First Movers Coalition

WORLD ECONOMIC FORUM

In collaboration with
Boston Consulting Group

Beyond the Premium: The Economics of Low-Carbon Metals

COMMUNITY REPORT

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Preface

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In early March 2026, the First Movers Coalition (FMC) convened a roundtable in Geneva focused on understanding the cost, pricing and premium of low-carbon aluminium and steel. War had just broken out in the Middle East and – with the region's LNG and aluminium infrastructure under attack – gas and metal prices soared, sharpening the strategic logic of energy security and independence for every participant in the room.

The extended blockade on the Strait of Hormuz led the International Energy Agency to declare it the largest energy crisis the world had ever faced. Although, at the time of writing, a deal intended to end the blockade and the conflict had been announced, we believe this will not fundamentally alter the findings of this report.

Indeed, as leading buyers and suppliers of low-carbon metals gathered alongside policy-makers, financiers and members of the FMC, conflict was only one of several geopolitical factors weighing on their minds. Trade tensions and tariffs look set to negatively impact steel and aluminium exports; meanwhile, the European Union's phase-out of free emissions allowances and phase-in of carbon levies at the border will push up the price of metals with a heavy climate footprint.

Within this volatile context, it is critical to seek clarity on the decarbonization costs and green premiums of low-emissions aluminium and steel, along with the carbon-related policy impacts and financing barriers that determine investment decisions. The industry has proven its technological capacity and readiness to deliver – now, the priority is shifting to the bankability and economics of replacing fossil-fuelled metals with cleaner alternatives.

There are compelling strategic and commercial reasons to make this transition. Leading buyers are looking to protect their long-term competitiveness by booking future supply through offtake agreements with suppliers. Proposed regulatory changes in Europe could generate demand for more than 20 million tonnes of low-carbon steel per year within a decade. Buyers reason that committing to a low-carbon pathway today is less risky than failing to secure the right product at the right price and volume in the 2030s – when rising customer demand, tighter regulation and squeezes on supply seem likely.

Producers, for their part, are conscious of which way the wind is blowing. Metals manufacturers in, for example, Quebec and the Nordic countries, benefit from grids dominated by renewables, positioning their products strategically for both US and European markets. In China, major aluminium manufacturers are moving millions of tonnes of production from coal-fired to hydro-powered energy. Given the vulnerability of one-fifth of the world's LNG trade to geopolitical fortune in the Persian Gulf, shifting to local, independent sources of energy including renewables and nuclear makes strategic sense.

However, the infrastructure projects that produce low-emissions aluminium and steel are complicated and capital-intensive. Suppliers cannot shoulder the

burden alone. Commercial financiers are ready with the right instruments – such as venture debt and sustainability bonds. What they need is bankable investments – de-risked and with proven demand. Governments could greatly assist by stepping in to streamline permissions, while extending grants, concessional loans and tax incentives to support the transition.

Buyers play a key role in building demand by committing to long-term offtake. What emerged at the roundtable is that demand depends on trust; and trust in turn depends on transparency in both the production costs of decarbonized metals and how their emissions profiles are measured. For example, there is still very little alignment in either the market or the policy environment around a single definition of “green” or “low carbon”. This needs fixing. Put simply – buyers want to know what they are paying for.

The conversations were frank about the scale of what remains to be done. Yet the overall mood was, perhaps surprisingly, one of cautious optimism. Three-quarters of FMC members said they believe their low-carbon metals commitments are achievable. Producers confirmed that demand – especially from hyperscalers, automotive leaders and industrial first movers – is growing. Despite – or perhaps because of – the geopolitical turbulence we have seen in recent months, 2026 may yet prove the year when industrial decarbonization is treated as not only a climate investment but also a matter of competitiveness and resilience.

Executive summary

At a challenging moment for the low-carbon metals sector, the key bottleneck to decarbonizing steel and aluminium is finance, not technology.

While the core technologies to decarbonize steel and aluminium are proven, the conditions that would make large-scale, capital-intensive projects bankable – such as long-term demand, stable policies and transparent pricing – remain elusive. This report, which draws on insights from a Forum-convened roundtable of 50+ buyers, suppliers, policy-makers, financiers and FMC members, proposes a compelling set of recommended actions to tackle the challenges facing the sector.

Policy dynamics disrupt markets and reshape cost structures

The past 12 months have been turbulent for industrial metals. The Trump administration's escalation of tariffs – to 50% on articles made of steel or aluminium – has piled pressure on producers already facing higher energy costs and global overcapacity. War in the Middle East sent aluminium prices soaring ~40% to over $3,500 per tonne by early June 2026, while European natural gas futures briefly doubled.

Against this backdrop, Europe's evolving regulations are resetting the economics of low-carbon production. The phased removal of free allowances under the EU Emissions Trading System, alongside parallel tightening of the Carbon Border Adjustment Mechanism, will make carbon-intensive blast furnace steel considerably more expensive by 2030, bringing lower-carbon scrap-EAF steel to cost-parity. The forthcoming Industrial Accelerator Act could add 9 million tonnes of demand for low-carbon steel in its first year of implementation from 2028-29. Proposed amendments to vehicle fleet emissions regulations could generate an additional ~11 million tonnes of demand every year for near-zero emissions steel by 2035.

Supplier realities: high upfront costs and volatile inputs

The costs of producing low-carbon steel and aluminium remain high, closely linked to location and energy prices. In steel, the US retains a significant cost advantage over Europe due to cheaper electricity and abundant domestic gas, which ensure that lower-carbon scrap-EAF and NG-DRI-EAF pathways are already cost competitive with the conventional BF-BOF route. In Europe, however, these pathways need policy support to become competitive. Meanwhile, the H2-DRI-EAF pathway to produce FMC-compliant near-zero emissions steel faces considerable hurdles to become competitive in either the US or Europe, due to uncertainties around the cost of green hydrogen.

For aluminium, electricity accounts for up to 40% of total production costs and roughly 80% of the industry's emissions. The gap between hydro-powered production in Quebec or Scandinavia (which achieves cradle-to-gate emissions of ~4-5 tCO_2e per tonne of primary aluminium) and coal-powered smelting in China (~17-18 tCO_2e per tonne) represents the industry's core decarbonization challenge.

European near-zero emissions iron and steel first-mover projects such as GravitHy in France and Stegra in Sweden demonstrate what is possible when government grants, loan guarantees and concessional debt are combined with long-term demand. Such cases confirm that securing at least half of initial production capacity through advance offtakes is decisive in reaching a final investment decision. Permitting delays – sometimes exceeding a decade for grid connections – remain a serious threat to bankability, and participants called on governments to set binding timelines for permitting litigation.

Buyer priorities: transparency on costs, risks and definitions

Buyers face a problem of trust in what they are paying for – both in terms of green premiums and emissions profiles. A post-roundtable survey found that 70% of respondents could pass through no more than 30% of additional low-carbon costs to end-customers. Buyers are, in effect, absorbing most of the green premium themselves, without the visibility needed to build a sustainable business case for doing so.

For steel, prices are more directly linked to production costs and buyers can negotiate directly with suppliers. However, for aluminium, which

is traded as a global commodity, the pricing methodology obscures abatement costs behind layers of benchmarks, regional premiums, billet differentials and freight components.

Several efficiency-based approaches are gaining traction: designing out excess metal, using more scrap and closing circularity loops by buying back scrap directly from customers. A key recommendation from the roundtable was for buyers and suppliers to work together. For example, long-term offtake agreements, synchronized with suppliers' investment milestones, are a powerful tool to improve bankability for suppliers. Some buyers go further, by co-investing directly in production infrastructure, as Apple did with its stake in the Elysis near-zero aluminium joint venture. Participants highlighted the strategic logic of reframing the green premium not as a cost but as an investment in resilience, supply security and future carbon risk mitigation.

Market transparency and pricing evolution

Green premiums remain opaque – especially in aluminium – since companies trade aluminium of varying emissions intensities, assessed against multiple different methodologies. For example, Fastmarkets' "low-carbon differential" for aluminium is minimal – at around $0-30 or 1% of the all-in price. However, this is for metal of under 4 tCO_2e per tonne (scope 1 and 2), which is already achievable by commercial producers with access to renewable energy. More importantly, this product does not clear FMC's high bar of under 3 tCO_2e per tonne for cradle-to-gate emissions, including the carbon-intensive process of refining of bauxite into alumina, which accounts for around a third of the aluminium industry's total scope 1, 2 and upstream scope 3 emissions.

Meanwhile, Fastmarkets' premium for flat "green steel" in Europe has declined from €200-300 per tonne at launch to around €125 in early 2026 – but its definition of "green" is <0.8 tCO_2e per tonne. By contrast, FMC's bar for near-zero emissions steel is much stricter, ranging from <0.4 tonnes (0% scrap inputs) to <0.05 tonnes (100% scrap inputs) of CO_2e per tonne of crude steel produced.

An interesting debate gravitated around what some see as a problem of competing definitions. Experts at the roundtable argued that the industry should aim to strike a balance between sustainability and liquidity. By setting an emissions threshold that is too tough, trading volumes will never take off, whereas by "casting the net wide" – such as with LME's sustainable aluminium threshold of <8 tCO_2e per tonne – liquidity accelerates and the net can be tightened over time.

The wider challenge is for the global industry to align on a common, standardized methodology to measure emissions. As a representative from a standards-setting organization stated: without a shared definition, products cannot be compared, prices cannot be trusted, and the market cannot scale.

