Asia Investor Group on Climate Change (AIGCC)

Memorandum on the Transformation of the Steel Sector in Asia

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AIGCC
ASIA INVESTOR GROUP ON CLIMATE CHANGE

Climate Action 100+
Global Investors Driving Business Transition

A summary of discussions from a multi-stakeholder roundtable held in Tokyo on 3rd October 2023.

The Asia Investor Group on Climate Change convened a multi-stakeholder, Chatham-House roundtable with the support of peer networks in October. It signalled the start of one of the Climate Action 100+ sectoral focus for industries in Asia, as the initiative progresses to its next phase. The steel sector is responsible for over 7% of global energy sector CO2 emissions and is a key enabler for accelerated transition along the value chain, signifying huge potential as an industry to decarbonise and to create lasting contributions to a net zero emissions economy.

CONTEXT SETTING

The responsibility to accelerate steel decarbonisation is a group effort and the industry has the potential to adopt transformative long-term net zero solutions. Meanwhile, steel purchasers are well positioned to create the demand for green steel, in part to achieve their own net zero goals. Policymakers responsible for creating clear and consistent policy that provides investment certainty, can use tools including carbon pricing to create incentives for their markets to be competitive in the production of green steel. Investors can advocate for the greening of the entire supply chain and engage steelmakers for accountability towards credible transition plans. As long-term climate solutions emerge, it is for financiers to ensure that high-emitting processes on track to be phased out should not be locked in. Asian steelmakers are therefore at crossroads to critically evaluate and limit the locking in of greenhouse gas emissions with carbon-intensive technologies.

The conversation was conducted on the premise that there is not a single pathway to net zero steel in Asia, and that cross-sectoral collaboration will accelerate transition. In particular, whilst acknowledging the young blast furnace fleet in most Asian markets, it is also understood that a majority of the direct emissions from the current Blast Furnace-Basic Oxygen Furnace (BF-BOF) route are attributed to emissions generated from the early-stage ironmaking process. Scrap-EAF route releases the least amount of GHG emissions and ultimately the DRI-EAF route which was explored further in the discussion could have zero emissions if green hydrogen and renewable energy were used. This signals the requirement for a significant amount of renewable energy.

The multi-stakeholder conversation calls for ambition amongst all participants to take a long-term view to create an environment of certainty to overcome existing technological and financing barriers for Asian steelmakers. There is an understanding that the potential of different technologies for net zero steel are at varying levels of technological readiness, and as such being deployed differently by steelmakers under

different market-specific constraints. Increased certainty on technology, policy signals, peer collaboration and supply of commodities along the value chain will help define timeframes for net zero steel production.

INSIGHTS FROM PARTICIPANTS

Creating enabling environments for a structured transformation of the steel sector in Asia

- **Early closure of blast furnaces requires justification from a cost-benefit perspective** where young blast furnaces are involved. The implicit need for a planned and controlled transition with consideration of the lifetime of existing blast furnaces will be impacted by the readiness of technologies involving the use of hydrogen at different parts of the steelmaking process, and ultimately the costs of hydrogen reduction.
- **For most markets, steelmakers will need to consider collaborations with other markets that have abundant renewable energy resources,** to move some of the most energy-intensive processes closer to sources of green hydrogen.
- **Some steelmakers benefit from capacity within the market to produce green hydrogen locally**, thus enjoying minimised costs of transportation.
- **Ultimately, mutual development with growth markets and bolstering efforts in the development of a green steel value chain** are additional factors by steelmakers considering collaboration with other markets.

