standard chartered

Low carbon steel

An emerging corridor of opportunity between the Middle East and Europe?

Transition Finance Insight

Steel is a critical enabler of economic development. It's also used in nearly every low carbon technology needed to support the transition, including wind turbines, solar infrastructure, and electric vehicles. Yet, traditional steelmaking is a carbon-intensive industrial process, responsible for 7–8% of global CO_2 emissions, making it the largest industrial source of emissions globally.

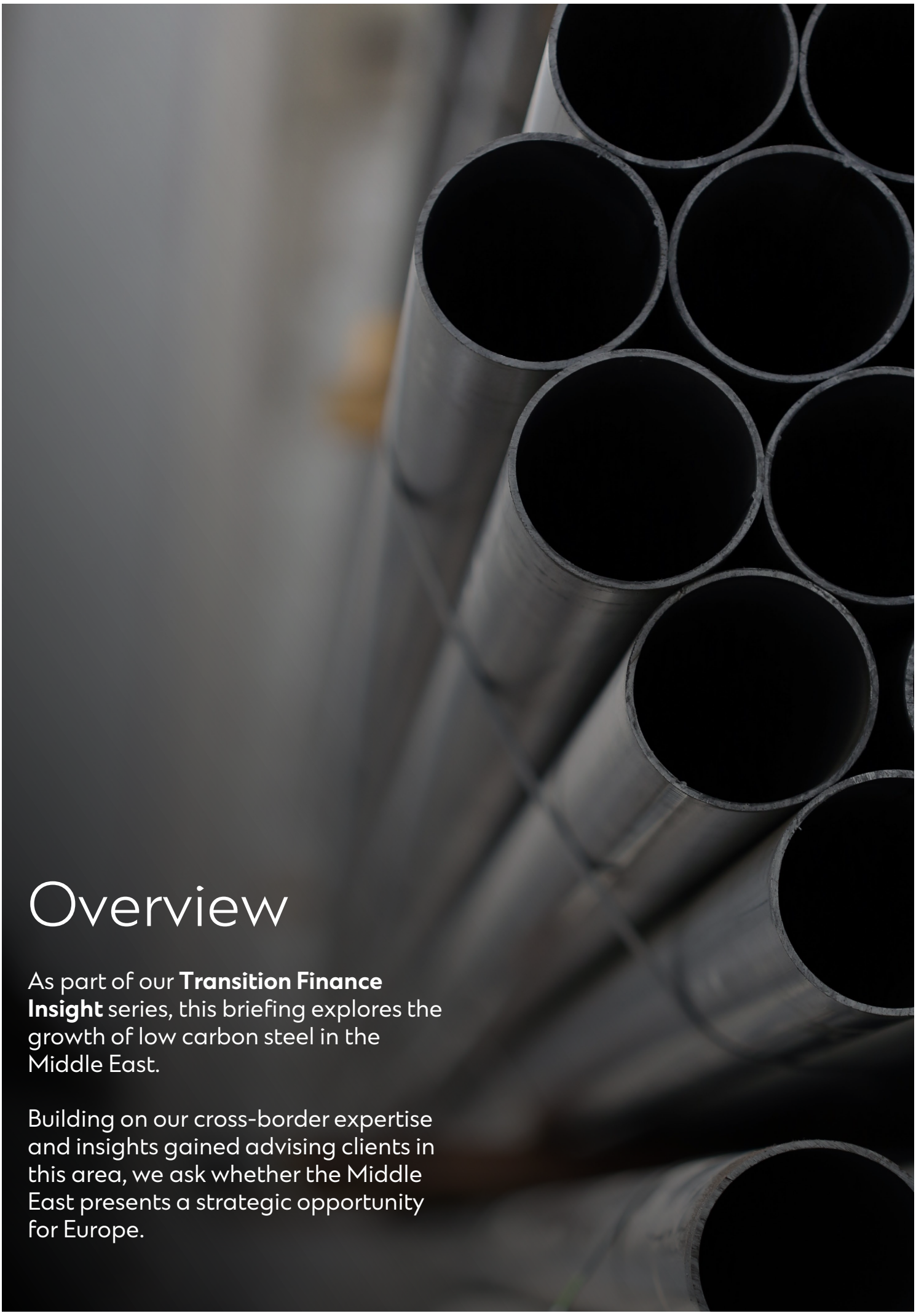
With global demand for steel expected to grow over the next decade, this dynamic presents a unique set of challenges across the steel sector as companies seek a pathway to support decarbonisation, while meeting this demand.