Conclusion and recommendations

- **Use collaborative business models to spread risk across the value chain** – through public-private investment in production infrastructure, synchronizing buyers' offtake agreements with suppliers investment milestones, and transparent supplier-buyer dialogue on decarbonization costs.
- **Build the strategic business case for low-carbon procurement** – anchored in long-term competitiveness and total cost of ownership, including carbon risk, regulatory exposure and supply security, rather than today's spot premium alone.
- **Call on governments to act** – through sustained public investment in breakthrough technologies and renewable energy infrastructure, streamlining and time-limiting the permissions process, and clear, stable carbon-pricing trajectories.
- **Drive market transparency and shared standards** – by supporting initiatives to agree a common, global emissions measurement methodology and working with market partners to develop a tiered threshold framework that maintains FMC's decarbonization criteria while driving liquidity.

Introduction

Although suppliers are facing rising costs and buyers are struggling to justify green premiums, First Movers Coalition members remain committed to their trajectory.

Context and workshop

As the aluminium and steel industries push the boundaries of innovation, the conversation among first movers is evolving from a focus on breakthrough technologies to understanding the economics that will determine their success.

On 5 March 2026, signatories to the low-carbon metals commitments of the First Movers Coalition (FMC) convened at a roundtable workshop in Geneva to explore how investment realities, costs of decarbonization, evolving price formation and market signals – including green premiums – are shaping competitiveness and the future of the metals industry.

The roundtable featured 48 participants including industrial producers and buyers, traders, financiers and policy-makers, who convened to gain a deeper understanding of the factors lying behind the cost, price and premium of low-carbon aluminium and near-zero steel. The workshop's aim was to unlock insights and build confidence in the pathways through which low-carbon metals can deliver both sustainability and enduring value for businesses and consumers alike.

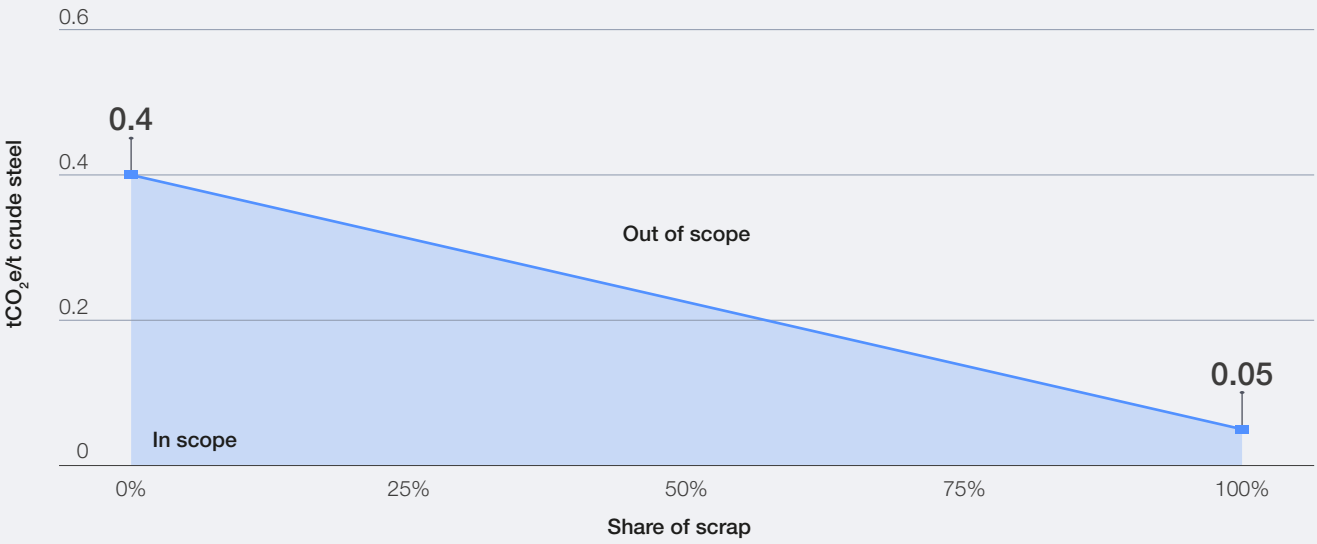
Headline numbers

- **102 leading companies** signing over 125 commitments
- **> $19 billion of global demand** in 2030 for green products across FMC's 7 sectors
- **> 160 offtakes, investments and partnerships** for innovative, clean solutions signed by FMC members
- **~26 million tonnes** of CO_2e abated by 2030
- **15** government partners
- **~ 250 projects** in the First Suppliers Hub

Steel commitment by FMC members

> At least 10% (by volume) of all our steel purchased per year will be near-zero emissions by 2030.

– *Definition of "near-zero emissions"*: crude steel from breakthrough technology production facilities; the steel should emit **<0.4 tonnes (0% scrap inputs) to <0.05 tonnes (100% scrap inputs) of CO_2e per tonne** of crude steel produced, as per International Energy Agency (IEA) guidance.



Aluminium commitment by FMC members

> At least 10% of all our primary aluminium volumes procured per year will be low-carbon by 2030.

– *Definition of "low carbon"*: primary aluminium (99.7% purity) with a carbon footprint of **<3.0 tonnes of CO_2e per tonne** of aluminium produced, including all emissions covered by the sector-specific carbon footprint methodology for primary aluminium by the International Aluminium Institute.

– *Optional commitment*: "In addition to our primary commitment, at least 50% of the total mass of our aluminium procured per year will be from recycled / secondary aluminium by 2030."

Scope of report

This report aims to capture the flavour of the topics discussed, based on conversations at the workshop, research commissioned for the roundtable and follow-up interviews. The report's content is organized across the following chapters and key issues:

1. **Policy environment** – addresses how the costs of producing low-carbon metals are likely to evolve in the European Union (EU) and the US; with analysis on the impacts of developments in the EU Emissions Trading System (EU ETS) and Carbon Border Adjustment Mechanism (CBAM), the proposed replacement of steel safeguards by a permanent trade regime, modifications to the EU vehicle fleet emission regulation and the Industrial Accelerator Act (IAA) proposal.

2. **Supplier realities** – highlights multiple barriers to developing commercial-scale projects, such as major upfront investments, unpredictable market demand, and volatility in production costs driven by energy prices, scrap availability and regulatory changes.

3. **Buyer priorities** – addresses concerns about the availability of low-carbon metals at sufficient scale, transparency around the green premium and true costs of new technologies, and credible ways to demonstrate customer value during the transition to more sustainable materials.

4. **Market transparency and pricing evolution** – analyses why low-emission metals, especially aluminium, remain part of a complex and opaque market; and how carbon pricing, certification, green premium drivers, risk-hedging and evolving buyer-supplier dynamics are reshaping competitiveness, risk and opportunity.

5. **Conclusion and recommendations** – including key findings from Mentimeter participant survey in Appendix.

Financing low-carbon metals and factors threatening bankability

Cutting across all chapters is the emerging reality that finance rather than technology has become the key bottleneck to decarbonizing the metals sector. The issue is not a lack of available capital, but concerns around the *bankability* of low-carbon metals. Suppliers, buyers, financiers and insurers each have a different perspective on the risks to bankability of green metals projects (see Figure 1).

For producers and suppliers, the main risk is lack of demand. Without secure offtake agreements, producers cannot build a bankable business plan to raise debt or equity to finance capital intensive projects. Another major concern for promoters of major new infrastructure projects is the duration of the permitting and permissions process, especially in Europe.

For buyers, the risk manifests in a lack of trust in what they are paying for. Does the green premium reflect actual production costs or simply supply/demand dynamics? What are the factors going into the market price of traded commodities such as aluminium, and how do they evolve? Buyers are also seeking greater confidence in how emissions are measured and how products conform to international quality standards.

Investors and insurers share all these concerns to the extent they affect portfolio companies and investment opportunities. Meanwhile, the wider risk landscape of geopolitics and government policies affects all ecosystem actors. Conflict in the Persian Gulf – which broke out just days before the roundtable – trade tariffs and inconsistency of regulation (especially around standards and definitions for "green" and "low-carbon") are all risks affecting the bankability of decarbonized metals.

Rather than addressing concerns around bankability and finance in isolation, the report tackles them as they arise in the respective chapters on policy dynamics, supplier realities, buyer priorities and market transparency.

FIGURE 1 | **Key uncertainties for suppliers and buyers of low-carbon metals**

Suppliers
Key uncertainties

- Recoverability of increased production costs (CapEx and OpEx) via green premiums
- Stability of policy environment for long-term investments and across asset lifetimes
- Capacity build-out risk from demand uncertainty and technical delays
- Cost-efficiency of decarbonization technology (CCUS, EAF, H_2, renewables, inert anodes)

Buyers
Key uncertainties

- Evolution of green premium[1] for low-emission metals and breakeven with conventional metals
- Effect of carbon costs (e.g EU ETS, CBAM)
- Risk of insufficient supply of low-emission metals and scarcity-driven price premiums
- Lack of comparability of supply offers due to fragmented standards and methodologies

Notes: 1. As well as the green premium's split across the value chain (between suppliers, buyers and end-users). CCUS = carbon capture, utilization and storage, EAF = electric arc furnace, ETS = emissions trading system, CBAM = carbon border adjustment mechanism.

Source: First Movers Coalition and Boston Consulting Group.

1 Policy dynamics disrupt markets and reshape cost structures

While US tariffs have disrupted "industry-as-usual", emerging European legislation will benefit low-carbon metal producers from the 2030s.

1.1 The impact of geopolitics and importance of stable policy-making

War in the Middle East has sharpened the importance of energy security and independence in the minds of policy-makers from Europe to East Asia.

The core decarbonization technologies needed for low-carbon aluminium and near-zero steel are now proven at pilot and early stage development. So the discussion is moving from technology to policy and economics. To scale up these breakthrough technologies requires enormous capital investment, which in turn can only flow with long-term certainty in both policy and demand signals.

