

POSCO plays Blast and loose with its decarbonisation commitment

Hazel Ilango (*), Josephine Richardson

POSCO is South Korea's largest steel manufacturing company, housing the world's two largest integrated steel mills. However, it also holds the distinction of being the nation's largest corporate emitter,[1] primarily due to its reliance on coal-fired blast furnaces for steel production. Therefore, it has a key role to play in the nation's overall decarbonisation strategy.

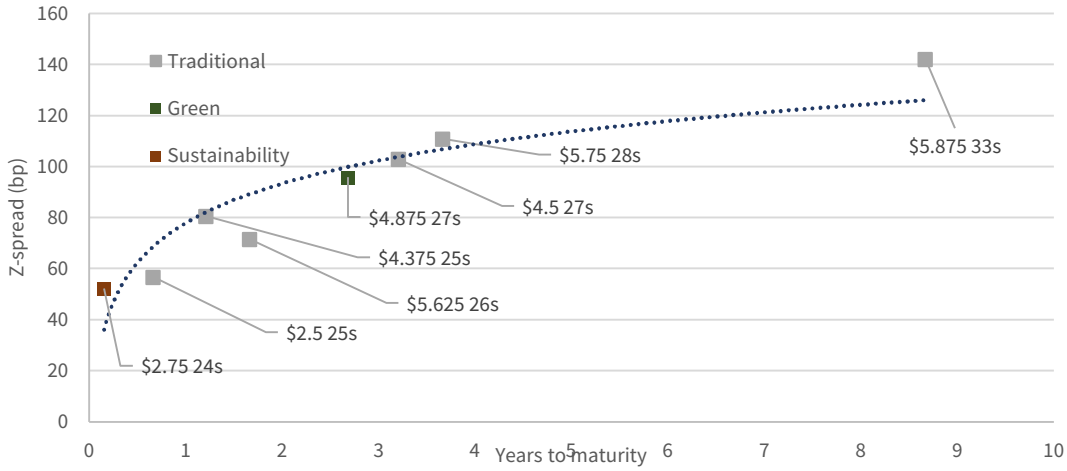
However, **POSCO's own decarbonisation strategy is underwhelming**, as it lacks significant efforts to reduce coal-based production before 2030. Last month, it began work to modernise a blast furnace in Pohang, and has plans to recondition others through a process of relining. This will lock in the use of coal in steelmaking and extend the operational lifespan of the furnaces by about 20 years. This approach is partly driven by POSCO's intention to boost overall production.

Blast furnaces are increasingly seen as financially unsustainable. Hence, POSCO's move to refurbish its blast furnaces coupled with the growing demand for green steel increases the risk of these assets becoming stranded. **Such a development would threaten POSCO's ongoing financial sustainability**, eroding its position among the world's steel heavyweights and increasing investors' exposure.

These risks have become more apparent. **Since 2015, several international institutional investors have added POSCO Holdings and its subsidiaries to their exclusion** lists due to concerns over environmental, climate, and human rights practices. This reduces the universe of potential investors for the company's debt, driving its bond spreads wider.

Given POSCO's current transition trajectory, it is likely to be subjected to increased scrutiny and added to more exclusion lists, which could present negative price risks for investors.

Figure 1. POSCO USD bond spreads. Source: Bloomberg, accessed 20 May 2024.



[1] "South Korea's Biggest Polluters Made Millions From Carbon Sales", Bloomberg, 26 Feb 2024.

Not investment advice. This version 23 May 2024. Important disclaimers at end of the document.
(*) Anthropocene Fixed Income Institute (www.anthropocenefii.org). Author for contacts: hzl@anthropocenefii.org

POSCO background

POSCO (ticker POHANG) is a South Korean integrated steel manufacturing company, ranked seventh in terms of global 2022 production.[2] On 1 March 2022, it was separated into two entities, a holding company named POSCO Holdings Inc, which includes its wholly owned steelmaker named POSCO,[3,4] and other subsidiary entities focused on its alternate business areas.

POSCO is both South Korea's largest steelmaker and its largest corporate emitter.[1] The company's emissions are driven by its use of coal-fired blast furnaces for steel production. These have a poor environmental record compared to Electric Arc Furnaces (EAF), which are one transition route for the steel sector.[5]

POSCO runs two major steel plants in Korea, located in Pohang and Gwangyang. In total, POSCO's steelworks house nine blast furnaces: four in Pohang and five in Gwangyang.