Our latest **Transition Finance Insight** looks at the ways in which this dynamic is unfolding across Europe and the Middle East, specifically across the Gulf markets of Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE).

In this article, we share our views on the emergence of a cross-regional low carbon steel corridor and outline the opportunity we see through this new value chain to help accelerate low carbon growth across both Europe and the Middle East.

Ben Daly

Managing Director and Global Head, Transition Finance



Overview

As part of our **Transition Finance Insight** series, this briefing explores the growth of low carbon steel in the Middle East.

Building on our cross-border expertise and insights gained advising clients in this area, we ask whether the Middle East presents a strategic opportunity for Europe.

The market today

According to the World Economic Forum (WEF), by 2050, steel demand will increase by around 30 per cent. Achieving this demand, while facilitating a reduction in carbon emissions from steel, requires not only significant capital - some USD300 billion on top of business as usual - but supportive and consistent policy mechanisms, alongside consumer demand for low carbon steel.

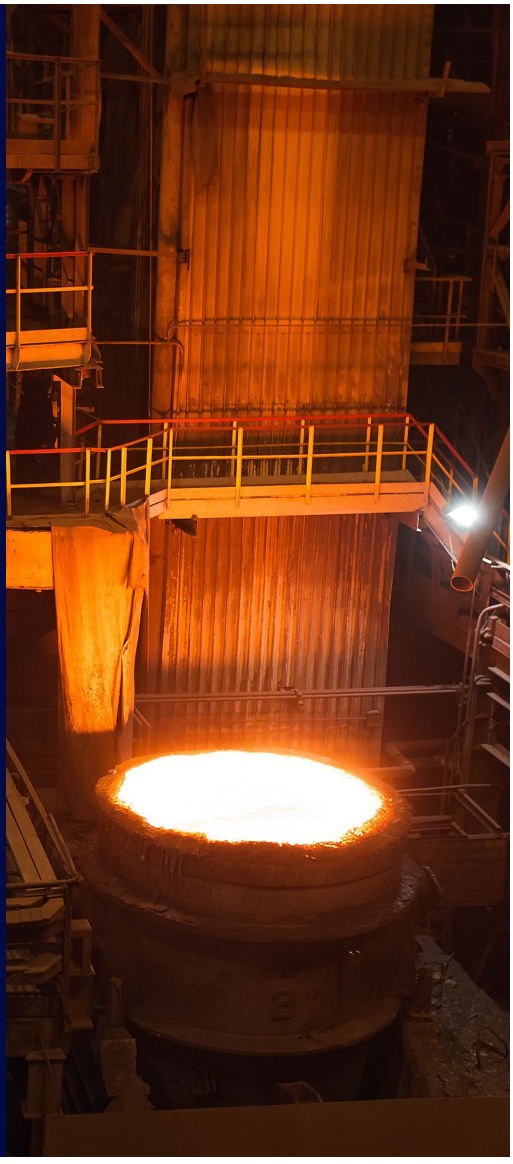
Europe, a mature steel market, relies on aging and predominantly blast-furnace steel production infrastructure, nearing the end of its lifespan. When these furnaces reach the end of their operational life, Europe has the opportunity to switch to Electric Arc Furnaces (EAFs). This shift will help to reduce carbon emissions in steel production by up to 80 per cent when compared to traditional blast furnaces, primarily because EAFs rely on electricity and scrap metal instead of coking coal. In addition, Europe has started to develop hydrogen fueled Direct Reduced Iron (DRI) plants alongside EAFs, where energy cost and regulatory support allows.

The Middle East, on the other hand, has significant incumbent DRI-EAF infrastructure, and a growing domestic demand for low carbon steel, as markets seek to diversify into downstream industries. Across the region, capital and attractive fiscal incentives are helping to create a natural centre of gravity for low carbon steel production.