However, in recent years that certainty has been undermined by geopolitical turbulence including conflict in Ukraine and the Middle East, as well as trade tariffs and retreat from multilateral cooperation. Suppliers are facing higher energy costs, global overcapacity and lower-cost competition, while buyers face inflated costs and diluted margins.

Low-carbon industries need strong policy and demand signals to thrive

The policy discussion on decarbonizing carbon-intensive production of metals has long focused on generic issues such as derisking, public support and permitting. However, the wider geopolitical turbulence of the past 12 months – from the Trump administration's embrace of tariffs to war in the Middle East (see Box 2) – has highlighted the vital role of consistent policy-making. In particular, companies in regions with a stable policy environment and a long-term commitment to decarbonization thrive, while companies in less predictable jurisdictions struggle.

BOX 2 **War in the Middle East forces policy-makers to rethink dependence on fossil fuels**

The outbreak of war in the Middle East at the end of February 2026 loomed large over the meeting. During March, two international metal producers – Emirates Global Aluminium and Aluminium Bahrain – suffered direct hits that caused significant damage. Meanwhile, Ras Laffan in Qatar – the world's largest liquified natural gas (LNG) terminal – was hit by Iranian missiles and drones, wiping out 17% of Qatar's LNG capacity for up to five years.[1] As the war dragged on, the blockade of the Strait of Hormuz – which prevented the passage of nearly all commercial shipping – sent energy prices soaring, despite periodic ceasefires reducing hostilities.

While natural gas is not considered by FMC as a valid pathway to produce low-carbon metals, the wider metals production industry uses considerable quantities of LNG. As the war drives up energy costs and reduces metal production capacity, this will indirectly impact investment in and the market for lower-carbon products.

The war has sharpened the importance of energy security and independence in the minds of policy-makers from Europe to East Asia.[2] In April 2026, Fatih Birol, head of the International Energy Agency (IEA), warned: "We are in the midst of the largest energy security crisis the world has ever faced." He predicted that "renewables will grow very strongly" as a result of the ongoing threat to the Strait of Hormuz.[3]

Transitioning to low-carbon solutions – both in energy generation and industrial manufacturing – could therefore become a higher priority for many governments for broader security reasons beyond climate targets.

Stability in governments' regulations and commitments to net-zero are critical to promote the decarbonization of aluminium and steel. Equally important is a consistent strategy to develop renewable energy. So it is not surprising to see a slowdown in investment in new low-carbon metal technologies in the US due to the stance of the current administration, said a leading European automaker. US tariffs on steel and aluminium have put further pressure on Europe's producers (see Box 3).

BOX 3

US tariffs on steel and aluminium pile up pressure on Europe's producers

In April 2026, the Trump administration raised US steel and aluminium tariffs as follows:

- 50% **tariff** on the full value of "articles made entirely or almost entirely of aluminium, steel or copper"
- 25% **tariff** on the full value of "derivative articles substantially made of aluminium, steel or copper"

Reacting to the US's earlier rates of 25% on steel and aluminium levied in March 2025, the European Commission said the tariffs "will not only negatively impact EU producers by limiting access to the US market, including for base metals processed into further downstream goods, but will also increase pressure from exports previously destined to the US that could be redirected to the EU."

This policy move by the US risks undermining the economics of green metals producers who have built their business cases on premium pricing.

Source: The White House, European Commission.[4]

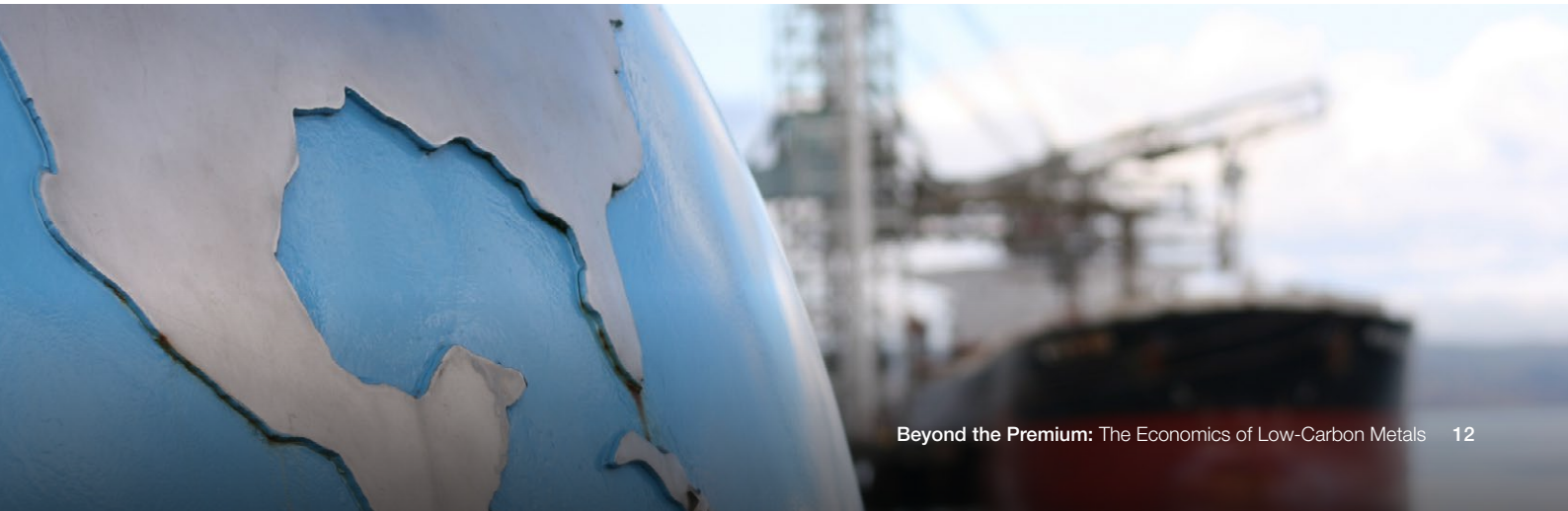
Addressing the roundtable, a senior representative of the Spanish government emphasized the need for policy-makers to send strong demand signals to investors, by promoting long-term offtake and stable regulation. His government is looking at "market creation on the policy side", through embracing an industrial competitiveness strategy that invests in reliable policy signals, clean energy investment and access to infrastructure – in particular to boost availability of green hydrogen. He emphasized this approach aims to provide the market stability that producers and their investors need to commit to future production.

> **The transition is a once-in-a-generation opportunity, not only to strengthen our industrial base but to accelerate emissions reduction targets that we have committed to.**
>
> Miguel Gómez-Pavón López, Deputy Director-General for Strategy and Industrial Ecosystems, Ministry of Industry and Tourism of Spain

The policy conversation has continued to evolve in recent years. Five years ago, the talk was about how "in the US they invent, in the EU we regulate." However, recent geopolitics has reminded the private sector of the added value of good regulation. "The EU may not be fast but what we agree is stable – it sends clear signals on what we expect," said the official.

Direct state support is also critical for capital intensive, first-of-a-kind projects to produce low-carbon metals – this is discussed further in Chapter 2.

Meanwhile, governments play a key role in codifying what is meant by terms such as "green", "low-carbon" and "near-zero". Many stakeholders in the industry highlight the need for a common language, along with a shared set of international standards and metrics, to shift the conversation from the political arena to the technical sphere. This is addressed further in Chapter 4.



1.2 EU regulation seeks to create level playing-field for low-carbon goods

The latest drafts of proposed European Union (EU) legislation advance a comprehensive policy framework aimed at strengthening competitiveness, fostering domestic industrial growth and achieving net-zero emissions targets.

The regulations below aim to create an internal market where demand for low-carbon materials and products grows as they become more competitive compared to fossil-based incumbents. However, they also introduce considerable complexity both for domestic producers and global importers to navigate (see Figure 2):

- Phase-out of free allocations under the EU's Emissions Trading System (ETS)
- Implementation of the EU's Carbon Border Adjustment Mechanism (CBAM)
- Replacement of steel safeguards by a permanent trade regime
- Proposed amendment to the EU's vehicle fleet emissions regulation
- Proposed new EU Industrial Accelerator Act (IAA)

Impact of evolving EU regulation on production of low-carbon steel

This section focuses on the impact of EU regulation on the costs of low-carbon steel production and is based on recent analysis by Boston Consulting Group (BCG). For aluminium, production costs are more opaque, influenced less by regulation than by local and global market forces – such as the cost of electricity at the point of smelting and the impact of international metal trading. Aluminium costs are discussed further in Chapter 2 and Chapter 4, which address producer costs and the impacts of metal trading respectively.

FIGURE 2 **Impact of recent regulatory shifts on EU steel market dynamics**

Source: Boston Consulting Group.

Lower-carbon steel produced via a scrap-EAF pathway will become cost-competitive in Europe by 2030.

ETS and CBAM

Through a series of far-reaching policy measures, the EU is seeking to create a level playing-field for low-carbon steel. At the heart of these changes is the way the EU's CBAM "mirrors" the effect of the ETS. As the ETS reduces the availability of its free EU allowances (EUAs – effectively, "licences to pollute"), CBAM increases its penalties on imports of carbon-intensive goods and materials into the single market.

This has two impacts on the cost to European industries of decarbonizing steel production. The ETS imposes a carbon price on European producers of carbon-intensive steel, while CBAM adds a similar price to all carbon-intensive steel imports. Until 2025, sectors such as steel and aluminium enjoyed 100% of their eligible free allowances. After a few years of slow decline from 1 January 2026 onwards, this will drop to 51.5% of eligible free allowances by 2030, falling to zero by 2034. For imports, CBAM's financial obligation rises correspondingly until importers effectively face the full EU ETS carbon price by 2034.

