Why Investors Care?

Exploring Climate Risk and Its Potential Financial Impacts with POSCO Holdings

Issue Brief

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Key Takeaways

- Awareness and expectations concerning climate change are increasing among equity and debt investors. Understanding the responsible approach is to manage down the emissions from their portfolios, leading global institutional investors have enhanced engagement with high-emitting companies, intending to align their financed emissions with a 1.5°C trajectory.

- Exclusion is usually seen as the last resort when investors feel there is little possibility of change through engagement with the company. The senior executive management and board of POSCO Holdings will see being named and excluded by foreign institutional investors as serious reputational damage, highlighting their risk management failures.

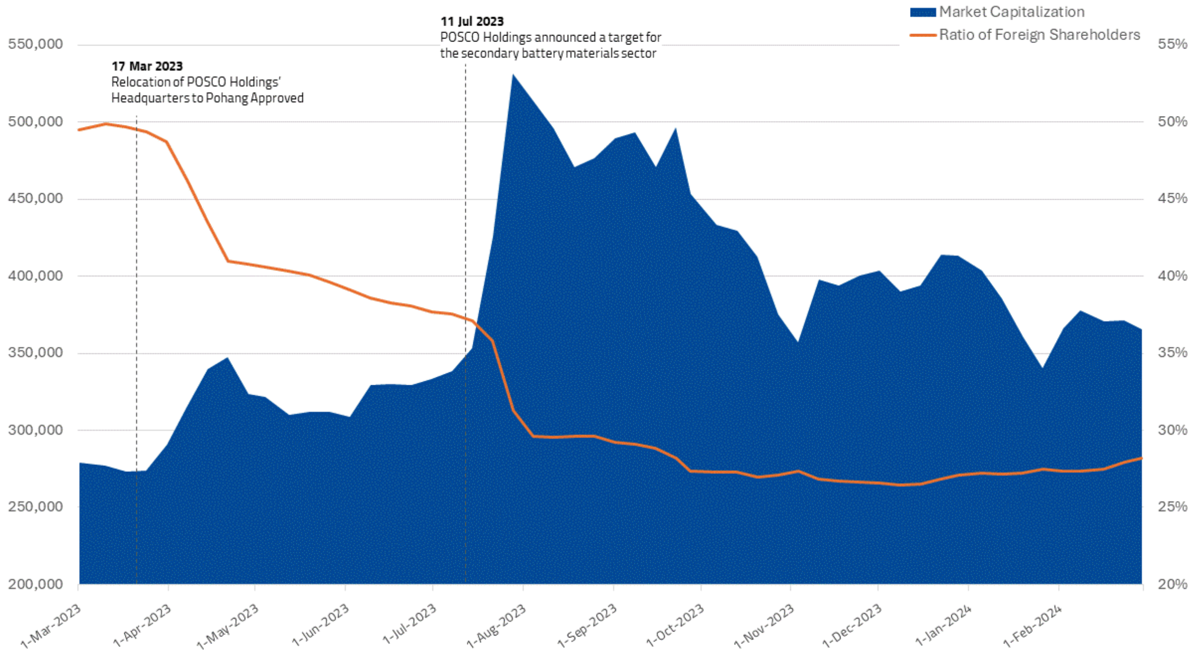
- Between 2022 and 2023, some foreign investors sold shares of POSCO Holdings as they realized profit from the secondary battery materials; others excluded the group for its negative impact on the climate and the environment. For POSCO Holdings, climate-related transition risk driven by tighter regulations in other jurisdictions - including the CBAM and the SFDR in the EU - is becoming a reality.

- Making POSCO Holdings attractive and restoring market confidence will be crucial for the new CEO and board of directors.

1. POSCO Holdings Excluded by Foreign Institutional Investors

Despite the significant net purchase by individual investors, POSCO Holdings has seen a sharp decline in the share of foreign ownership in its stock during the past ten months. Foreign shareholders held 28 percent of shares at the time of writing, a drastic drop from 52 percent in January 2023 (Chart 1). From 2006 to 2022, the ratio was between 53 to 69 percent[1].