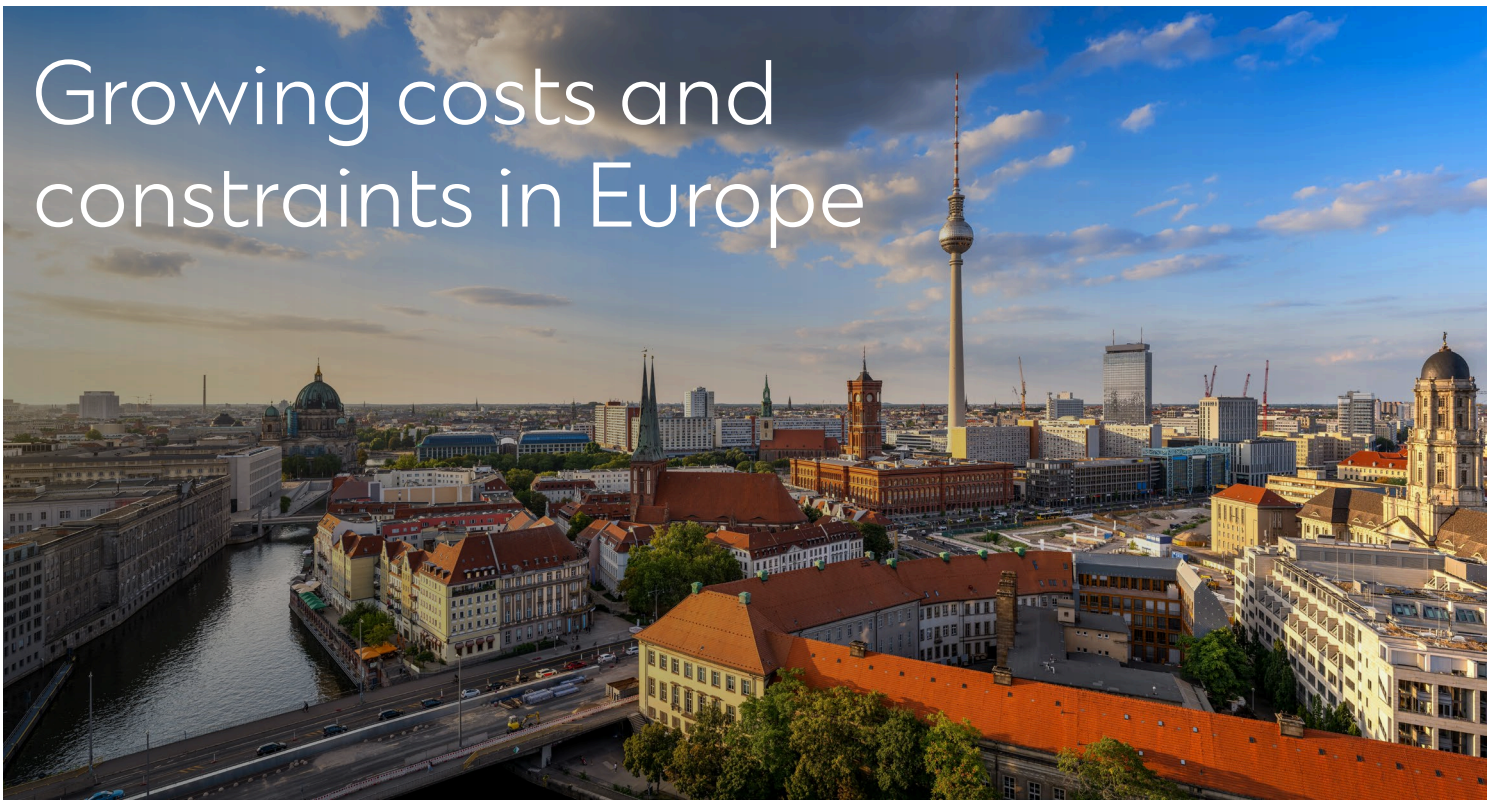
Advanced low carbon steel technologies

The most commercially viable route to lower emission steel is produced using the direct reduced iron – electric arc furnace route (DRI-EAF).