In 2022, POSCO produced 34.22 million tonnes of crude steel. Only 2.8% was made using electric arc furnaces, with most of the remainder produced using the coal-dependent blast furnaces.[6] This compares poorly with Nippon steel and JFE holdings where EAF-produced steel accounts for at least 10% of crude steel production.[7]

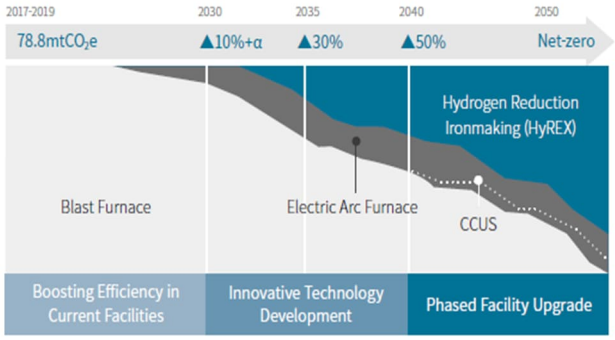
POSCO's decarbonisation strategy

POSCO's decarbonisation strategy is underwhelming when comparing to IEA recommendations.[8]

POSCO targets carbon neutrality by 2050. By 2035 it targets an emissions reduction of 30% compared to a baseline of 78.8 million tonnes, which was the average emissions over the 3-year period between 2017 and 2019.

This decarbonisation trajectory relies on Carbon Capture Use and Storage (CCUS) technology to remove emissions from

Figure 2. POSCOs 2050 Carbon Neutrality Roadmap. Source: POSCO.



[2] "List of steel producers", Wikipedia, accessed 20 May 2024.
[3] POSCO Holdings' business areas include steel, secondary battery materials, lithium and nickel, hydrogen, energy, architecture/infrastructure and agri-bio. POSCO is now an unlisted company on the stock exchange, affiliated with POSCO Holdings. "Growth Vision of POSCO Group and Growth Strategy of Seven Major Core Businesses", POSCO, 8 Mar 2022.
[4] "POSCO Confirms Conversion to Holding Company Structure.", POSCO, 11 Feb 2022.
[5] Please refer to Appendix for further details of decarbonisation strategies for steel production
[6] The Blast Furnace-Basic Oxygen Furnace (BF-BOF) route and the Electric Arc Furnace route (EAF) which uses 105% recycled steel - often referred to as the 'primary' and 'secondary' paths. CO_2 footprint of these two methods are 1.987 and 0.357 tonnes of CO2 per tonne of steel produced respectively. "What is the carbon footprint of steel?", Sustainable Ships, accessed 20 May 2024.
[7] "Operating Steel Capacity by Production Method", Global Energy Monitor, Apr 2024.
[8] "POSCO needs to go green faster to keep up with global shifts", Nikkei Asia, 8 May 2023.

existing production, the development of hydrogen-based steelmaking ("HyRex") to produce green crude steel, and deployment of EAF for steel reuse. Full details are shown in Figure 2.

In February 2024, POSCO started building an EAF at its Gwangyang plant (with production capacity of 2.5 mn tonnes per annum), in alignment with its decarbonisation strategy.[9] This development is expected to replace the output of aging blast furnaces that are set to be shut down.[10]

However, our analysis of its decarbonisation strategy indicates a significant lack of transparency regarding the phase-out of its coal-powered blast furnaces, which is needed to achieve overall lower emissions.

Blast furnace relining

Contrary to its public decarbonisation strategy, it is reported that POSCO plans to reline its blast furnaces, which is a refurbishment process designed to extend the lifespan with limited changes to production methods.

According to Solutions for Our Climate (SFOC) and other sources, POSCO plans to reline two coal-powered blast furnaces at its Pohang (production capacity 5.3mn tonnes per annum), and Gwangyang (3.15mn tonnes per annum) locations,[11] and indeed has recently begun the refurbishment in Pohang.[12] This move extends the lifespan of the world's two largest integrated steel mills, which collectively accounted for roughly 76% of POSCO's scope 1 and scope 2 emissions in 2022.[13]

This relining seems inconsistent with POSCO's stated decarbonisation objectives.