The risk inherent in this policy design is that, while free allowances shelter Europe's nascent low-carbon industries, the phase-out of those allowances exposes upstream producers to the risk of volatile EUA prices driven by market forces, while exposing downstream producers to higher prices for both domestically sourced and imported basic materials. As a result, at least 10 member states lobbied the European Commission to consider an extension to the 2034 phase-out deadline during the full ETS review in July 2026.

Imports are going to become more expensive and, if the producer country cannot prove its emissions data, CBAM will adopt a default worst-case value, leading to higher penalties at the border. For example, importing steel at default emissions levels for South Korea, Türkiye or India could lead to CO_2 costs of, respectively, 2x, 3x or 7x more than buying European steel – even with the ETS cost included. Consequently, it is critical that European buyers push for actual verified emissions data on all imports.

We truly see European steel at an inflection point. There is going to be a supply shock, a demand shock and labour disruption.

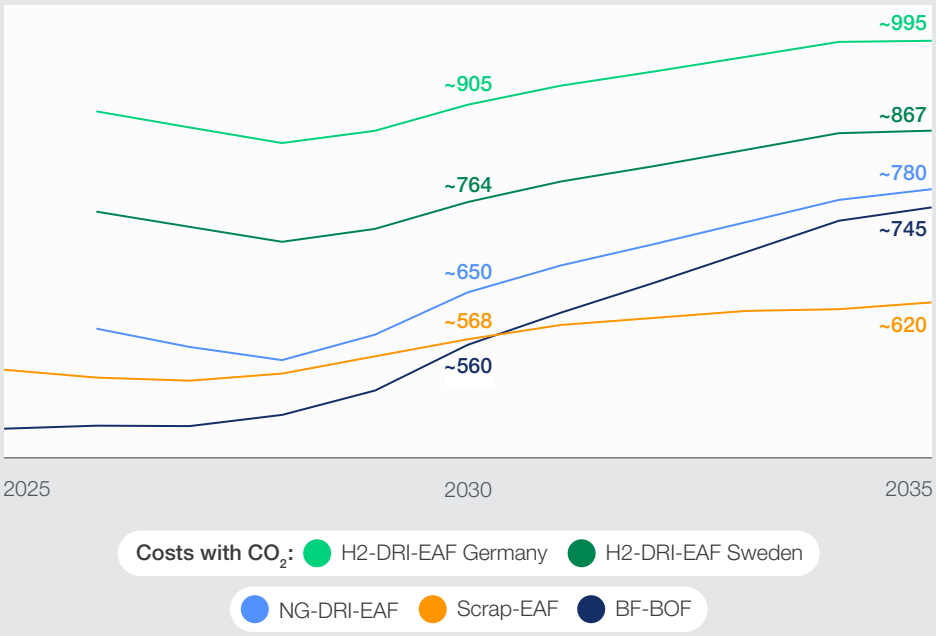
Martin Feth, Managing Director and Partner, BCG, Munich

Nevertheless by 2030, with the ETS cost of carbon predicted to approach €130 per tonne, the price of all steel – both imported and domestically produced – will rise significantly, with high-emissions steel produced using the blast furnace-basic oxygen furnace (BF-BOF) climbing the fastest. As a result, lower-carbon steel produced via a scrap-EAF pathway will become cost-competitive in Europe by 2030 (see Figure 3).

FIGURE 3 | **Evolution of steel production costs in Europe – including cost of carbon**

Accounting for EU carbon pricing, scrap-EAF steel will be cost-competitive by 2030

Projected hot-rolled coil (HRC) steel costs by route – OpEx + CapEx + EU ETS carbon costs (2025-2035)
€/t HRC, incl. cost of CO_2



EU, 2030 AS OF FEBRUARY 2026 WITH ETS

H2-DRI-EAF: From 2034, costs incl. CO_2 price will be higher than without CO_2 price due to free allocations phase-out, as even this route has scope 1 emissions (~140kg CO_2/t HRC)

NG-DRI-EAF: Continuous increase of costs is caused by CO_2 costs, with only slight increase attributable to other cost drivers

Scrap-EAF: Steady increase in costs taking into account CO_2 price

BF-BOF: Costs increase consistently with CO_2 costs; continuity in other cost drivers

Notes: Assumes both iron and steelmaking steps in Germany for BF and DRI routes. For H2-DRI-EAF Sweden, only assumed hydrogen prices are different. For emissions and calculation of CO_2 costs, only scope 1 emissions are considered under EU ETS boundary conditions. Extrapolation is based on current commodity price assumptions and forecasts, subject to changes in future. ETS CO_2 price assumes increases from €68 (in 2025) to €125 (in 2030) and €165 (in 2035). Hydrogen prices used to build this model are as follows – Germany: hydrogen prices of €6.50/kg (in 2030) and €5.90/kg (in 2035); Sweden: hydrogen prices of €4.30/kg (in 2030) and €3.90/kg (in 2035).

Source: Boston Consulting Group.

80%

Projected share of domestic steel supply in the EU under the new trade regime.

11Mt

Projected new demand for very low-carbon steel produced in the EU, due to proposed revision to vehicle fleet emissions regulation.

Additional legislation – import quotas, tailpipe targets, public procurement

Three more pieces of proposed legislation will add to the impact of the CBAM and ETS: a permanent trade regime to replace steel safeguards, revisions to the EU vehicle fleet emissions regulation and the Industrial Accelerator Act.

Permanent trade regime to replace steel safeguards

The new permanent trade regime, likely to start in July 2026, is expected to cut tariff-free import quotas of steel by 46% from 33.8 to 18.3 million tonnes (Mt), while doubling duty on out-of-quota steel from 25% to 50%. As a result, the share of domestically produced steel could increase from around 70% today to more than 80%, assuming local producers fill the gap. Buyers will need to understand their sourcing alternatives at a country, supplier and product level, across both timing and volumes, to manage their cost baselines.

Revision to EU vehicle fleet emissions regulation

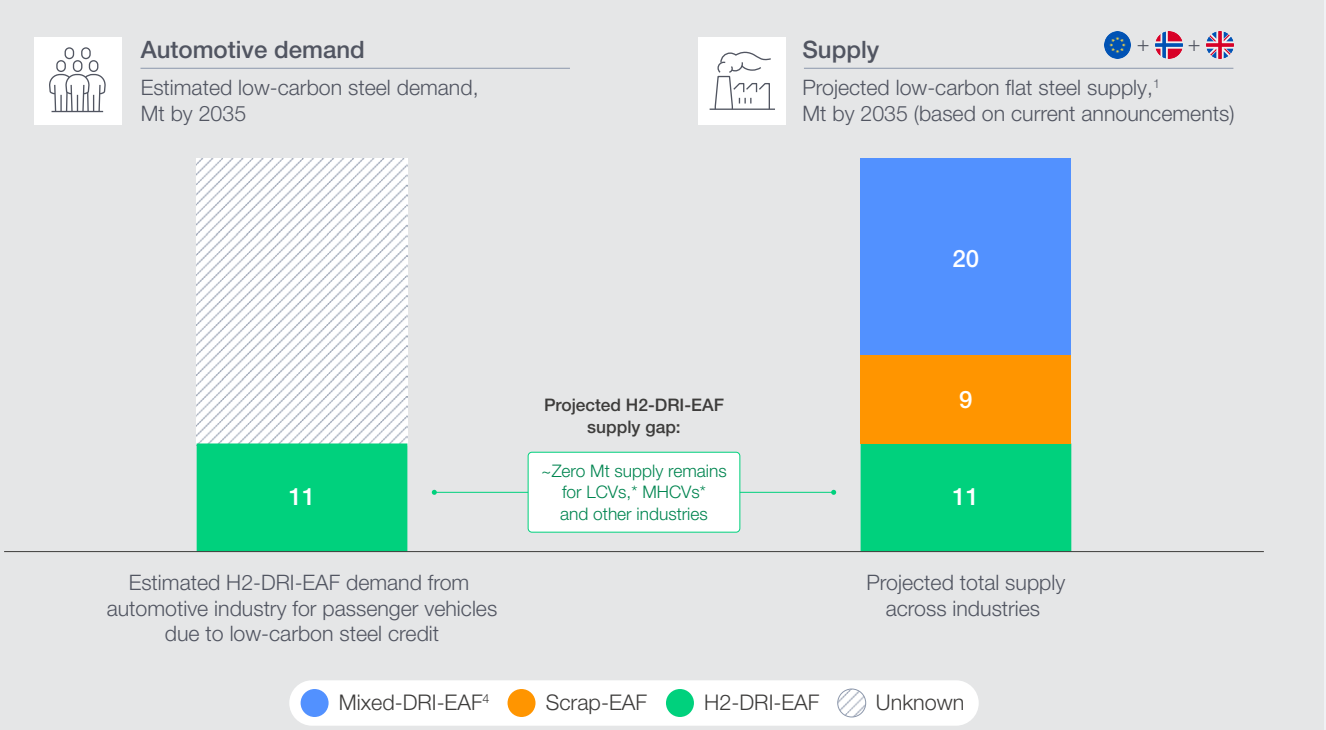
The revision to the EU vehicle fleet regulation, proposed in December 2025, aims to reduce the tailpipe emissions of cars and vans by at least 90% by 2035, rather than the originally legislated 100% reduction. Manufacturers are permitted to compensate for the remaining 10% of emissions through low-carbon steel credits (up to 7%) and a fuel credit mechanism for renewable fuels (up to 3%). If they fall short, they will face a heavier penalty than the current premium of €250-300/tonne on low-carbon steel.

To maximize carbon credits, OEMs would need to replace conventional BF-BOF steel with lower-emissions alternatives. BCG estimates that this regulation could add ~11Mt of demand for EU27-made low-carbon steel – primarily produced via the H2-DRI-EAF route, which uses green hydrogen for

direct iron reduction and renewable-powered electric arc furnaces. By 2035, 11.9 million passenger cars sold in the EU would require around 70% of their steel to come from this process.