1. **Direct Reduced Iron (DRI):** DRI is a metallic material produced by removing oxygen from iron ore - and is a feedstock for steelmaking. Most notably, DRI, alongside scrap steel, are key inputs into the EAF. The process of making DRI utilises natural gas, instead of coal as an energy source, and as a result, this is a key technology for decarbonising primary steel production.
2. **Electric Arc Furnaces (EAF):** EAFs are industrial furnaces that use an electric arc powered by electricity to melt scrap metal for steel production, replacing traditional coal blast furnaces. When powered by renewable energy, this lowers the emissions of finished steel.
3. **Further advancement:** Green hydrogen, produced using renewable energy, can be used as a reducing agent in DRI plants, emitting only water vapor instead of CO_2. Currently, however, there are challenges with economic viability.



Growing costs and constraints in Europe



Today, Europe faces escalating costs and more complex regulatory constraints. There are two core challenges:

Increasing tariffs

The EU Carbon Border Adjustment Mechanism (CBAM) has introduced a carbon tariff on carbon intensive products like steel. At the same time, the EU Emissions Trading System (EU ETS) is gradually phasing out the free allowances it provided to the steel sector.

This means that by 2030, nearly all primary steel consumed within the European Union could be subject to the full price of tariffs, regardless of origin.

Rising costs

At the same time, the cost of electricity – which is critical to EAFs and therefore the production of low carbon steel – has risen sharply. The cost of modernising Europe's blast furnace fleet would also require billions in investment.

The EU Emissions Trading System (ETS) and steel production

Established in 2005, the EU ETS was designed to reduce greenhouse gas emissions across energy-intensive sectors. It sets a limit on total emissions and allowed companies to buy and sell allowances based on their needs.

Steel producers have traditionally received a significant share of their carbon allowances for free to prevent 'carbon leakage' - the risk that companies relocate to regions with weaker climate regulations. But, as the EU has tightened climate targets and regulation, it has gradually reduced free allocations for steel.

This dynamic could lead to a shortfall in credible low carbon feedstock (the raw materials that are processed to create liquid steel or semi-finished steel products). As a result, Europe could risk accelerated de-industrialisation as investments across the steel sector migrate to markets offering more competitively priced steel, with lower emissions.

The Middle East's low carbon steel springboard

While Europe wrestles with carbon constraints, the Middle East benefits from a robust volume of renewable and natural gas resources, which can directly power EAFs, and therefore, low carbon steel production. The region also accounts for roughly 40 per cent of global DRI production.

Some governments across the region have already supported large scale hydrogen ready, low carbon steel complexes within special economic zones.

The Gulf region could take advantage of the emerging demand for low carbon steel, given the structural cost advantages. The region also has the potential to further reduce emissions by introducing green hydrogen as a fuel source for low carbon steel production, once it has achieved a more commercially viable cost.

The emerging Middle East – Europe low carbon steel corridor

Europe's headwinds alongside tailwinds in the Middle East, point towards a split supply chain that could benefit both regions. This underscores an opportunity for cross-border collaboration.

Low carbon feedstock is produced in Middle Eastern hubs.

The reduction of iron ore to produce Direct Reduced Iron (DRI) - a feedstock for steelmaking that bypasses the traditional coal blast furnace route - could be carried out in Middle Eastern hubs.

This feedstock is then shipped to Europe.

This DRI - in a compacted form called hot briquetted iron - could then be shipped to electric arc furnaces (EAFs) in Europe.

