–	X	X	X
Private Financial Institutions–Non-Life Insurance										
SGI Seoul Guarantee Insurance	2050	O	O	2021	1,4	O	etc	X	X	O
Hyundai Marine & Fire Insurance	X	–	–	2022	1, 4	To be discussed	–	X	X	X
Hanwha General Insurance	2050	X	X	2021	1,4	X	etc	X	O	O
Heungkuk Fire & Marine Insurance	X	–	–	2021	1,4	X	–	X	X	X
Korean Reinsurance	2050	O	O	2022	1,4	X	–	X	–	–
Samsung Fire & Marine Insurance	2050	O	O	2020	1,3,4	To be discussed	30% or more	2023	X	X
Lotte Insurance	X	–	–	2021	4	–	etc	X	X	X
NH Nonghyup Insurance	2050	O	O	2021	1,4	X	etc	X	X	X
KB Insurance	2050	O	O	2019	1,4	X	–	X	X	X
DB Insurance	2050	X	X	2019	1	X	etc	X	X	X
Private Financial Institutions–Securities Firm										
Hyundai Motor Securities	2045	X	X	2021	1	X	–	X	X	O
Hanwha Investment & Securities	X	–	–	2021	1	–	–	X	X	X
Bookook Securities	X	–	–	X	–	–	–	X	O	O
Korea Investment & Securities	X	–	–	2020	1	X	20% or more	X	X	O
Hana Securities	2050	X	X	2021	1	X	etc	X	X	O
Heungkuk Securities	X	–	–	X	–	–	–	X	X	X
Cape Investment & Securities	X	–	–	X	–	–	–	X	X	X
Kakaopay Securities	X	–	–	X	–	–	–	X	X	X
Eugene Investment	X	–	–	X	–	–	–	X	X	X
Yuanta Securities Korea	–	–	–	X	–	–	–	X	X	X
Shinhan Securities	2044	O	O	X	–	–	–	X	O	O
SangsangIn Investment & Securities	X	–	–	X	–	–	–	X	O	O
Samsung Securities	X	–	–	2020	1	X	–	X	X	O
Mirae Asset Securities	2050	O	O	2021	1, 2	–	More than 50%	Undecided	X	O
Meritz Securities	X	–	–	X	–	–	–	X	X	X
Daishin Securities	X	–	–	X	–	–	–	X	X	X
Kiwoom Securities	X	–	–	X	–	–	–	X	X	X
Daol Investment & Securities	미정	X	X	2021	1	O	–	X	X	X
Kyobo Securities	X	–	–	2021	1	O	–	X	X	X
KB Securities	2050	O	O	2020	1	X	–	X	X	X

Institution Name	Net-Zero Goal			Fossil Fuel Phase-Out Goal						
	Goal-Setting Status	Reflection of Financed Emissions	Future Goal-Setting Status	Coal Phase-Out Declaration Status	Declaration Level*	Plan for Withdrawal or Revocation of Existing Investment	Coal Company Regulation Criteria	Fossil Fuel Phase-Out Declaration Status	Coal Investment Plan Status	Oil & Natural Gas Investment Plan Status
IBK Securities	X	-	-	X	-	-	-	X	X	X
iM Securities	2050	-	-	2021	1	O	-	X	X	X
BNK Securities	2045	X	X	2021	1	X	-	X	X	X
Hanyang Securities	X	-	-	X	-	-	-	X	X	X
Korea Asset Investment Securities	X	-	-	X	-	-	-	X	O	O
LS Securities	X	-	-	X	-	-	-	X	X	X
Yuhwa Securities	X	-	-	X	-	-	-	X	X	X
Shinyoung Securities	X	-	-	X	-	-	-	X	X	X
Leading Investment & Securities	X	-	-	X	-	-	-	X	O	O
SK Securities	2050	O	O	2021	1,2,3	-	30% or more	X	X	X
DS Investment & Securities	X	-	-	X	-	-	-	X	X	X
DB Financial Investment	-	-	-	-	-	-	-	-	-	-
Toss Securities	X	-	-	X	-	-	-	X	X	X
Private Financial Institutions-Asset Manager										
Hyundai Investments	X	-	-	X	-	-	-	X	X	X
Hanwha Asset Management	X	-	-	2021	1	X	-	X	X	X
Heungkuk Asset Management	X	-	-	X	-	-	-	X	X	X
Woori Asset Management	2050	O	O	2020	1	X	-	X	O	O
Woori Global Asset Management	X	-	-	X	-	-	-	X	X	X
Shinhan Asset Management	2050	O	O	X	-	-	-	X	X	X
Samsung Active Asset Management	X	-	-	X	-	-	-	X	X	X
Mirae Asset Global Investments	X	-	-	X	-	-	-	X	X	X
Multi-asset Asset Management	X	-	-	X	-	-	-	X	O	O
Bearings	2030	X	X	X	-	-	-	X	O	O
DWS Asset Management	2050	X	X	2023	1,2	-	20% or more	X	X	X
Daol Asset Management	X	-	-	X	-	-	-	X	X	X
Kyobo AXA Investment Managers	X	-	-	2021	1	-	-	-	-	-
NH-Amundi Asset Management	X	-	-	2021	1	X	etc	X	X	O
KDB Korea Infrastructure Asset Management Company	X	-	-	X	-	-	-	X	X	X
IBK Asset Management	X	-	-	X	-	-	-	X	X	X
iM Asset Investment & Management	X	-	-	X	-	-	-	-	-	-
BNK Asset Management	2045년	-	-	X	-	-	-	X	X	X
Truston Asset Management	X	-	-	X	-	-	-	-	-	-
Shinyoung Asset Management	X	-	-	X	-	-	-	X	X	X
Midas Asset	-	-	-	2022년	1	-	-	X	-	-