To put this into perspective, the new demand anticipated by this regulation is equivalent to the entire amount of H2-DRI-EAF steel supply expected in the EU in 2035, based on current announcements. Given other industries may also require near-zero steel by 2035, the supply gap that this regulation creates will provide the principal scenario under which near-zero, FMC-compliant primary steel is cost-competitive in Europe (see Figure 4).

FIGURE 4 **EU fleet targets make near-zero H2-DRI-EAF steel cost-competitive by 2035**



Regulation incentivizes EU-based demand of **~11Mt p.a. H2-DRI-EAF** steel[2] for passenger cars

Low-carbon steel is in the money as maximum avoided penalty exceeds cost of replacing BF-BOF with H2-DRI-EAF steel[3]

Projected H2-DRI-EAF steel capacity of ~11Mt p.a. in 2035 leaves **supply gap** due to other industries' demand

Notes: 1. For simplification, only flat steel is considered; includes supply from EU27, UK and Norway. **2.** The total demand incentive is calculated by multiplying the required steel emission reduction per car (1.9t CO_2e/t of steel) by the number of EU passenger cars produced (11.5 million), then dividing the resulting CO_2 volume by the emission savings per tonne of low-carbon steel (2.0t CO_2e/t of steel for H2-DRI-EAF vs. BF-BOF). H2-DRI-EAF represents the closest steelmaking route to near-zero-carbon steel. **3.** Costs associated with replacing BF-BOF steel with H2-DRI-EAF steel stand at €250/t of steel and therefore do not exceed maximum avoided penalty of €745. **4.** Mixed-DRI-EAF refers to a DRI-EAF route where the fuel mix used to produce DRI consists of both natural gas and hydrogen.
* LCV = light commercial vehicle; MHCV = medium and heavy commercial vehicle.

Sources: European Commission, IHS, BCG analysis.

9Mt

Projected new demand for "low-carbon" steel in the first year of IAA's implementation (2028-29).

Industrial Accelerator Act (IAA)

The proposed Industrial Accelerator Act (IAA) introduces demand-side measures by requiring a minimum share (25%) of "low-carbon" steel in public procurement and subsidized projects and products (e.g. vehicles) from 2028-29, particularly in construction, infrastructure and automotive sectors. This is expected to generate significant early demand of up to 9Mt per annum for low-carbon steel in the first year of implementation, according to BCG estimates. However, the regulation's effectiveness depends critically on how the IAA defines "low-carbon" steel; as this is not yet clear, this definitional gap remains a central uncertainty shaping investment incentives and market outcomes.

FIGURE 5 **Implications of regulatory changes for European buyers of steel**

1	**Regulation is significantly reshaping EU steel market dynamics** through five levers: ETS, CBAM, permanent trade regime, vehicle fleet emission credits and Industrial Accelerator Act.
2	**Demand will shift towards EU-based, low-carbon steel** through penalized high-emission imports, raised CO_2 costs, halved tariff-free quotas and low-carbon incentives and labels.
3	**EU buyers should prepare for structurally higher steel prices** and assess their exposure to cost inflation and potential supply scarcities across key grades and categories.
4	**Sourcing strategies and cost models** need to be upgraded to reflect volatility, carbon cost pass-through and changing import dynamics.
5	**Securing early access to EU-based low-carbon steel** will be critical; buyers should actively engage suppliers on decarbonization pathways and verified emissions transparency.

Source: Boston Consulting Group.

2 Supplier realities: high upfront costs and volatile inputs

Low-carbon pathways offer producers resilience to geopolitical shocks, but governments need to support projects with funding, consistent policies and swift permitting.

FMC producers and suppliers of low-emissions aluminium and steel face some key realities and uncertainties, including:

- **Recoverability of increased production costs** via green premiums, covering both major upfront investments and volatility of operating costs, driven by rising energy prices and scrap availability.
- **Stability of the policy environment** for long-term investments and across asset lifetimes.
- **Risk to capacity build-out** from demand uncertainty, permitting and technical delays.
- **Cost-efficiency of decarbonization technologies**, including carbon capture and storage, electric arc furnaces, green hydrogen, renewables and inert anodes.

2.1 Supply-side costs, risks and barriers to scale

> In Europe, given its higher energy prices, the scrap-EAF and NG-DRI-EAF pathways need policy interventions to make them competitive.

Low-carbon steel costs driven by policy and power prices

The cost of producing low-carbon steel is significantly lower in the US than in Europe – and is predicted to remain that way for the next decade due to lower energy prices (see Figure 6). Electricity is cheaper in the US, which makes the scrap-EAF route a more bankable proposition, while delivering low-carbon steel with a cradle-to-gate emissions footprint of ~0.77 tCO_2e/t crude steel.[5] Today, the US produces over 70% of its steel this way. However, this route is only FMC-compliant when the EAF is powered by renewables.

Meanwhile, natural gas – used in the NG-DRI-EAF process to manufacture lower-carbon steel – typically costs 2-4 times less in the US than in Europe, given America's abundant domestic shale resources. However, this route still emits at least 1.4 tCO_2e/t[6] – double the emissions of the scrap-EAF process. Nevertheless, many producers consider NG-DRI-EAF a transition technology and are building NG-DRI plants designed to be hydrogen-ready, so the shaft furnace can be switched to green hydrogen as supply scales up.

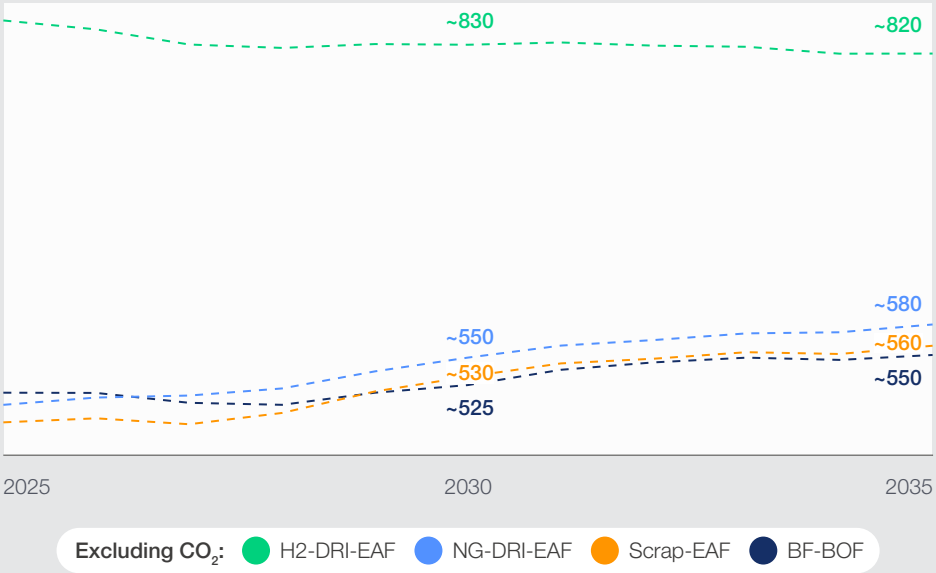
In the US, both the scrap-EAF and NG-DRI-EAF pathways are already cost competitive with the conventional BF-BOF route, without further policy support, and are expected to continue that way. In Europe however, given its higher energy prices, the scrap-EAF and NG-DRI-EAF pathways need policy interventions from the EU ETS and CBAM to make them competitive, and only then by 2030 and 2035 respectively.

It is important to note that neither the scrap-EAF nor the NG-DRI-EAF pathways comply with the FMC's strict criteria for "near-zero emissions" steel, which should emit <0.4 tonnes (0% scrap inputs) to <0.05 tonnes (100% scrap inputs) of CO_2e per tonne of crude steel produced. The H2-DRI-EAF pathway to produce FMC-compliant steel faces considerable hurdles to become competitive in both the US and Europe, due in large part to uncertainties around the cost of green hydrogen. As seen in Chapter 1, demand for near-zero emissions steel needs to be driven by policy measures, such as the EU's proposed revisions to vehicle fleet emissions regulations.

Regardless of jurisdiction, the most cost-sensitive inputs for steel production remain the same in both the US and EU: electricity, natural gas, hydrogen and direct-reduced iron (DRI) pellets. Availability and cost of scrap is also a key cost driver.

FIGURE 6 | **In the US, scrap-EAF and NG-DRI-EAF steel will remain cost competitive for the next decade**

Possible development of HRC steel costs (OpEx + CapEx, without CO_2 prices) up to 2035
€/t HRC, without cost of CO_2



USA AS OF FEBRUARY 2026

H2-DRI-EAF: Decreasing hydrogen costs offset increasing scrap and DR pellet prices to ensure falling H2-DRI- EAF costs by 2035

NG-DRI-EAF: Small increase in costs, driven by slightly rising scrap and DR pellet prices

Scrap-EAF: Moderate increase in costs due to increase in scrap prices from 2029

BF-BOF: Moderate increase in BF-BOF costs from 2030, driven in particular by rising scrap and iron ore prices

Note: Assumes both iron and steelmaking steps in US for BF and DRI routes. Extrapolation based on current commodity price assumptions and forecasts, subject to changes in future.

Source: Boston Consulting Group.