Capital requirements

POSCO has estimated that the cost of transitioning to carbon neutrality will be approximately KRW40trn (around USD 30bn) by 2050.[14]

As of December 2023, it was projected that 7.4% of this amount would be required to construct an EAF at POSCO's Gwangyang plant. The remainder is earmarked for capacity rationalisation, enhancing the efficiency of older facilities to reduce operating costs, and expanding facilities for non-steel businesses.[15]

Separate from this expenditure, it is estimated that POSCO has invested around USD 393mm to reline the blast furnaces in Pohang and Gwangyang.

POSCO's plan to invest in and reline its blast furnaces, which still expected to produce three times the capacity of its upcoming EAF, appears inconsistent with a medium to long-term strategy aimed at reducing its emissions footprint. A summary is shown in Table 1 overleaf.

[9] "POSCO starts construction of electric arc furnace at Gwangyang plant", GMK Center, 7 Feb 2024.
[10] "POSCO to invest $14bn in low-emissions steel production", Nikkei Asia, 23 Sep 2024.
[11] "Coal Tomorrow with POSCO", Solutions for Our Climate (SFOC), Oct 2023.
[12] "POSCO starts modernization of blast furnace No. 4 in Pohang", GMK Center, 30 Apr 2024.
[13] "Asset Exploration", Climate Trace, accessed 15 May 2024.
[14] "Sustainability Report 2022", POSCO, June 2023. Pg 32
[15] "Business Report", POSCO, 29 April 2024. Pg 65

Table 1. Summary of POSCO's EAF and coal re-lining investments. Source: POSCO, Banktrack.

Project	Total Cost of Project ($mm)	Crude Steel Production Capacity (mm tonnes per annum)	In line with 2050 Decarbonisation strategy?
Construction of electric steel production facilities at Gwangyang Works	790	2.50	Yes
Relining: Blast Furnace No. 4 in Pohang	400	5.30	No
Relining: Blast Furnace No. 2 in Gwangyang		3.15	No

Production intentions

POSCO aims to boost its annual steel production to 52 mn tonnes by 2030.[16] This presents challenges to its decarbonisation objective.

Longer term, POSCO will need to scale up low-emissions technologies at a significantly faster rate than it phases down output from its traditional blast furnaces. Although we note, this 2030 production target is within the section described as "Boosting Efficiency in Current Facilities" in Figure 2.

Our interpretation of the production objective is that it confirms POSCO's intention to maintain operations in Pohang and Gwangyang, using metallurgical coal to produce crude steel.

This casts doubt on POSCO's appetite to make a substantial near-term transition.

Summary

POSCOs decarbonisation strategy is underwhelming, as it doesn't meaningfully aim to reduce coal-based production until after 2030.

Its decision to reline blast furnaces locks-in the use of coal for steelmaking and adds approximately 20 more years to these facilities' operational lifespan.[17] It appears to be driven by POSCO's intention to increase overall production.

The capital required to complete this relining is significant, and investors need to be aware that such investment is fundamentally incompatible with POSCO's decarbonisation strategy.

Blast furnaces pose financial risks

It has been reported that the steel industry could face USD 518bn in stranded asset risk because of the ongoing construction of traditional blast furnaces against a backdrop of accelerating decarbonisation.[18]

Relining blast furnaces extends investors' financial exposure to these potentially stranded assets, amid concerns about their long-term financial viability.

Although POSCO aims to reposition itself as a global leader in green steel production, it has yet to demonstrate the commercial feasibility of its proposed HyREX technology. If successful, the

[16] "POSCO to increase steel production to 52 million tons by 2030", 14 July 2023
[17] "Global BOF relining could derail net zero objectives", Argus Media, 27 Jun 2023.
[18] "Global steelmakers face $518bn in stranded asset risk", Financial Times, 21 Jun 2022.

company plans gradually to replace its existing blast furnaces nationwide by 2049. However, this timeline is widely regarded as too protracted and hinges on as-yet unproven technology.[8]

Moreover, the global green steel market is poised to expand at a significant rate of 122.9% through 2030.[19] Its growth may be pushed higher with the introduction of policies such as the EU's Carbon Border Adjustment Mechanism. This points to a growing need for steel manufacturers to establish low-carbon steel supply chains.[20,21,22]

However, for South Korean steelmakers including POSCO to transition from coal-based production to green hydrogen output would require 3.7 million metric tons of hydrogen a year. This would be costly and challenging for POSCO to transition especially given the lack of renewable energy and fossil fuel-based hydrogen may not offer the same competitiveness compared to peers[23].