Chart 1. The Trend of Foreign Shareholder Raio in POSCO Holdings



Source of Data: CompanyGuide

While foreign and institutional investors' unloading of POSCO Holdings shares may relate to the company's decision to relocate its headquarters[2] and expand the secondary battery materials sector[3], quick desktop research suggests that there may be an additional driver: climate risk.

1 Kim. (2024, February 15). Falling of POSCO Steel, Exiting of Foreign Shareholders. Kyunghyang News | ESG World of Kim Kyung-Sik. Retrieved March 5, 2024, from https://www.khan.co.kr/opinion/column/article/202401112000005

2 Shin. (2023, March 17). Relocation of POSCO Holdings' headquarters to Pohang approved. Korea JoongAng Daily. Retrieved March 5, 2024, from https://koreajoongangdaily.joins.com/2023/03/17/business/industry/Korea-Posco-Holdings-Po-hang/20230317140224743.html

3 Kim. (2023, July 11). POSCO Holdings aims to generate $48 billion in secondary battery material sales by 2030. The Korea Times. Retrieved March 5, 2024, from https://www.koreatimes.co.kr/www/tech/2024/03/129_354727.html

Under its Acceleration to Paris program[4], Dutch-based global leading sustainable asset manager Robeco has pursued enhanced engagement with 200 high emitters lagging in the net-zero transition since late 2021, aiming to accelerate the alignment of its portfolio companies. The recent addition to its February 2024 exclusion list[5] of POSCO Holdings for its "failing climate standards" and its subsidiaries for "having coal power expansion plans", suggests that Robeco did not see the desired changes after a predetermined period of its enhanced engagement.

However, in addition to Robeco, deeper analysis reveals that, between 2022 and 2023, **at least 15 EU-based institutional investors have already excluded POSCO Holdings and/or its subsidiaries due to violation of norms and climate-related concerns (Table 1).**

Table 1. List of Institutional Investors that have excluded POSCO Holdings

Year	Institutional Investor	Reason of Exclusion
2024	Robeco Institutional Asset Management	**Climate Standards Level 2 'Exclusions+'** POSCO Holdings Inc **Coal Power Expansion Plans Additional Level 2 'Exclusions+'** POSCO, POSCO DX Co Ltd, POSCO Future M Co Ltd, POSCO Holdings Inc, POSCO International Corp, POSCO Steeleon Co Ltd
2023	SEB Investment Management	**Verified and Non-Mitigated Breaches against Global Norms** POSCO Holdings Inc, POSCO International Corp
2023	Nordea Asset Management	**Violation of Established Norm** POSCO Holdings Inc
2023	Achmea Investment Management	**UN Global Compact**[6] POSCO, POSCO ADR
2023	Menzis	**Fossil Fuels** POSCO, POSCO Holdings Inc, POSCO International Corp

4 Robeco Institutional Asset Management B.V. (2021, October). Navigating the Climate Transition: Robeco's roadmap to net zero emissions by 2050. Retrieved February 27, 2024, from https://www.robeco.com/files/docm/docu-robeco-roadmap-to-net-zero.pdf

5 Robeco Institutional Asset Management B.V. (2024, February). *Exclusion List.* Retrieved March 17, 2024, from https://www.robeco.com/files/docm/docu-exclusion-list.pdf

6 The United Nations Global Compact is a non-binding United Nations pact to get businesses and firms worldwide to adopt sustainable and socially responsible policies, and to report on their implementation. Its Ten Principles are driven from: the Universal Declaration of Human Rights, the International Labour Organization's Declaration on Fundamental Principles and Rights at Work, the Rio Declaration on Environment and Development, and the United Nations Convention Against Corruption. POSCO Holdings joined UNGC on 4 June 2023.