Low-carbon aluminium costs driven by location and energy emissions baseline

The costs of decarbonizing aluminium are far more location-specific and less transparent (see Figure 7). The process is highly dependent on how low the emissions baseline is for the electricity grid powering the smelters – and how expensive that power is. Electricity accounts for up to 40% of total production costs in aluminium smelting,[7] compared to ~20% for steel's scrap-EAF route (see Box 4).[8]

BOX 4

Power in numbers

~20%	share of total **steel production costs** driven by electricity (scrap-EAF route)
~40%	share of total **aluminium production costs** driven by electricity
~80%	share of global **aluminium industry's emissions** driven by electricity

Source: Industrious Labs/Fastmarkets.[9]

Buyers in regions with plentiful hydro-power are able to access some of the cheapest and lowest-carbon aluminium in the world – for example most of the aluminium manufactured in Quebec, Canada uses hydro-power. Emissions intensity for Quebec's aluminium averages ~1.8 tonnes of CO_2e per tonne of aluminium (tCO_2e/tAl), across scope 1 and 2. Including upstream scope 3 emissions, aluminium manufactured using hydro-power averages 4-5 tCO_2e/tAl – approaching the FMC's low-carbon target of 3 tCO_2e/tAl.

However, Quebec's aluminium production capacity is relatively limited at ~4Mt per year. By contrast, Asian aluminium – produced mainly by China's huge coal-powered smelting industry – is both the most plentiful (50Mt capacity) and the most carbon-intensive (~10.9 tCO_2e/tAl) for scope 1 and 2. Include scope 3 and China's aluminium output averages more like 17-18 tonnes of CO_2 per tonne of aluminium (see Figure 7).[10]

Decarbonization of the aluminium industry from coal-powered baselines will require high green premiums to achieve the low emissions intensity levels of hydro-powered aluminium production. Meanwhile, given aluminium trading is transaction-based, the lack of transparency around abatement costs continues to sow doubt in the minds of buyers and investors.

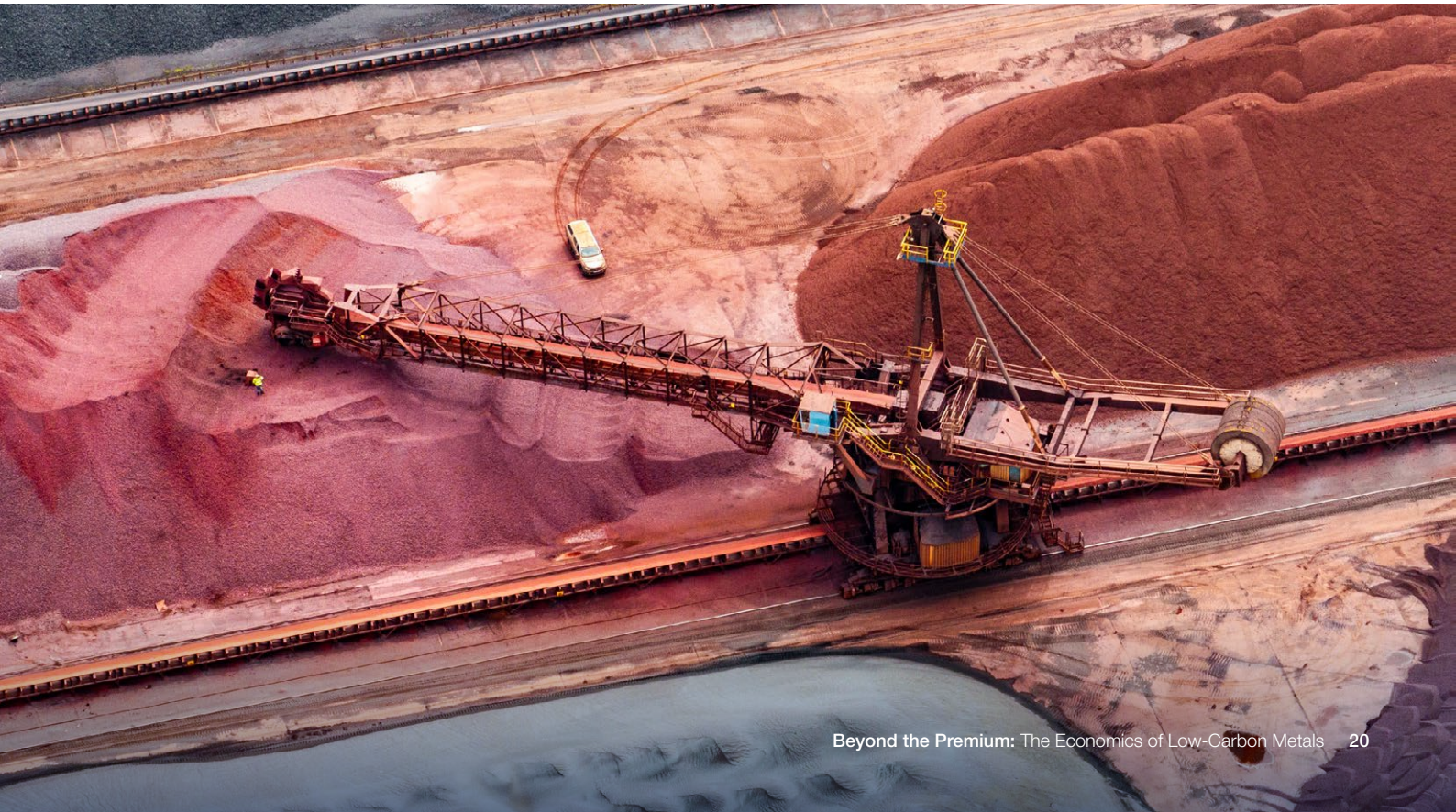
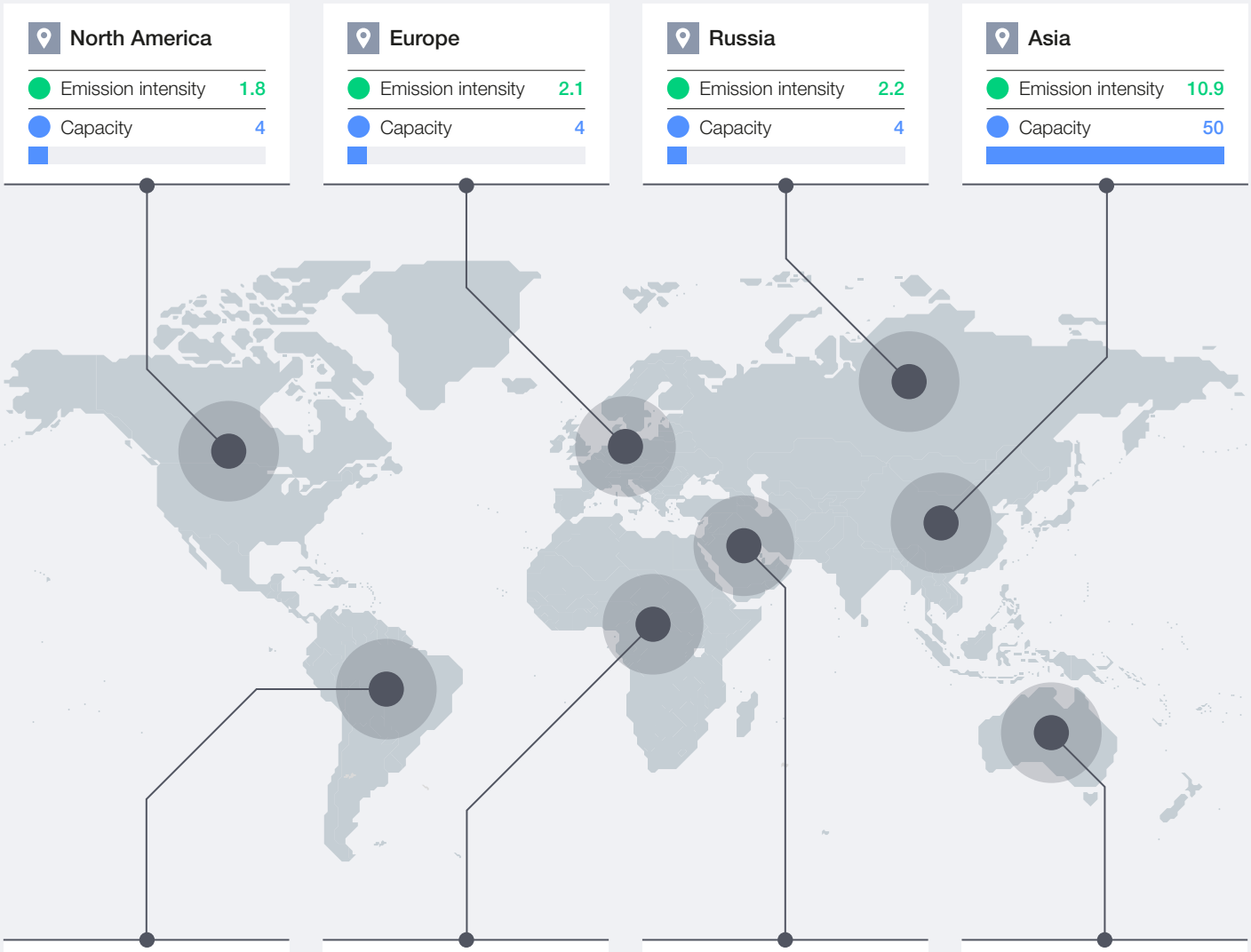


FIGURE 7 | **Aluminium smelting emissions and production volumes vary widely by region**



Key takeaways

AS OF JANUARY 2026

- Asia remains world's largest supplier – mainly driven by China's large smelting base
- North America, Europe, South America and Russia have lowest emissions due to low-carbon electricity
- Asia, Oceania and Africa produce the most emissions-intensive metal, driven by coal-based power generation and older smelting technologies

- Shifting procurement towards low-intensity regions or accelerating clean power retrofits offers material abatement potential

Notes: Emission intensity includes smelter scope 1 and 2 only.

Source: WoodMackenzie, Boston Consulting Group.