Broader energy transition challenges in South Korea, which is lagging behind on green hydrogen production and technology, [24] may also force energy-intensive manufacturing operations to consider re-locating. If POSCO is unable to switch to greener processes, it may need to switch locations to source the green energy needed to decarbonise. [25]

Aside from the clear environmental concerns around extending the use of blast furnaces, this presents significant financial risks as well. POSCO's ongoing investment into blast furnaces, its stretched timeline for phasing out these assets, and growing green steel demands all increase exposure for investors.

Rising investor exclusions

Impact of investor exclusions

Exclusions are a popular 'entry-level' sustainable investment strategy, as they are easy to implement and clear to communicate. If an issuer is excluded by a firm, that reduces the total universe of potential investors for that company's debt, and this does lead to a wider cost of capital for debt.[26]

It is therefore important to understand exclusion trends, which could be a driver of potential negative price movements for affected companies' bonds.[27]

[19] "Green Steel Market", Fairfield, Aug 2023.
[20] "Korean steelmakers on alert over initiation of EU carbon border tariff", The Korea Times, 4 Oct 2023.
[21] "Green Steel Demand is Rising Faster Than Production Can Ramp Up", BloombergNEF, 26 Jun 2023.
[22] "Net zero steel in Asia: breaking down barriers and seizing opportunities", Climate Group, 14 Jul 2023.
[23] "Asia must lean harder on its steelmakers to decarbonize", Nikkei Asia, 26 September 2023
[24] "South Korea's lack of green hydrogen may put key industries in a 'precarious situation', warns legislator", Hydrogen Insight, 13 Sep 2023..
[25] "Green Steel Challenges Could Trigger Overseas Push for POSCO", Bloomberg, 24 Sep 2023.
[26] "Does ESG Negative Screening Work?", Eccles, Rajgopal and Xie, SSRN working paper, 11 Aug 2022.
[27] For analysis on other potential exclusions please see "Arctic oil & gas: left out in the cold", AFII, 26 Apr 2023.

Trends of POSCO ownerships

These risks have become more evident in recent years. POSCO Holdings and its subsidiaries have come under scrutiny for their environmental, climate, and human rights practices, prompting a series of divestments by global investors since 2015.[28,29]

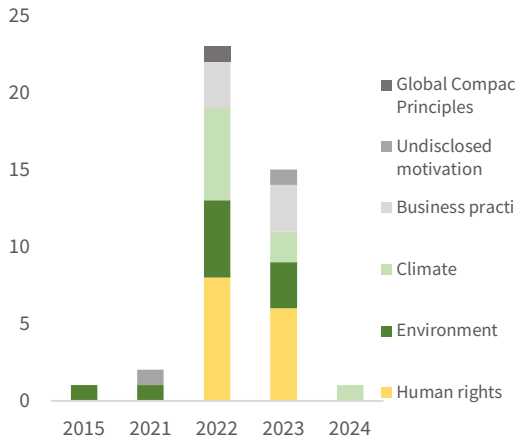
From an equity point of view, POSCO's ownership has changed dramatically. The company's foreign investor base, which usually ranged between 50-60%, fell below 50% in March 2022 and has been steadily declining since.[30] Indeed, following a series of selloffs on Korea's Stock Exchange, foreign ownership of POSCO Holdings dropped significantly to 27.9% as of March 15, 2024, from 49.79% just a year earlier.

This is reported to be due to ongoing climate and labour concerns.[28]

Details of investor exclusions

Figure 3 gives details of investor exclusions detailed in the Financial Exclusion Tracker, a philanthropic initiative (also see Appendix).

Figure 3. Number of investors exclusions by main categories. Source : Financial Exclusion Tracker, SFOC, AFII consolidation.



One telling example is Robeco Institutional Asset Management, which divested from POSCO Holdings for failing to meet its climate criteria (Climate Standards Level 2 'Exclusions+'). Robeco also divested from five other POSCO entities including POSCO, citing its coal power expansion plans.[31]

Closer to home, the National Pension Service (NPS), Korea's largest institutional investor and POSCO Holdings' biggest shareholder, reduced its stake in January 2024.[32] While NPS has faced criticism for weak coal investment restrictions, it's unclear if this stake reduction is due to those restrictions.[33]

Table 2 (overleaf) summarises the exclusion of POSCO Holdings and its affiliated entities by investors who specifically cited climate or fossil fuel concerns.