Appendix 3

Status of the Membership of Net-Zero and Climate Finance Initiatives

(As of June 30, 2023)

Initiative	Institution Name
SBTi (Science Based Targets initiative)	Industrial Bank of Korea Hana Financial Group Woori Financial Group NH Nonghyup Financial Group KB Financial Group JB Financial Group DGB Financial Group BNK Financial Group AIA Life Insurance (AIA Group) Shinhan Financial Group Mirae Asset Securities SK Securities DWS Asset Management (Deutsche Bank)
UNFCCC Race to Zero Campaign	Woori Financial Group KB Financial Group DWS Asset Management (Deutsche Bank)
Net-Zero Banking Alliance (Banks)	Industrial Bank of Korea Hana Financial Group Woori Financial Group NH Nonghyup Financial Group KB Financial Group JB Financial Group Shinhan Financial Group
Net-Zero Asset Managers Initiative	Shinhan Financial Group DWS Asset Management (Deutsche Bank)
RE100	Samsung Fire & Marine Insurance KB Financial Group Samsung Life Insurance Mirae Asset Securities
CDP (Carbon Disclosure Project)	Industrial Bank of Korea Hana Financial Group Woori Financial Group NH Nonghyup Financial Group KB Financial Group JB Financial Group DGB Financial Group BNK Financial Group Shinhan Financial Group Samsung Life Insurance Kyobo Life Insurance Hyundai Marine & Fire Insurance Samsung Fire & Marine Insurance Samsung Securities Mirae Asset Securities Kyobo Securities Hanwha Life Insurance Kiwoom Asset Management
PRI (Principles for Responsible Investment)	National Pension Service Investment Management Barings (MassMutual) DWS Asset Management (Deutsche Bank)
PRB (Principles for Responsible Banking)	Industrial Bank of Korea Woori Financial Group NH Nonghyup Financial Group JB Financial Group DGB Financial Group BNK Financial Group KB Financial Group Hana Financial Group Hana Securities Shinhan Financial Group SK Securities DWS Asset Management (Deutsche Bank)
PSI (Principles for Sustainable Insurance)	NH Nonghyup Life Insurance Hanwha Life Insurance Shinhan Life Insurance Samsung Life Insurance Samsung Fire & Marine Insurance Kyobo Life Insurance NH Nonghyup Insurance KB Insurance DB Insurance
Climate Action 100+	Barings (MassMutual) DWS Asset Management (Deutsche Bank)
PCAF (Partnership for Carbon Accounting Financials)	Industrial Bank of Korea Korea Eximbank Hana Financial Group Woori Financial Group Nonghyup Financial Group KB Financial Group JB Financial Group DGB Financial Group BNK Financial Group Shinhan Financial Group Samsung Fire & Marine Insurance SK Securities Hanwha Asset Management Mirae Asset Global Investments DWS Asset Management (Deutsche Bank) KDB Korea Infrastructure Asset Management Company
EP (Equator Principles)	Industrial Bank of Korea Korea Development Bank Hana Bank Woori Bank NH Nonghyup Bank KB Kookmin Bank Samsung Life Insurance Shinhan Bank
UNGC (UN Global Compact)	Hanwha Life Insurance Hyundai Motor Securities Mirae Asset Securities Barings (Mass Mutual)
TNFD (Taskforce on Nature-Related Financials Disclosures)	Shinhan Financial Group Hana Financial Group Woori Financial Group Samsung Fire & Marine Insurance
AIGCC (Asia Investors Group on Climate Change)	National Pension Service Investment Management
PBAF (Partnership for Biodiversity Accounting Financials)	Shinhan Financial Group Hana Financial Group

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