~40%

Rise in LME official price of aluminium/tonne, June 2026 vs. 2024 average

~100%

Rise in price of European natural gas futures/MWh, February to March 2026

While green metal plants located in regions rich in renewables, such as Quebec or Scandinavia, start at an advantage, power is just one of many cost factors for complex infrastructure projects. Stegra – one of Europe's flagship green steel projects, located in northern Sweden – demonstrates how critical other cost drivers are too. In October 2025, the company sought to raise a further €975 million of investment, in part to cover higher-than-expected construction costs and delays in government grants (see Box 5).[11]

Uncertainty around ETS policy and the carbon price

The robustness of the carbon price weighed on the minds of some suppliers attending the roundtable. One European startup company seeking final investment decision (FID) on an H2-DRI plant – which plans to produce green hydrogen to make direct reduced iron (H2-DRI) for onward sale to low-carbon EAF steel plants – is concerned about policy interventions causing a fall in Europe's carbon price. "If the cost of carbon never goes above €80-90 per tonne of CO_2, then we will be out of business," he said, since any drop in the carbon price benefits incumbent, high-emissions iron and steel producers at the expense of first movers looking to decarbonize the industry.

The risk is that Europe's ETS is more of a managed market than a free market. Policy-makers do not set the carbon price directly, but they do control the quantity of allowances (EUAs) in circulation and that quantity determines the price range within which market forces operate. The European Commission is reviewing the ETS in July 2026 and could extend policy control further, especially given pressure on the Commission from at least 10 member states to take action to ease economic costs in the light of ongoing geopolitical turbulence.

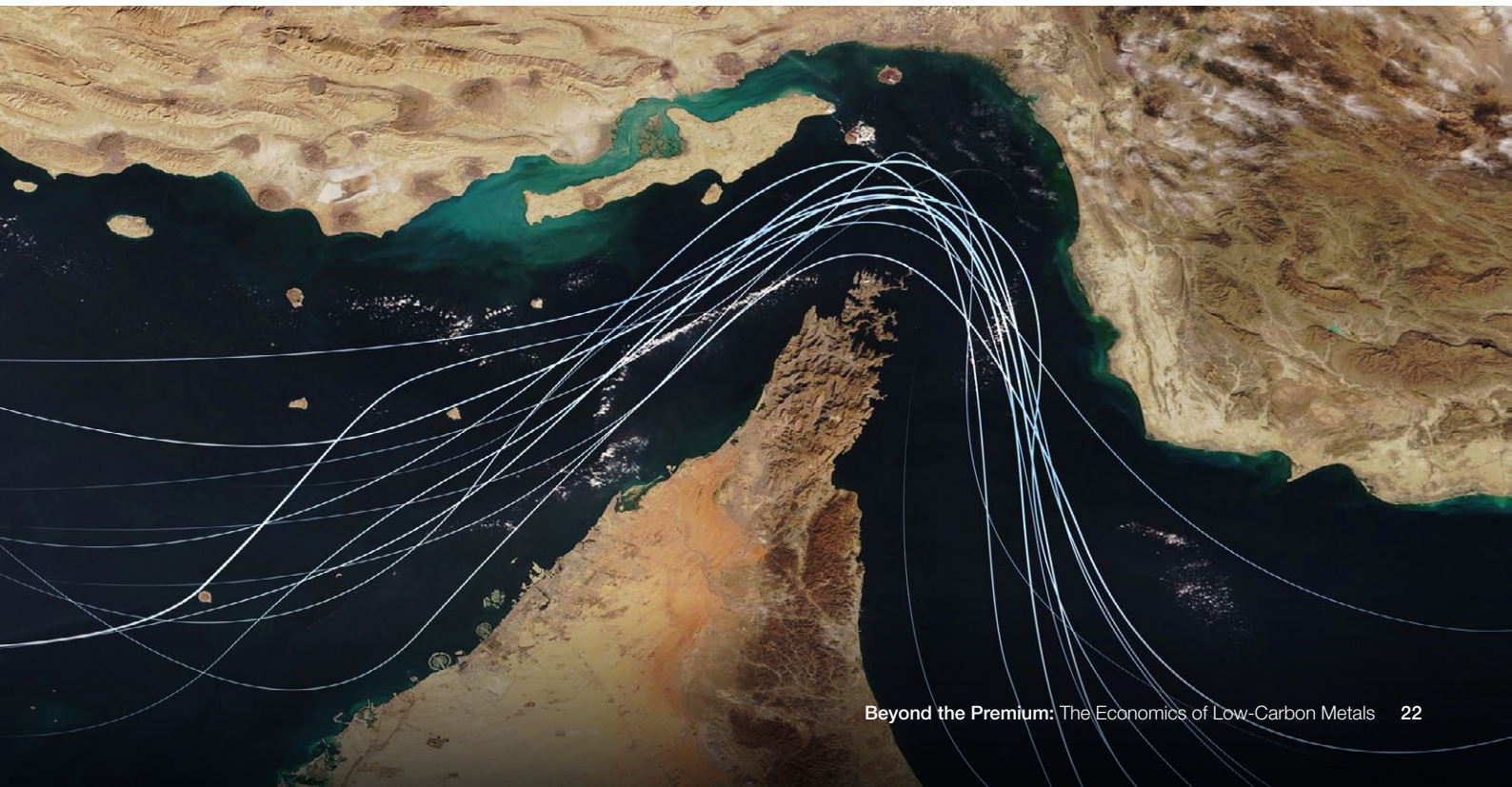
Geopolitics throws a curve ball

The war that broke out in the Middle East in late February 2026 has exposed low-carbon metal suppliers and buyers alike to enormous volatility across energy prices and supply chains. When missile strikes hit the region's gas and aluminium infrastructure (see Box 2), the cost of both aluminium and the natural gas vital to power the region's aluminium smelters – as well as to reduce iron using the NG-DRI-EAF route – soared.

Meanwhile, exports of gas and aluminium from the Gulf have suffered severe supply chain disruptions due to the near standstill in marine traffic through the Strait of Hormuz. For a region that accounts for around 20% of the world's LNG trade and 8% of global primary aluminium production,[12] the conflict has had a huge impact on both the cost of aluminium production and its market price. Before the war, aluminium traded at around $2,500/tonne (2024 average). By early June 2026, the price had leaped ~40% to over $3,500/tonne, according to the London Metal Exchange (LME).[13]

Disruption to natural gas supplies in the Gulf doubled the price of European natural gas futures, from around €30/MWh immediately before conflict broke out to a peak of more than €60/MWh by mid-March – prices not seen since late 2022.[14]

> **The cheapest way to make electricity used to be natural gas – but now it's solar.**
>
> Participant from a Nordic steel company



2.2 Resilient solutions in a volatile trading environment

> The mood among suppliers is surprisingly positive on demand – with consistent demand growth for premium, low-carbon steel from hyperscalers in the US.

Commitment to a low-carbon pathway safeguards energy security

War in the Gulf is forcing industrial manufacturers of all kinds to reconsider their dependence on fossil fuels sourced from the Middle East.[15] Some are committing wholeheartedly to a low-carbon pathway – but for economic as well as climate reasons.

The roundtable heard from a senior advisor to a major Chinese aluminium manufacturer that produces 6.5Mt of primary metal per year – nearly 9% of global production.[16] The company is shifting 4Mt of its production out of Shandong province, where coal accounts for 70% of power generation, into Yunnan province, where 91% of the grid is supplied by renewables, mainly hydro.[17] In addition, it is installing 10GW of solar power by 2030, along with its own storage capacity.

Part of the reason is that the company – from the chair, to the management, to the shareholders – is fully committed to reaching net zero. "If you haven't got the commitment at the highest levels in the company, you're never going to get there," said the advisor. The Chinese government also has its commitments – to peak carbon emissions before 2030 and achieve carbon neutrality by 2060.

Beyond commitments, the company sees net zero as the direction of travel for the global economy, where low-carbon is going to become the norm. "Turn the conversation around," he said: "This is not about the premium. If you don't have a low-carbon future you're going to face a discount in the market."

As well as safeguarding future valuations, the company will see production costs and emissions fall in line with a range of operational efficiencies: for example, it has slashed electricity consumption by investing in newer, more efficient smelters, while its move to a major industrial cluster in Yunnan enables it to sell 85% of its production as "hot metal delivery", avoiding the huge amounts of energy required to remelt it.

Circularity also plays a role: the company has a leasing deal on cargo-freight EVs which enables them to recover the vehicles and their valuable scrap aluminium at the end of each truck's working life. Put together, these initiatives will help the company reduce its carbon emissions by 30-40Mt by 2030 – more than all FMC members combined, pointed out the advisor.

> **Low-carbon is going to become the norm. If you're high-carbon, you're going to get discounted – good luck to you. Not this year, or next. But very soon – extremely quickly in some markets.**
>
> Senior advisor to the chair of a Chinese aluminium producer

Commitment to low-carbon pathways was a theme that resonated throughout the meeting, which saw buyers and suppliers reaching out to meet the decarbonization challenge together at a supply chain level. A Scandinavian aluminium producer spoke about how, in targeting sub-3 tonnes of emissions per tonne of metal by 2030, his company is enhancing the wider value of the materials sector. He addressed everyone at the meeting when he said: "We need to be committed to zero carbon on both ends – as buyers and as suppliers. We as a group need to demonstrate we can do this."

Demand is growing – from hyperscalers and low-carbon leaders

The mood among suppliers is surprisingly positive on demand. A major steel manufacturer from North America pointed to consistent demand growth for premium, low-carbon steel from hyperscalers in the US. With the prevalence of cost-effective scrap-EAF steel already in the US, "we can create a truly green product", he said.

A representative from a Nordic low-carbon steel manufacturer agreed that demand is growing. He pointed out that his company offers not just a procurement choice, but a combined offer. For most of his customers, the largest part of their carbon footprint is steel. So switching to a low-carbon alternative could cut 30-50% of their emissions with one decision.