Many investors have adopted explicit restrictions on funding thermal coal.[34] While metallurgical coal has not historically received as much attention, the table shows there are several investors who are focused on this. This could be extended as concerns on POSCO's decarbonisation plans become clearer.

---

[28] "Foreign investors abandon steelmaker POSCO over climate, labour right fears", Responsible Investor, 26 Mar 2024.
[29] Please refer to Appendix for further details. Note: Some investors have concurrently excluded POSCO in more than one main category.
[30] "Foreign Investors Flee POSCO Holdings Amid Climate Concerns", The Korea Bizwire, 20 Mar 2024.
[31] "Exclusion List", Robeco Institutional Asset Management, Mar 2024.
[32] "NPS lowers stakes in POSCO Holdings, Kakao", The Korea Times, 15 Jan 2024.
[33] "South Korea's Nation Pension Service under pressure over plans to curb coal", Pension and Investments, 12 Aug 2022.
[34] "Indonesian coal mining - where is the funding coming from?", AFII, 29 Aug 2023.

Table 2. List of institutional investors that have excluded POSCO Holdings and/or its subsidiaries for climate or fossil fuel reasons. Source: SFOC, Financial Exclusions Tracker, AFII.

Year	Main Category/ Sub-category I	Sub-category II	Excluded by investor	Companies
2024	Climate / Fossil Fuels	Coal Power Expansion	Robeco Institutional Asset Management	POSCO, POSCO Dx Co, POSCO Future M, POSCO Holdings, POSCO International, POSCO Steelon Co.
2023		Thermal Coal	Pensioenfonds Van De Metalektro	POSCO Holdings Inc, POSCO International Corp
2023		n.a	Pensioenfonds Horeca & Catering (PH&C)	POSCO Chemical
2023		n.a	SPP/Storebrand Sweden	POSCO, POSCO Chemtech Co Ltd, POSCO Holdings Inc
2022		n.a	Menzis	POSCO, POSCO Holdings Inc, POSCO International Corp
2022		Thermal Coal Extraction	Industriens Pension	POSCO Holdings Inc, POSCO International Corp
2022		Activities Resulting in Significant Negative Impact on the Climate: Fossil Fuels, Scope 1 GHG Emissions: Principal Adverse Impacts	Danske Bank	POSCO Holdings Inc, POSCO Future M, POSCO Steelon
2022		n.a	Cardano Group	POSCO Energy
2022		Oil and Gas / Thermal Coal	Algebris	POSCO Holdings, POSCO International, POSCO E&C, POSCO Intern