2023	CB Fonder	**Severe Environmental Damages** POSCO, POSCO International Corp
2023	Pensioenfonds Horeca & Catering	**Fossil Fuel (Climate)** POSCO Future M
2023	DNB Asset Management	**Environment** POSCO, POSCO International Corp
2023	Pensioenfonds van de Metalektro	**Fossil Fuel - Coal** POSCO Holdings Inc, POSCO International Corp
2023	Lærernes Pension	**Violation of Norms** POSCO Holdings Inc, POSCO International Corp
2022	Danske Bank[7]	**Activities Resulting in Significant Negative Impact on the Climate: Fossil Fuels** POSCO Holdings Inc, POSCO Future M **Enhanced Sustainability Standards: Weak Labour Standards, Harmful Environmental Practices, Human Rights Issues** POSCO, POSCO International Corp **UNGC Violation + Lack Processes for Monitoring UNGC/OECD Guidelines: Principal Adverse Impacts** POSCO International Corp **Scope 1 GHG Emissions: Principal Adverse Impacts** POSCO Steeleon Co.
2022	a.s.r. Asset Management	**Global Compact violation** POSCO Holdings Inc
2022	Algebris	**Thermal Coal (Climate)** POSCO Holdings Inc, POSCO International Corp, POSCO Engineering & Construction **Oil & Gas (Climate)** POSCO Holdings Inc, POSCO International Corp
2022	Storebrand Asset Management[8]	**Fossil Fuel (Extra Criteria Q3 2023)** POSCO, POSCO Chemtech Co Ltd, POSCO Holdings Inc **Deforestation** POSCO Holdings Inc **Conduct-based: Human Rights and International Law** POSCO Holdings Inc

7 Excluded in 2022 with reason of exclusion further specified in the 2023 update.
8 Storebrand's exclusion of POSCO can be traced back to Q1 2022. As the exclusion category develops over time, POSCO Holdings and its subsidiaries have been put under different categories. See full exclusion lists: https://www.storebrand.com/sam/international/asset-management/sustainability/our-method/exclusions

2022	NN Group	**Violations of International Standards of Business Conduct** POSCO International Corp.
2022	Equinor Asset Management	**Severe Environmental Damage** POSCO Holdings Inc, POSCO International Corp
2022	Industriens Pension	**Thermal coal extraction** POSCO Holdings Inc, POSCO International Corp
2015	Norges Bank Investment Management[9]	**Severe Environmental Damage** POSCO Holdings Inc, POSCO International Corp
2015	ATP[10]	**Biodiversity** POSCO Holdings Inc

Source: Each institution's website

Ironically, in both 2021 and 2022 Sustainability Reports[11], POSCO Holdings identified "insufficient carbon reduction implementation causing investor exit and increase in financial costs" as a potential market risk. The exclusion by institutional investors should be a critical signal of risk management failures and loss of trust among foreign shareholders. **Making POSCO Holdings attractive and restoring market confidence will be crucial for the new CEO and board of directors.**

2. Climate Risk and Potential Financial Impact

During the past decade, the global financial industry has come to understand that climate **is not exclusively a subset of ESG[12], but an issue with impacts that will affect financial stability and resilience.** In 2015, the Task Force on Climate Related Financial Disclosures (TCFD) was established by the G20 and the Financial Stability Board (FSB), aiming to provide information to investors about what companies are doing to mitigate the risks of climate change.

9 Norges Bank Investment Management first announced its decision to exclude POSCO and POSCO International in 2015. The exclusion list is regularly updated.
10 POSCO Holdings remains on the 2023 exclusion list.
11 POSCO Holdings. (n.d.). Sustainability Report - POSCO HOLDINGS. Retrieved February 27, 2024, from https://www.posco-inc.com:4453/poscoinc/v3/eng/esg/s91e4000400c.jsp
12 Environmental, social, and corporate governance.

Climate-related risk is usually divided into two broad categories, namely ***physical risk*** and ***transition risk***. While the former refers to the physical impacts that result from the changing climate, the latter arises from economic transformation and any dislocation needed to cut emissions drastically.

Due to the lag time between greenhouse gas (GHG) emissions and their effect on the climate[13], the full warming effect of emissions may not be felt for the next few decades. Scenario analyses on climate-related **physical risk**, thus, have been more meaningful in improving contingency planning and the resilience of a company.

Transition risk, on the contrary, is directly tied to emissions scenarios. As large-scale and irreversible changes in the climate system will most likely be correlated with and aggravated by tipping points, the magnitude and nature of the future impacts will be decided by mitigation actions taken today. Thus, tighter government policies and regulations[14] have been the key sources of climate-related transition risk.