Overcoming technological barriers for technologies at different readiness levels

- **Adoption of technologies at earlier Technology Readiness Level (TRL) stages can in theory be overcome with time**, but there are challenges with commercial viability and inertia towards existing technologies with high productivity rates and stable quality.
- **Uncertainties from the quality of steel produced using newer technologies will need to be overcome for specific products**, in particular, for auto manufacturers and materials for batteries used within electric vehicles.
- **Investors call for increased transparency and disclosure on the viability of technologies at different TRLs,** including the use of carbon capture and sequestration, given limited insight into the risk and cost competitiveness of certain solutions as a technology for the transition.
- **Investors also call for a clearer, time-bound, comprehensive definition of transition technologies for steel by steelmakers**, to ensure that it is consistently integrated into discussions, facilitating a shared understanding and effective decision-making.

Accelerated transition through peer-to-peer and/or sectoral collaboration

- **Peer collaboration and the exchange of technological know-how across markets** to overcome challenges with the scaling up of emerging technologies through partnerships with peer companies was also an evident path forward towards decarbonizing the steel industry in Asia.
- **Extending the life cycle of by-products from steelmaking through recycling** as demonstrated by the case of encapsulating emitted by-product gas from steelmaking for the petrochemical sector created an opportunity for cross-sectoral collaboration between sectors to sequester emissions.
- **Investors called for cross-industrial dialogue with the utility sector to manage the anticipated increase of demand on the power sector** resulting from the likely adoption of electric arc furnaces over time.

Creating certainty in policy signals

- **Investors called for policies to enable cross-border trading of scrap steel** as a commodity to incentivise green steel production through scrap-EAF route and to reduce uncertainty in technological development.
- **Investors called for stronger carbon pricing signals to factor in the embedded cost for fossil fuels** and to better project the costs of carbon by 2050, to justify considerations when lengthening the use of existing technologies which generate high levels of direct emissions.
- **There was consensus that green procurement policies featuring more structured demand and commitment from steel purchasers could ultimately increase affordability of green steel** in the future tailored for a greater variety of products. Market-specific examples were cited to create a surge in the demand for green steel through mandated funds for innovation.

Way Forward

The insights gained from this discussion lay the groundwork to inform future investor and corporate action across pillars of technology, value chain, policy engagement and financing.

Transition can be accelerated through more opportunities for knowledge transfer amongst steelmakers. Additionally, the inherent differences across Asian markets in terms of the demand for steel and local capabilities to reduce emissions at source calls for further market-level deliberations. Such forums will be complemented with continued Climate Action 100+ sector engagements, with an aim to overcome barriers and capitalise on opportunities available in the transformation of the steel sector.

Acknowledgements

We would like to express our **gratitude to all participants and observers to the roundtable** for their participation in person, which has made possible the critical convening conversation amongst Asian steelmakers about key considerations to support the transformation of the steel sector in Asia for an accelerated transition to net zero.

Amongst those who are willing to be named, we would like to thank **the senior executive directors and heads of division** from steel manufacturers representing four key markets in Asia, including: Baoshan Iron & Steel Co., Ltd, China Steel Corporation, and POSCO.

We would also like to thank **investors** including California State Teachers' Retirement System, Cathay Life Insurance, Columbia Threadneedle Investments, DSP Asset Managers, EOS at Federated Hermes, Fidelity International, and Sumitomo Mitsui Trust Asset Management.

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About AIGCC and CA100+

ABOUT AIGCC

The Asia Investor Group on Climate Change (AIGCC) is an initiative to create awareness and encourage action among Asia's asset owners and financial institutions about the risks and opportunities associated with climate change and low carbon investing. AIGCC provides capacity and a trusted forum for investors active in Asia to share best practice and to collaborate on investment activity, credit analysis, risk management, engagement and policy related to climate change.

With a strong international profile, the AIGCC network also engages with government pension and sovereign wealth funds, family offices, and endowments, AIGCC represents the Asian investor perspective in the evolving global discussions on climate change and the transition to a net zero emissions economy.

ABOUT CLIMATE ACTION 100+

Climate Action 100+ is the world's largest investor engagement initiative on climate change. It involves 700 investors, responsible for over $68 trillion in assets under management. Investors are focused on ensuring 170 of the world's biggest corporate greenhouse gas (GHG) emitters take the necessary actions to align their business strategies with the goals of the Paris Agreement. This includes improving corporate governance of climate change, reducing GHG emissions, and strengthening climate-related financial disclosures.