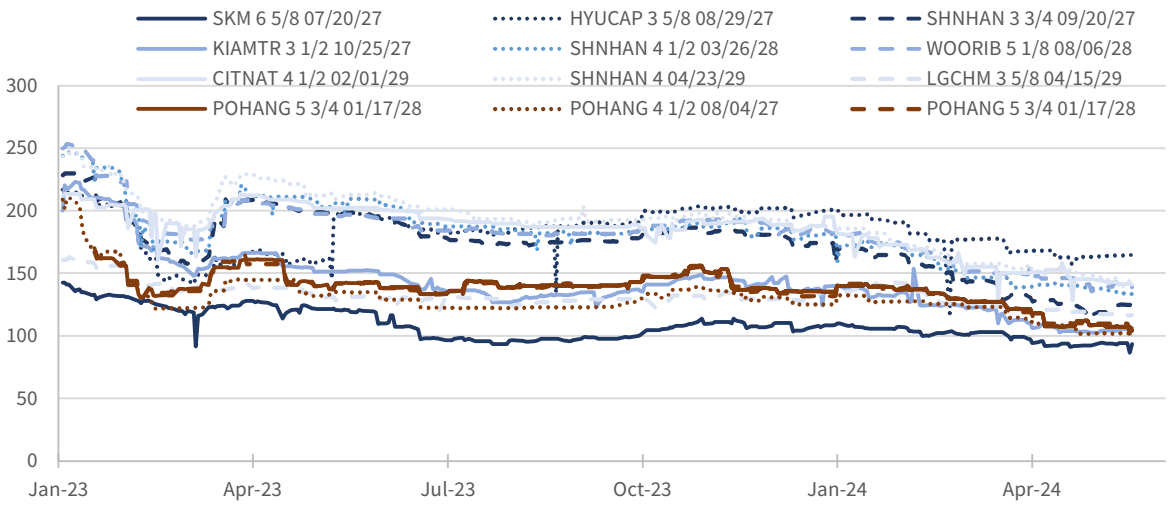
POSCO bond price moves

Figure 4 gives historic bond spreads for POSCO bonds and comparable securities, to analyse if there has been an impact from these exclusions so far. The comparable universe is defined as USD bonds from Korea issuers, with issue dates earlier than Jan 2023, ratings between A- and BBB and maturity between 3 and 5 years. This creates a list of nine securities from seven issuers.

The last 18 months has been a period of overall tightening and spread compression among these securities. In Q1 2023 there was a period of underperformance from POSCO bonds, however since then price moves have been benign, with the POSCO bonds participating in the overall spread compression.

If seems that the market has not yet digested the rising exclusions on POSCO.

Figure 4. POSCO and comparable historic bond spreads. Source: Bloomberg, accessed 22 May 2024.



Summary

Investor exclusions impact funding spreads. There is evidence that foreign investors are divesting from POSCO over climate concerns, and a number of named investors have included POSCO on their exclusion lists explicitly for climate reasons.

The lack of a robust and timely decarbonisation strategy, combined with plans to extend the use of coal-powered blast furnaces, may subject POSCO Holdings and its affiliated entities to increased scrutiny and potential exclusion by more investors.

However, recent price moves by POSCO bonds show little underperformance, suggesting the market is yet to take into account the impact of rising investor exclusions due to climate concerns.

Understanding and anticipating these trends is important for POSCO's fixed income investors.

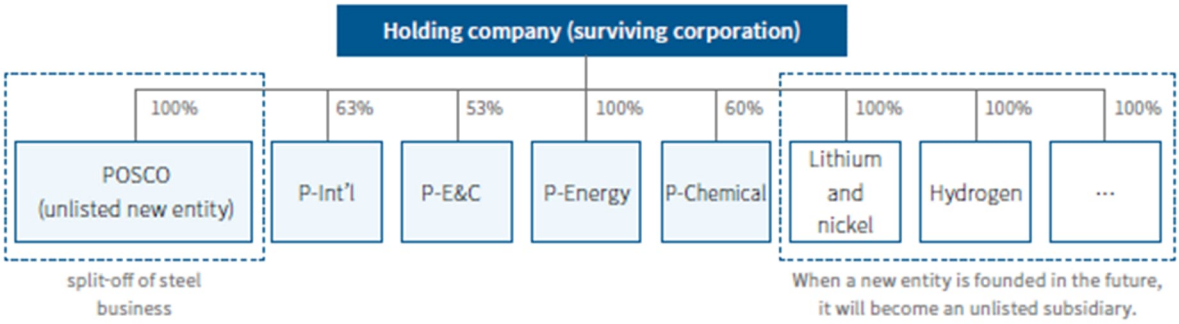
Conclusions

POSCO, the largest steelmaker in South Korea, plays a pivotal role in the country's plan to achieve carbon neutrality by 2050. However, **POSCO's decarbonisation strategy is underwhelming compared to 2030 IEA recommendations, presenting increasing financial risks for fixed income investors.**

- Its decarbonisation strategy is arguably not credible given the lack of transparency around its phase-out plans for coal-powered blast furnaces.
- Its decision to reline blast furnaces locks in the use of coal for steelmaking, extending the facilities' operational lifespan by approximately 20 more years, presenting significant stranded asset risks.
- Investor exclusions are rising due to climate concerns, however this has so far not translated into underperformance. A continuation of this trend could create negative price impacts for POSCO investors.