As POSCO Holdings has conducted and disclosed the potential physical risk of its main sites based on a scenario analysis, this brief focuses on two types of transition risk - namely market risk and reputational risk - driven by international policy landscapes and market sentiments.

2.1 Market Risk

Climate risk is expected to lead to sector and market-wide repricing of many assets and commodities, including steel. High-quality steel has been the foundation for a wide variety of industries, from buildings, automobiles, and machinery, to home appliances and semiconductors. Decarbonizing steel would greatly contribute to reducing the overall carbon footprint of those industries.

Increased costs to exports. Enhanced disclosure obligations, strengthened emissions

13 Zickfeld, Kirsten & Herrington, Tyler. (2015). The time lag between a carbon dioxide emission and maximum warming increases with the size of the emission. Environmental Research Letters. 10. 10.1088/1748-9326/10/3/031001.

14 Carbon taxes, limiting the free allowances allocated under Emissions Trading Systems (ETS), enhanced disclosures obligations, mandatory shutdown of high-emitting facilities, etc.

limits, and increased carbon pricing across jurisdictions - including the EU Carbon Border Adjustment Mechanism (CBAM) - will soon come into force. If POSCO's production continues to be carbon-intensive and not sufficiently covered by domestic carbon pricing, the company will need to purchase CBAM certificates to compensate for the products' carbon emissions.

Competitive pressure and market prices. The additional costs associated with the CBAM could make POSCO's products more expensive in the EU market when compared to local producers and less valuable compared to premium certified green steel products offered by competitors.

Significant increases in operating and production costs due to higher taxes on GHG emissions and a potential drop in demand for goods will dampen POSCO's profitability, which may lead to decreased stock returns for the shareholders and a potentially lowered credit rating of the holding company.

2.2 Reputational Risk

As leading financial institutions seek to align their portfolios with net-zero outcomes[15] and strengthen their decision-making processes, high-emitting sectors like steel hold both challenges and opportunities for investors. Like other steel giants, POSCO has received special attention from institutional investors over the past few years.

Globally, equity and debt investors' awareness and expectations for climate change are increasing, with financial institutions setting their transition pathways towards carbon neutrality. Some large asset managers have begun incorporating climate change into their decision-making and investment approach to align their portfolios to net zero[16].

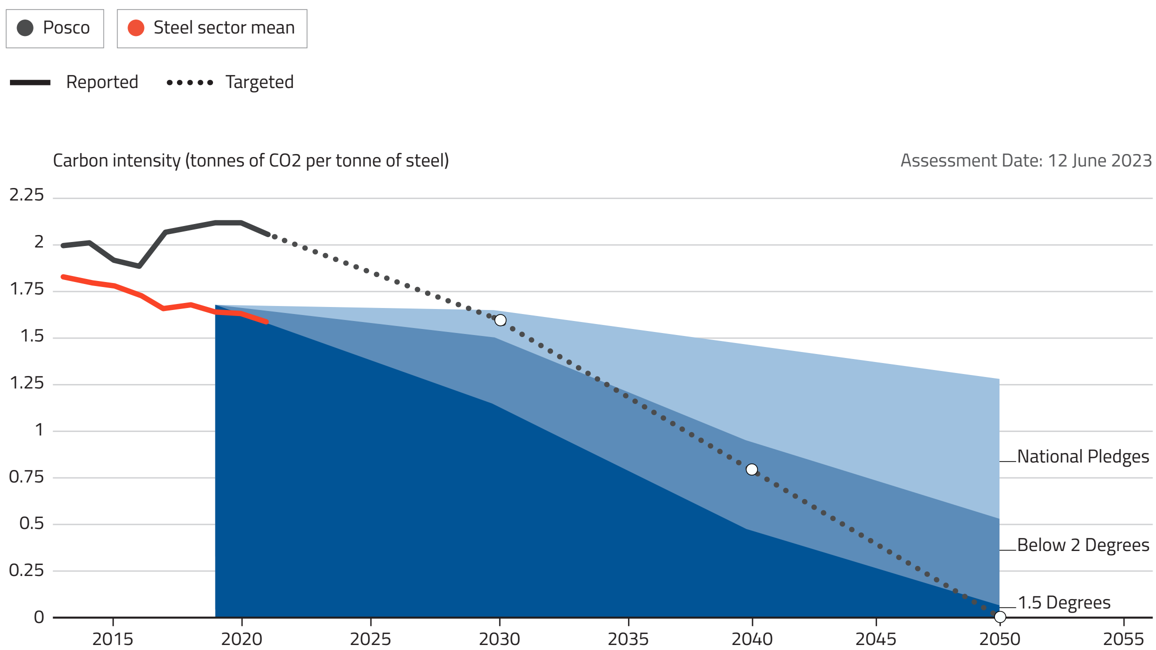
The rollout of the EU Sustainable Finance Disclosure (SFDR) in 2022-2023 may have accelerated the process of financial entities reassessing their investment decisions - including those related to POSCO Holdings and its subsidiaries. Under the new regulation, EU-