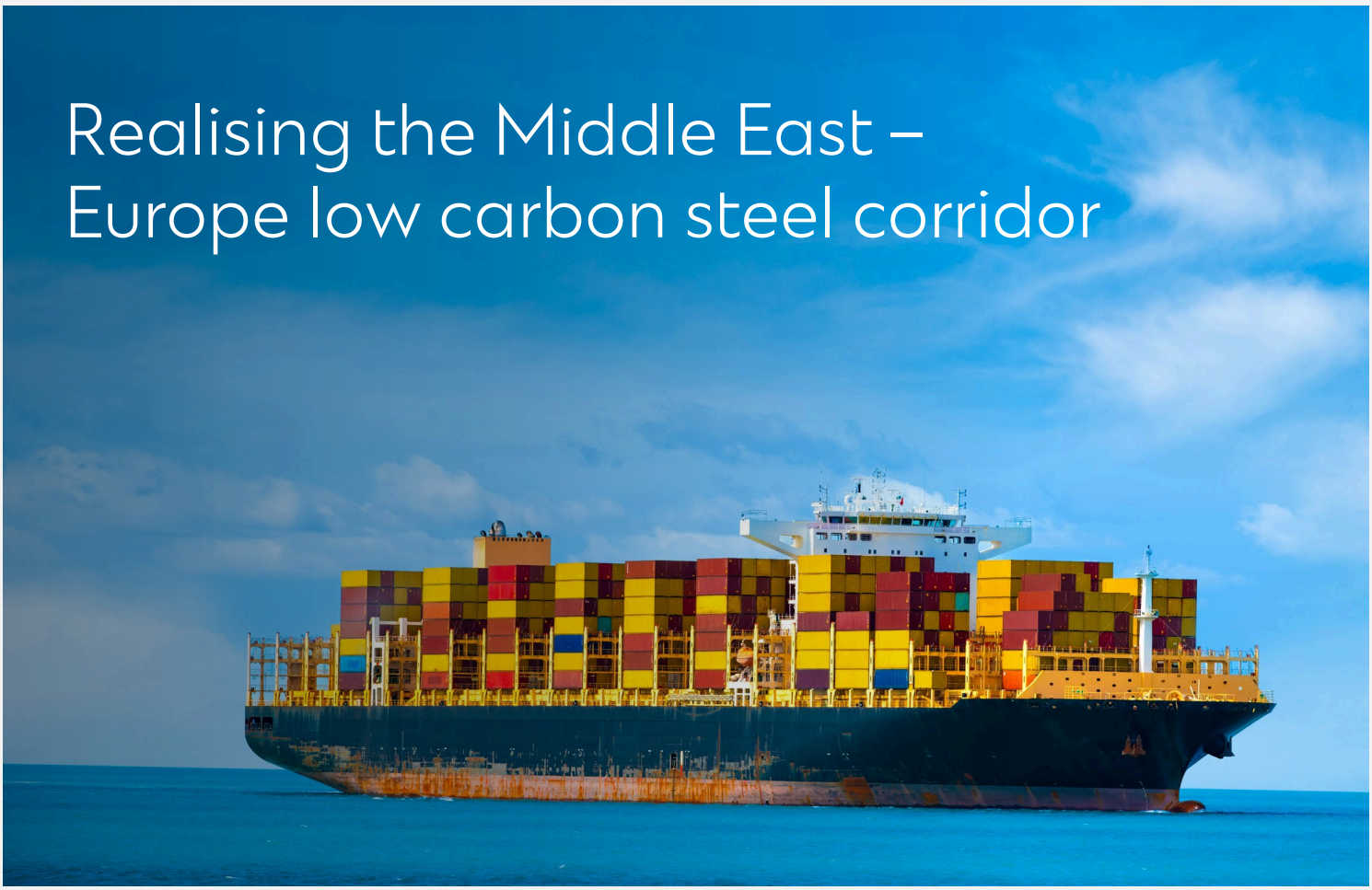
And used to produce low carbon steel in Europe.

EAFs in Europe are then used to produce low carbon steel in Europe directly.

By importing DRI (as hot briquetted iron) produced with renewable electricity, and complemented by carbon capture, European steelmakers have the potential to reduce onsite emissions by more than 80 per cent when compared to the typical blast furnace route.

- **This dynamic is mutually beneficial:** Europe's demand for low carbon steel is aligned with the Gulf's ability to produce low carbon, cost effective feedstock for steel production. As such, this corridor supports industrial transformation, helps Europe to meet its decarbonisation ambitions, and positions the Gulf as a competitive player in this space.
- **The model is moving from theory to practice**: Vale has signed a Memorandum of Understanding (MOU) with European steelmakers to explore the long-term supply of low carbon hot briquetted iron. The agreement will aim to evaluate the construction of plants to produce DRI and other lower-carbon footprint products.

Realising the Middle East – Europe low carbon steel corridor



A cross-regional low carbon iron and steel corridor could help to accelerate low carbon growth across both Europe and the Middle East. Realising this value chain requires collaboration across Governments, iron and steel producers, financial service providers and end consumers.