Appendix

POSCO Holdings corporate structure



Decarbonisation strategies for steel production

Technology	Strategy	Current Outlook	Remarks
Blast Oxygen Furnace (BOF)	Make efficiency improvements to optimise Blast Furnace (BF) - Blast Oxygen Furnace (BOF) operations. This is a coal dependent process.	Technology readily available at competitive cost.	BF-BOF route releases more than four times the CO_2 emissions compared to scrap-EAF.[35]
Carbon Capture and Usage (CCU)	Captures CO_2 emissions and creates new products.	Currently at a pivot stage.	CCUS has a history of underperforming, being capital-intensive, and has faced failure in other sectors.[36,37]
Carbon Capture and Storage (CCS)	Captures and stores CO2 from steelmaking process and releases or injects them as fuel for another process.	Currently at a pivot stage.	
Electric Arc Furnace (EAF)	Maximise secondary flows and recycling rates by melting more scrap in EAF.	Technology readily available at competitive cost.	EAF technology stands out as the sole commercially viable method for producing steel with low emissions and a high recycling rate. It is a well-established steelmaking approach that has been the predominant method for steel production in the United States since 2002.[38]
Direct Reduced Iron (DRI) + EAF using natural gas	Increase usage of DRI in EAF.	Technology readily available.	Still relies on fossil fuels (natural gas) as a reductant. However, it is estimated to produce less than 50% of the CO_2 emissions of a BF.[39]
Direct Reduced Iron (DRI) + EAF using Hydrogen	Replace fossil fuels in DRI process with renewable energy or hydrogen.	Technology readily available at competitive cost.	It represents a technically proven production method that enables nearly emission-free steel production.[40]

[35] "Industrial Decarbonisation in Japan", World Economic Forum, Jun 2023.
[36] "BHP quotes outdated figures as efforts to prop up carbon capture for steel start to get desperate", IEEFA, 15 Dec 2023.
[37] "An Oil Giant Quietly Ditched the World's Biggest Carbon Capture Plant", Bloomberg, 23 Oct 2023.
[38] "Low Carbon Steel Development in Japan", Transition Asia, Nov 2023.
[39] "Enhancing Direct Reduced Iron (DRI) for Use in Electric Steelmaking", Airproducts, accessed 3 Jan 2024.
[40] "Decarbonisation challenge for steel", Mckinsey & Company, Apr 2020.

Investor exclusion details

Table 3. List of institutional Investors that have excluded POSCO Holdings and/or its subsidiaries Source: SFOC, Financial Exclusion Tracker and AFII's reconsolidation. Note: Some investors have concurrently excluded POSCO in more than one main category.

Year	Main category	Excluded by investor
2015	Environment	ATPN
2021	Environment	ATP Group
2021	Undisclosed motivation	Ethias
2022	Business practices	Lærernes Pension
2022	Business practices	NN Group
2022	Business practices	Pensioenfonds Vervoer
2022	Climate	Algebris
2022	Climate	Cardano Group
2022	Climate	Danske Bank
2022	Climate	Industriens Pension
2022	Climate	Menzis
2022	Climate	SPP/Storebrand Sweden
2022	Environment	Danske Bank
2022	Environment	DNB
2022	Environment	Equinor Asset Management
2022	Environment	Norges Bank Investment Management
2022	Environment	Storebrand Asset Management
2022	Global Compact Principles	a.s.r. Asset Management
2022	Human rights	Cardano Group
2022	Human rights	Danske Bank
2022	Human rights	Kommunal Landspensjonskasse (KLP)
2022	Human rights	P+ Pension Fund for Academics
2022	Human rights	Pensioenfonds voor Huisartsen (SPH)
2022	Human rights	Sjunde AP-fonden (AP-7)
2022	Human rights	SPP/Storebrand Sweden
2022	Human rights	Storebrand Asset Management
2022	Product-based exclusion	SPP/Storebrand Sweden
2023	Business practices	Achmea Asset Management
2023	Business practices	Nordea Asset Management
2023	Business practices	SEB Investment Manager
2023	Climate	Pensioenfonds Horeca & Catering (PH&C)
2023	Climate	Pensioenfonds Van De Metalektro
2023	Environment	CB Fonder
2023	Environment	DNB Asset Management
2023	Environment	Government Pension Fund Global (GFPG)
2023	Human rights	Pædagogernes Pensionskasse (PBU)
2023	Human rights	PenSam
2023	Human rights	Pensioenfonds Horeca & Catering (PH&C)
2023	Human rights	Sampension
2023	Human rights	Skandia
2023	Human rights	VGZ
2023	Undisclosed motivation	Swedbank
2024	Climate	Robeco Institutional Asset Management

POSCO bond details

Table 4 shows a list of outstanding POSCO bonds.

Table 4. POSCO outstanding bonds of size greater than $0.1bn. Source: Bloomberg, accessed 20 May 2024.