15 For instance, absolute GHG emission reductions, carbon intensity reduction, carbon budget, etc.
16 Basel committee on banking supervision: Climate-related risk drivers and their transmission channels, 2021

based financial market participants with more than 500 employees are obliged to "comply or explain" sustainability factors and principal adverse impacts[17] of their investment. Increasingly, climate targets, transition strategies, and progress made by companies in the real economy are affecting their access to capital and debt markets.

So far, POSCO has achieved limited progress in cutting its absolute emissions and emissions intensity. Despite having committed to achieving net-zero emissions by 2050, the company has yet to disclose credible and attainable short-term targets and milestones that would lead to the target[18]. Performance assessments conducted by the Transition Pathway Initiative suggest that POSCO's carbon intensity[19] is high above the steel sector mean and far from aligning with the 1.5°C goal (Chart 2)[20].

Chart 2. Carbon Performance of POSCO



Source: Transition Pathway Initiative

17 Principal Adverse Impacts (or PAI) is a set of metrics that intend to capture negative externalities caused by investments. It contains 14 mandatory and 31 voluntary indicators focusing on environmental and employee matters, respect for human rights, and anti-corruption and anti-bribery matters.
18 POSCO Holdings Inc. | Climate Action 100+. (2023, December 8). Climate Action 100+. https://www.climateaction100.org/company/posco/
19 Tonnes of CO2 per tonne of steel. To compare companies of different sizes, sectoral emissions are normalized by a relevant measure of sectoral activity. However, companies should also disclose their absolute gross GHG emissions.
20 V. (n.d.). Posco - Transition Pathway Initiative. https://www.transitionpathwayinitiative.org/companies/posco#carbon-performance

TPI Notes: The company has set targets to reduce its absolute emissions. To calculate this company's targeted emissions intensity, TPI has assumed that the company's crude steel production grows according to the global growth rate projected in the IEA's Energy Technology Perspectives model Stated Policies scenario (STEPS). When interpreting TPI Carbon Performance data, it is important to bear in mind that climate science shows temperature change is proportional to cumulative absolute CO2 emissions.

Through previous experiences and observations, financial institutions understand that divestment rarely has an influence on a company's cost of capital[21], as it merely reallocates shares from socially responsible investors to more apathetic investors[22]. To ensure that the emissions are reduced in the economy, the most responsible approach for net-zero committed financial institutions is to support an orderly transition[23] by staying engaged and managing down the emissions from carbon-intensive entities in their portfolios rather than passing them to someone else[24].

While responsible investors tend to prioritize engagement and proxy voting in addressing climate change head-on with companies, **divestment and/or exclusion[25] remain the last resort when active ownership has proven unsuccessful and further investment would be incompatible with the investor's own principles.** An interesting case for comparison with POSCO is Nippon Steel – another major steelmaker known to have been under enhanced engagement initiated by several institutional investors, including Robeco[26,27] – which does not appear in this wave of exclusion.

With little doubt, the senior executive management and board of POSCO Holdings will see being named and excluded by foreign institutional investors for violating norms and climate-related concerns as serious reputational damage, highlighting their risk management failures.

21 Plantinga, A., & Scholtens, B. (2020, August 17). The financial impact of fossil fuel divestment. Climate Policy, 21(1), 107–119. https://doi.org/10.1080/14693062.2020.1806020.