Institutions with established franchises across the Middle East and Europe, like Standard Chartered, are well placed to provide the necessary connective tissue to facilitate a cross-regional value chain for low carbon steel. Our global network across high-growth markets and experience in aligning international capital with transition assets make us a natural intermediary to support a Middle East – Europe low carbon steel corridor.

Catriona Bell
Director, Transition Finance
and low carbon steel expert

Disclaimer

Forward-looking statements

The information included in this document may contain 'forward-looking statements' based upon current expectations or beliefs as well as statements formulated with assumptions about future events. Forward-looking statements include, without limitation, projections, estimates, commitments, plans, approaches, ambitions and targets (including, without limitation, ESG commitments, ambitions and targets). Forward-looking statements often use words such as 'may', 'could', 'will', 'expect', 'intend', 'estimate', 'anticipate', 'believe', 'plan', 'seek', 'aim', 'continue' or other words of similar meaning to any of the foregoing. Forward-looking statements may also (or additionally) be identified by the fact that they do not relate only to historical or current facts.

By their very nature, forward-looking statements are subject to known and unknown risks and uncertainties and other factors that could cause actual results, and the Group's plans and objectives, to differ materially from those expressed or implied in the forward-looking statements. Readers should not place reliance on, and are cautioned about relying on, any forward-looking statements. In particular, there is additional uncertainty around the evolution, impact and risk surrounding climate change that cannot be evaluated in the same way as more conventional financial risk due to the long-term, complex and novel nature and the different interaction with non-climate-related risks and vulnerabilities.

There are several factors which could cause the Group's actual results and its plans, targets and objectives to differ materially from those expressed or implied in forward-looking statements. The factors include (but are not limited to): changes in global, political, economic, business, competitive and market forces or conditions, or in future exchange and interest rates; changes in environmental, geopolitical, social or physical risks; legal, regulatory and policy developments, including regulatory measures addressing climate change and broader sustainability-related issues; the development of standards and interpretations, including evolving requirements and practices in ESG reporting and the development of sustainability-related metrics and methodologies; the ability of the Group, together with governments and other stakeholders to measure, manage, and mitigate the impacts of climate change and broader sustainability-related issues effectively; changes in how sectoral pathways for high-carbon sectors develop, the methodologies used to quantify the impact of investment in transition activities, and the metrics and methodologies used to measure attainment in respect of concepts such as 'just transition' and transition activities; risks arising out of health crises and pandemics; risks of cyber-attacks, data, information or security breaches or technology failures involving the Group; changes in tax rates or policy; future business combinations or dispositions; and other factors specific to the Group, including those identified in this document. To the extent that any forward-looking statements contained in this document are based on past or current trends and/or activities of the Group, they should not be taken as a representation that such trends or activities will continue in the future.

No statement in this document is intended to be, nor should be interpreted as, a profit forecast or to imply that the earnings of the Group for the current year or future years will necessarily match or exceed the historical or published earnings of the Group. Each forward-looking statement speaks only as of the date that it is made. Except as required by any applicable laws or regulations, the Group expressly disclaims any obligation to revise or update any forward-looking statement contained within this document, regardless of whether those statements are affected as a result of new information, future events or otherwise.

Please refer to the latest Annual Report and the financial statements of the Group for a discussion of certain of the risks and factors that could adversely impact the Group's actual results, and cause its plans and objectives, to differ materially from those expressed or implied in any forward-looking statements.

Financial instruments

Nothing in this document shall constitute, in any jurisdiction, an offer or solicitation to sell or any securities or other financial instruments, nor shall it constitute a recommendation or advice in respect of any securities or other financial instruments or any other matter.

Basis of Preparation and Caution Regarding Data Limitations

This section is specifically relevant to, amongst others, the sustainability and climate models, calculations and disclosures throughout this document.