Launched in 2017, Climate Action 100+ is coordinated by five investor networks: Asia Investor Group on Climate Change (AIGCC); Ceres (Ceres); Investor Group on Climate Change (IGCC); Institutional Investors Group on Climate Change (IIGCC) and Principles for Responsible Investment (PRI). Climate Action 100+ has launched its next phase to inspire greater corporate climate action in this critical decade. Learn more here.

APPENDIX

AGENDA

Part I: Participants were asked to share views on supportive regulatory frameworks to strengthen and accelerate the development of H2 DRI technologies in Asia. This will include discussions on current bottlenecks and associated capital costs, and relevant financing levers.

Guiding Questions:

1.1) To consider active transition to long-term net zero solutions which reduce GHG emissions at source and reduce future reliance on fossil fuels, there are various options in lifetime extensions of blast furnaces, ranging from minimal investment for shorter lifetime extension to a full relining process. What are the parameters used by steelmakers to consider whether a technology is intended for transition? What are the prospects of phasing out of existing blast furnaces to minimise locking in of high emissions, without a pre-mature shutdown of blast furnaces?

1.2) Injection of hydrogen into blast furnace (fossil-based reductants) (TRL 7 – ready by 2025) and the deployment of a hydrogen DRI technology (TRL 5 – ready in 2030s) are both hydrogen-based ironmaking processes which require the use of H2 in different parts of the process. Considering different TRLs of H2 injection into BFs vs. H2 DRI, what is the economic case for importing H2 and embodied H2 (green iron) respectively, vs. producing them domestically? What are the challenges unique to your respective markets?

1.3) What are the challenges and opportunities unique to your market in pivoting towards a H2-based steelmaking process, from the perspectives of emissions reduction, costs, and availability of feedstock / raw materials? In Asian steelmakers' mission to accelerate the transition to low-carbon steelmaking, are there any ways to overcome or circumvent these issues? What are the timeframes or pre-requisites of these measures?

1.4) In view of anticipated application of carbon prices which would impact high-emission processes, the policy approach varies across markets but ultimately will impact processes that are slow to transition to long-term net zero processes. What are the investors' and consumers' expectations for both policymakers and steelmakers in their readiness to transition? What are the expectations of steelmakers in demonstrating their strategic overview of the impact from carbon prices, and/or what milestone progress is expected of steelmakers as they transition to net zero?

Part II: Participants were asked to share views on Asian markets' competitive advantages and opportunities, overall ecosystems' barriers, and challenges for green steel, and to identify conducive policy and financing incentives.

Guiding Questions:

2.1) To consider active transition to long-term net zero solutions which reduce GHG emissions at source and reduce future reliance on fossil fuels, there are various options in lifetime extensions of blast furnaces, ranging from minimal investment for shorter lifetime extension to a full relining process. What are the parameters used by steelmakers to consider whether a technology is intended for transition? What are the prospects of phasing out of existing blast furnaces to minimise locking in of high emissions, without a pre-mature shutdown of blast furnaces?

2.2) In terms of financing / co-investment opportunities and creating an enabling environment for the trade of future products and transition materials, what forms of regulatory support might be useful to consider? This could range from support to enable the cross-border flow of know-how and technologies to enable a just transition in the international division of labour along the steel value chain. What incentives have been working well in different markets to drive innovation in technologies for transition?

2.3) To crystalise incentives and opportunities in the bilateral trading of materials with support from robust regulatory frameworks to green the steel supply chain, what are the specific policies you consider to be the most relevant for your market? Are there specific asks from the demand side / steel purchasers? This could range from different processes across the value chain, namely:

2.3.1) upstream: clean energy and raw material infrastructure
2.3.2) midstream: climate-friendly production processes
2.3.3) downstream: climate-friendly end products