Description	Issuer	ISIN	Issue Date	Maturity	Currency	Amount Outstanding (bn)	ESG label
POHANG $2.75 24s	POSCO	US693483AE93	15-Jul-19	15-Jul-24	USD	0.500	Sustainability
POHANG $2.5 25s	POSCO	US693483AH25	17-Jan-20	17-Jan-25	USD	0.440	
POHANG $4.375 25s	POSCO	US73730EAA10	04-Aug-22	04-Aug-25	USD	0.700	
POHANG $5.625 26s	POSCO	US73730EAC75	17-Jan-23	17-Jan-26	USD	0.700	
POHANG $4.875 27s	POSCO	US73730EAG89	23-Jan-24	23-Jan-27	USD	0.500	Green
POHANG $4.5 27s	POSCO	US73730EAB92	04-Aug-22	04-Aug-27	USD	0.300	
POHANG $5.75 28s	POSCO	US73730EAD58	17-Jan-23	17-Jan-28	USD	1.000	
POHANG $5.875 33s	POSCO	US73730EAE32	17-Jan-23	17-Jan-33	USD	0.300	
POHANG €0 26s	POSCO HOLDINGS INC	XS2376482423	01-Sep-21	01-Sep-26	EUR	1.066	Green
POHANG KRW1.6 24s	POSCO	KR6005492972	17-Jul-19	17-Jul-24	KRW	130	
POHANG KRW1.8 24s	POSCO	KR6005491B98	16-Sep-21	13-Sep-24	KRW	300	
POHANG KRW1.6 24s	POSCO	KR60054929A9	16-Oct-19	16-Oct-24	KRW	190	
POHANG KRW2.8 25s	POSCO ENERGY CO LTD	KR6063261C11	27-Jan-22	27-Jan-25	KRW	160	
POHANG KRW4 25s	POSCO	KR6421091C74	07-Jul-22	07-Jul-25	KRW	650	
POHANG KRW4 26s	POSCO	KR6421092D15	12-Jan-23	12-Jan-26	KRW	450	
POHANG KRW1.7 26s	POSCO	KR6005493970	17-Jul-19	17-Jul-26	KRW	170	
POHANG KRW2 26s	POSCO	KR6005492B97	16-Sep-21	16-Sep-26	KRW	200	Sustainability
POHANG KRW4 27s	POSCO	KR6421092C73	07-Jul-22	07-Jul-27	KRW	150	
POHANG KRW4.1 28s	POSCO	KR6421093D14	12-Jan-23	12-Jan-28	KRW	200	
POHANG KRW1.7 29s	POSCO	KR60054939A8	16-Oct-19	16-Oct-29	KRW	200	
POHANG KRW4.6 43s	POSCO HOLDINGS INC	KR6005492360	13-Jun-13	13-Jun-43	KRW	200	
POHANG KRW5.2 43s	POSCO ENERGY CO LTD	KR6063264388	29-Aug-13	29-Aug-43	KRW	140	

IMPORTANT DISCLAIMER:

This report is for information and educational purposes only. The Anthropocene Fixed Income Institute ('AFII') does not provide tax, legal, investment or accounting advice. This report is not intended to provide, and should not be relied on for, tax, legal, investment or accounting advice. Nothing in this report is intended as investment advice, as an offer or solicitation of an offer to buy or sell, or as a recommendation, endorsement, or sponsorship of any security, company, or fund.

AFII is not responsible for any investment decision made by you. You are responsible for your own investment research and investment decisions. This report is not meant as a general guide to investing, nor as a source of any specific investment recommendation. Unless attributed to others, any opinions expressed are our current opinions only.

Certain information presented may have been provided by third parties. AFII believes that such third-party information is reliable, and has checked public records to verify it wherever possible, but does not guarantee its accuracy, timeliness or completeness; and it is subject to change without notice.

Any reference to a company's creditworthiness or likelihood of positive or negative performance in the current or future market is purely observational and should not be taken as a recommendation or endorsement or critique of such company or security.

AFII is a non-profit organisation "to monitor, advocate for and influence the impact of the fixed income and bond markets in the age of human induced climate change". For more information about the Institute, please visit www.anthropocenefii.org.

AFII is not in any way associated with, nor are any of its directors, employees or advisors, any of the companies it references in its materials or reports and is not receiving compensation or consideration of any nature for its observations and/or insights.