22 Linsley-Parrish . (2024, January 19). Divest or Invest? A Climate Change Question. JSTOR Daily. Retrieved February 27, 2024, from https://daily.jstor.org/divest-or-invest-a-climate-change-question/

23 The Network for Greening Financial System (NGFS), which develops climate scenarios used by regulators and others, defines "orderly scenarios" as those with "early, ambitious action to a net-zero CO2 emissions economy," as opposed to "disorderly scenarios" with "action that is late, disruptive, sudden and/or unanticipated". In an orderly transition, both physical and transition climate-related risks are minimized relative to disorderly transitions or scenarios where planned GHG emissions reductions are not achieved.

24 GFANZ. (2022, June). The Managed Phaseout of High-emitting Assets. Retrieved February 27, 2024, from https://assets.bbhub.io/company/sites/63/2022/06/GFANZ_-Managed-Phaseout-of-High-emitting-Assets_June2022.pdf

25 Divestment refers to the selling off existing investments that no longer meet the ethical or other criteria, whereas exclusion is about avoiding certain investments from the outset. Both strategies are used in socially responsible investing to align investment decisions with values or objectives.

26 Investors applaud Nippon Steel, as world's fourth largest steel company takes strides towards green steel . (2023, May 16). ACCR. Retrieved February 27, 2024, from https://shorturl.at/rwxNX

27 Robeco Institutional Asset Management B.V. (2023). Active Ownership Report Q1-2023. Retrieved February 27, 2024, from https://www.robeco.com/files/docm/docu-active-ownership-report-2023-q1.pdf

3. Recommendations: Chance for A Reverse Sweep?

As POSCO Holdings welcomes its new CEO and board of directors, it presents an opportunity for decision-makers of the group to revisit and rethink how their business model fits into a decarbonized economy, revise carbon neutrality roadmaps/transition plans and reduction targets and take appropriate actions accordingly.

3.1 Leadership Commitment and Risk Governance

Successful risk governance usually starts at the highest level – with the board and senior executives. **The responsibility for climate-related risks should be allocated to dedicated senior executives, and board members should be involved in assessing such risks[28].** Furthermore, for climate change and sustainability to be enshrined in a company's culture and core values, expectations regarding climate considerations should be conveyed by senior leadership.

3.2 Close the Credibility Gap

To facilitate a transition towards a decarbonized economy, companies must develop and regularly review their net zero transition plans. **These plans should specifically outline interim targets and actions to enable verification from stakeholders.** A comprehensive and meaningful transition plan[29] will not only help divide the transition pathway into manageable and measurable chunks but will also add credibility and accountability to the net-zero pledge.

» Respond to calls from civil society[30], disclose the phase-out plan for all its domestic and global coal-powered blast furnace facilities, and release a facility-conversion

28 COSO and WBCSD. (2018, October). Applying Enterprise Risk Management to Environmental, Social and Governance-related Risks. Retrieved February 27, 2024, from https://shorturl.at/bsMY6

29 GFANZ defines net zero transition plan as a set of goals, actions, and accountability mechanisms to align an organization's business activities with a pathway to net-zero GHG emissions that delivers real-economy emissions reductions in line with achieving global net zero.

30 [Press Release] Civil society urges POSCO to halt extension of coal-based steelmaking. (2023, October 6). Retrieved February 28, 2024, from https://shorturl.at/pqEMY

plan for the hydrogen reduction process and scrap-based steel-making by electric arc furnace (EAF), at the minimum, in line with POSCO's own Carbon Neutrality Roadmap.

» Key subsidiaries, such as POSCO International, should accelerate aligning their GHG emissions and financial accountings and reflect the updated inventory data by adjusting its Carbon Neutral Basic Roadmap.

3.3 Raise Ambition with Certified Interim Targets

Given that global temperature change is decided by cumulative emissions, **the timing of emissions reductions does matter.** Commitment to work towards certifying a near-term target with the SBTi or other independent parties will allow external stakeholders to verify the group's level of ambition and assess whether meaningful steps are being taken.