The information contained in this document has been prepared on the following basis:

I. Certain information in this document is unaudited;

II. All information, positions and statements set out in this document are subject to change without notice;

III. The information included in this document does not constitute any investment, accounting, legal, regulatory or tax advice or an invitation or recommendation to enter into any transaction;

IV. The information included in this document may have been prepared using models, methodologies and data which are subject to certain limitations. These limitations include (but are not limited to): the limited availability of reliable data, data gaps, and the nascent nature of the methodologies and technologies underpinning thisdata; the limited standardisation of data (given, amongst other things, limited international coordination on data and methodology standards); and future uncertainty (due, amongst other things, to changing projections relating to technological development and global and regional laws, regulations and policies, and the current inability to make use of strong historical data);

The models, external data and methodologies used in information included in this document are or could be subject to adjustment which is beyond our control;

I. Any opinions and estimates should be regarded as indicative, preliminary and for illustrative purposes only. Expected and actual outcomes may differ from those set out in this document (as explained in the "Forward-looking statements" section above);

II. Some of the related information appearing in this document may have been obtained from public and other sources and, while the Group believes such information to be reliable, it has not been independently verified by the Group and no representation or warranty is made by the Group as to its quality, completeness, accuracy, fitness for a particular purpose or noninfringement of such information;

III. For the purposes of the information included in this document, a number of key judgements and assumptions have been made. It is possible that the assumptions drawn, and the judgement exercised may subsequently turn out to be inaccurate. The judgements and data presented in this document are not a substitute for judgements and analysis made independently by the reader;

IV. Any opinions or views of third parties expressed in this document are those of the third parties identified, and not of the Group, its affiliates, directors, officers, employees or agents. By incorporating or referring to opinions and views of third parties, the Group is not, in any way, endorsing or supporting such opinions or views; whilst the Group bears primary responsibility for the information included in this document, it does not accept responsibility for the external input provided by any third parties for the purposes of developing the information included in this document;

V. The data contained in this document reflects available information and estimates at the relevant time;

VI. Where the Group has used any methodology or tools developed by a third party, the application of the methodology or tools (or consequences of its application) shall not be interpreted as conflicting with any legal or contractual obligations and such legal or contractual obligations shall take precedence over the application of the methodology or tools;

VII. Where the Group has used any underlying data provided or sourced by a third party, the use of the data shall not be interpreted as conflicting with any legal or contractual obligations and such legal or contractual obligations shall take precedence over the use of the data;

VIII. This Important Notice is not limited in applicability to those sections of the document where limitations to data, metrics and methodologies are identified and where this Important Notice is referenced. This Important Notice applies to the whole document;

IX. Further development of reporting, standards or other principles could impact the information included in this document or any metrics, data and targets included in this document (it being noted that ESG reporting and standards are subject to rapid change and development); and

X. While all reasonable care has been taken in preparing the information included in this document, neither the Group nor any of its affiliates, directors, officers, employees or agents make any representation or warranty as to its quality, accuracy or completeness, and they accept no responsibility or liability for the contents of this information, including any errors of fact, omission or opinion expressed.

As standards and practices continue to evolve, it may mean subsequent transition plans do not allow a reader to compare metrics, data points or targets between transition plans on a direct like-for-like basis. In addition, the Group's climate related risk capabilities, its net zero transition strategy, targets and transition plan, and its approach towards nature-related impacts, dependencies, risks and opportunities remain under development and the data underlying these, and market practice in relation to the disclosures made in this transition plan, will evolve over time. As a result, certain of such disclosures are likely to be amended, updated, recalculated and restated in future transition plans.

You are advised to exercise your own independent judgement (with the advice of your professional advisers as necessary) with respect to the risks and consequences of any matter contained in this document.

The Group, its affiliates, directors, officers, employees or agents expressly disclaim any liability and responsibility for any decisions or actions which you may take and for any damage or losses you may suffer from your use of or reliance on the information contained in this document. Copyright in all materials, text, articles and information contained in this document (other than third party materials, text, articles and information) is the property of, and may only be reproduced with permission of an authorised signatory of, the Group.

Copyright in materials, text, articles and information created by third parties and the rights under copyright of such parties are hereby acknowledged. Copyright in all other materials not belonging to third parties and copyright in these materials as a compilation vest and shall remain at all times copyright of the Group and should not be reproduced or used except for business purposes on behalf of the Group or save with the express prior written consent of an authorised signatory of the Group.

It is not intended that any of the information contained in this document includes commercially sensitive information in respect of the Group.


standard
chartered