3.4 Understand Expectations of Financial Institutions

Financial institutions see the need to collaborate with companies in the real economy to drive decarbonization and contribute to an accelerated, orderly transition to net zero. GFANZ[31], for instance, has put together a list of key transition plan components[32], outlining investors' expectations when evaluating a portfolio company's transition plan and net-zero alignment, as well as tracking progress in implementation.

31 The Glasgow Financial Alliance for Net Zero (GFANZ) is a global coalition of leading financial institutions committed to accelerating the decarbonization of the economy.

32 GFANZ. (2022, September). Expectations for Real-Economy Transition Plans. Retrieved February 27, 2024, from https://assets.bbhub.io/company/sites/63/2022/09/Expectations-for-Real-economy-Transition-Plans-September-2022.pdf

Annex: Corporate Climate Integrity Check

The board is ultimately accountable to shareholders for the long-term stewardship of a company. As the links between climate change and business become increasingly relevant and inextricable, directors are expected to ensure that climate-related risks and opportunities are addressed appropriately.

Various recommendations and guidance notes are readily available to support corporate boards overseeing management of climate-related risks and opportunities[33][34][35]. Summarized below are the most critical questions for directors of POSCO Holdings to bring back to the boardroom. These questions are also relevant to any other companies that would like to review their climate commitments.

Integrating Climate into Corporate Governance

- » To what extent do directors have a robust awareness and understanding of how climate change may affect the group? Do directors feel confident in explaining their decisions as informed by the best available information on climate change?
- » What steps are taken to ensure the board is sufficiently educated with the latest knowledge on climate-related risks and opportunities?
- » How can inside and outside directors play complementary roles to create accountability on climate? Is there effective interaction with relevant members of the executive management concerning climate?
- » How is the remuneration committee ensuring that incentives are aligned with a strategy consistent with the net-zero goals?

33 International Finance Corporation. (2023). Climate Governance: Equipping Corporate Boards to Mitigate Climate Risks and Seize Climate Opportunities. Retrieved February 27, 2024, from https://www.ifc.org/content/dam/ifc/doc/2023-delta/tipsheet-climategovernance-may2023-ext.pdf

34 Climate Governance Initiative, World Economic Forum, & Deloitte. (2023, July). The Chairperson's Guide to Climate Integrity: Earning and Enhancing Trust through the Sustainability Transition. Retrieved February 27, 2024, from https://www3.weforum.org/docs/WEF_Chairpersons_Guide_Climate_Integrity_2023.pdf

35 AIGCC, CERES, IGCC, & IIGCC. (2019, February). Investor Expectations of Steel Companies. Retrieved February 27, 2024, from https://www.aigcc.net/wp-content/uploads/2019/02/Investor-Expectations-Steel-Companies.pdf

Carbon Neutrality Roadmaps/Transition Plan and Interim Targets

- Do the carbon neutrality roadmaps/transition plans of the group and its subsidiaries have clear purposes that authentically align with their values?
- Are the carbon neutrality roadmaps/transition plans evidence-based? Are/will the interim targets be verified and assured by trusted third-party entities and aligned with appropriate frameworks, such as the Science Based Targets initiative (SBTi)?
- Do the carbon neutrality roadmaps/transition plans prioritize reducing and avoiding emissions?
- Do the carbon neutrality roadmaps/transition plans consider the value chain of impacts beyond their operations (i.e., Scope 3 emissions), and alignment with broader socioecologic objectives?
- Are the carbon neutrality roadmaps/transition plans, strategies, and targets regularly reviewed and adjusted?

Strategy and Risk Management

- How aligned are the group's sustainability strategy and core business plan? Is the group actively seeking public funding to support R&D in achieving reduction targets?
- At the strategy level, is the group appropriately balancing immediate financial issues with long-term value creation?
- What are the transition-related scenarios for the group's business, operations, and financial condition in the foreseeable future? What is the strategy for responding to them?
- What are the positions of POSCO Holdings' shareholders concerning managing climate risks?
- What are the reputational risks related to the group's approach to dealing with and communicating climate change? Are subsidiaries' marketing campaigns aligned with the reality of their services and actions?

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Solutions for Our Climate (SFOC) is an independent policy research and advocacy group that aims to make emissions trajectories across Asia compatible with the paris Agreement 1.5°C warming target.