> **Demand is growing, we can be clear about that. It may be moving at different paces across the world, but demand growth is there. We have a choice: we can take the lead or we can wait.**
>
> Participant from Nordic low-carbon steel manufacturer

Faster permitting is critical for cashflows

For the European company seeking FID on an H2-DRI plant, permits are more of a concern than offtake. There is a high risk of litigation on applications that can take time to settle; and this risk applies not only to permits for company installations but also for the electricity supply infrastructure for the entire industrial zone on which the project depends. “We need to know how long it will take – that is critical,” said the participant, calling on his government to set a maximum duration to any such permitting litigation.

The Nordic steelmaker agreed that permitting remains one of the biggest problems in Europe: “The average timeline to get permits for power lines is 14 years – it’s embarrassing!” China, by contrast, is much faster in awarding permits and implementing projects, giving them a stronger market position.

Delays to permitting, often lasting years, feed directly into the bankability of first mover projects, according to Eneida Licaj, who leads the finance pillar for FMC. “This uncertainty means they don’t know when they can deliver on their offtakes,” said Licaj. “That changes their revenues and has a big impact on cashflows, leaving a huge gap between what they’ve promised investors and what they can actually deliver. It also makes it hard to take on fixed debt.”

Offtake alone won’t move the market – government support is also needed

When it comes to offtake, the FMC is the world’s leading initiative to aggregate advance demand for low-emissions materials. Offtakers will need to keep committing long-term to provide security for investors and producers; FMC’s role in bringing the ecosystem together to make this happen was appreciated by participants.

However, as one keynote speaker on the buyers’ side made clear – it will take more than just offtake to move the market. It is also critical that governments invest in developing and scaling-up breakthrough technologies, along with the green energy infrastructure to power them. Meanwhile, on the production side, greater innovation is needed to cut costs.

> **It is clear that offtakers cannot do this alone. To bring the green transformation forward, we will need help from governments to invest in R&D of nascent technologies, and to continue investing in scaling-up technologies and the infrastructure required. Meanwhile, technology providers will need to innovate to improve processes and reduce costs.**
>
> Participant from consumer goods company

Several examples of direct state support for European producers of low-carbon metals stand out, with public sector aid – both European and international – extending to direct grants, concessional loans and loan guarantees to cover a proportion of private debt in the event of a default (see Box 5 and Table 1).

BOX 5 | State aid and offtake both play critical roles in European low-carbon metal projects

Two high-profile European green hydrogen-powered, low-carbon metal projects – Stegra and GravitHy – have got off the ground thanks in part to well-timed support from governments across the world.

GravitHy – 2 million tonne green H2-DRI plant

In March 2025, the Japan Hydrogen Fund (JHF) committed to invest in Paris-based GravitHy's proposed green hydrogen direct reduced iron (H2-DRI) plant at Fos-sur-Mer in southern France. The project, with an overall capital investment of €2.2 billion, is designed to produce 2Mt of low-carbon direct reduced / hot briquetted iron (DRI/HBI) annually. The project, which aims to start operating in 2029, will feature a 750MW electrolyser – one of the largest in the world – powered mainly by the local, low-carbon French nuclear grid. The process is expected to cut CO_2 emissions by up to 90% compared to the traditional BF-BOF process.

JHF – which is managed by Advantage Partners, one of Japan's leading private equity firms – is the first Japanese fund dedicated solely to the development of low-carbon hydrogen. Launched in September 2024 alongside the Japan Hydrogen Association (JH2A), the fund raised over $400 million at its first close from investors.

JHF's ability to commit capital to a large-scale, innovative European infrastructure project was underpinned by Japanese government subsidies and loan guarantees.

Stegra (formerly H2 Green Steel) – 2.5 million tonne green flat steel plant

Stegra is promoting a €6.5 billion H2-DRI-EAF project to produce 2.5Mt of green flat steel in the first production stage, expanding to a full design capacity of 4.5Mt at a later stage. Based in Boden, northern Sweden, it will make its own green hydrogen to reduce the iron ore and power its electric arc furnace with renewables to reach FMC's low-carbon threshold.

Alongside private equity and debt, the project has attracted significant state support, including a grant of €265 million pledged by the Swedish government (although roughly half was delivered) and a €250 million grant from the EU Innovation Fund. The project also secured concessional debt from the European Investment Bank and €2.4 billion of loan guarantees from Swedish and German government-sanctioned agencies. In April 2026, Stegra secured a further €1.4 billion from a consortium led by the renowned Swedish Wallenberg family that includes support from Singapore government investor Temasek.

In an interview for this report, Ola Hansén, public affairs director at Stegra, highlighted the fundamental role that Sweden's domestic resources of hydro and wind power play in protecting the company from price fluctuations based on Middle Eastern supply. Hansén added that the company had secured more than 50% of its initial annual production capacity for a period of seven years, under long-term binding offtake agreements that included a green premium. "The ability to show demand was critical to triggering FID," he said.

Source: see endnotes.[18,19]

TABLE 1 **Public sector grants for selected European low-carbon iron and steel producers**

Project	Country	Location	Year approved (EC/local govt)	Funding (€ Bn)	Technology	Project status
ArcelorMittal[1]	DE	Hamburg	2023	€0.06 Bn	DRI	DRI on hold
Salzgitter	DE	Salzgitter	2022	€1.32 Bn	DRI-EAF	1-2 year delay
Tata Steel	NL	Ijmuiden	Not yet received EC approval	€2.3 Bn*	DRI-EAF	EC approval pending, project on time
Tata Steel	UK	Port Talbot	2024	€0.6 Bn	EAF	Project on time
ArcelorMittal	BE	Ghent	2023	€0.28 Bn	DRI-EAF	DRI on hold, EAF moving forward; funding terms under review
ArcelorMittal	FR	Dunkirk & Fos-sur-Mer	2023	€0.85 Bn	DRI-EAF	DRI on hold, EAF moving forward; funding terms under review
ArcelorMittal	ES	Gijon	2023	€0.46 Bn	DRI-EAF	DRI on hold, EAF moving forward, funding terms under review
Hydnum Steel	ES	Puertollano	2025	€0.06 Bn	DRI-EAF	Project on time
LKAB HYBRIT	SE	Gällivare	2023	€0.41 Bn	DRI	1-2 year delay
Stegra[2]	SE	Boden	2024	€0.52 Bn*	DRI-EAF	Project progressing, funding partially on hold
SSAB	SE	Luleå	2024	€0.13 Bn	EAF	1-2 year delay
Thyssenkrupp	DE	Duisburg	2023	€2.0 Bn	DRI-EAF	1-2 year delay
ArcelorMittal	DE	Duisburg	Not yet received EC approval	€0.3 Bn*	EAF	Funding not yet approved, project delay
Stahl-Holding-Saar (SHS)	DE	Dillingen & Völklingen	2023	€2.6 Bn	DRI-EAF	2 year delay
ArcelorMittal	LU	Esch-sur-Alzette	2023	€0.02 Bn	EAF	Project on time
GravitHy[3]	FR	Fos-sur-Mer	2025	Undisclosed government support	DRI/HBI	Development, FID targeted 2026

Notes: * Project not yet approved/under review. **1.** ArcelorMittal has postponed the majority of its planned investments amid higher capital and operating costs, slower-than-expected green hydrogen rollout, limited green steel premiums, and ongoing policy and trade uncertainty. **2.** While Stegra's project continues to progress, a portion of the €265m pledged in Swedish state aid has not yet been disbursed (see Box 5). **3.** GravitHy was selected under the France 2030 "Première Usine" programme. Its €60 million funding round included an undisclosed amount of public support from the French government, but it is not directly comparable to larger EC-approved, state-aid or capex grant packages.

Source: Boston Consulting Group, May 2026.

Innovative private sector finance offers solutions for producers

Promoters of innovative low-carbon technologies need to seek equally innovative private sector finance solutions to help their projects reach commercial viability.

The roundtable heard from a senior banker in J.P. Morgan's debt capital markets division, who highlighted the demand – especially from pension funds – for sustainability bonds and sustainability-linked debt. "We are packaging up a sustainable development story and selling in a language investors can understand," he said.

While the first priorities for such investors are to protect their capital and generate returns, they would also like to support sustainable development. The result is a product with a very safe credit rating of AAA to BBB, more suitable to support highly rated incumbents than pioneers.

The next challenge is to take such investment-grade debt instruments and apply them to higher risk areas of the market that are traditionally supported only by equity. This requires companies to build a profile to attract fixed income investors and other lenders – such as through offtake agreements and otherwise predictable cashflows.

> **There are no short cuts. It's about generating a track record in the market that proves your business model can pay down the debt.**
>
> Senior banker in J.P. Morgan's debt capital markets division

One example of more innovative lending is the venture debt secured from J.P. Morgan by Electra, a near-zero emissions iron project (see Box 6).

Venture debt is typically provided to higher risk startups with a track record in raising venture capital (VC). This type of debt provides a funding option that provides additional liquidity between fundraising rounds, while avoiding the ownership dilution that comes with equity finance. Unlike traditional loans that rely on physical assets or revenues for collateral, venture debt is secured against the company's intellectual property or future revenues. To compensate for the risk, such debt usually attracts higher interest rates than traditional loans.[20]

BOX 6 Electra secures $30 million from J.P. Morgan to accelerate commercial production

While a traditional coke-fired blast furnace reaches temperatures of up to 2,300°C to smelt liquid iron from its ore, Electra has pioneered an electrowinning process powered by intermittent renewables such as wind and solar which removes iron from its ore at roughly 60°C – about the temperature of a cup of coffee.

The result is near-zero emissions iron that can be fed into EAFs to make green steel. According to Electra, its technology offers a low-risk route to commercial scale by the end of the decade that is compatible with diverse ore types and capable of delivering 99%-pure iron.

In the past year, Electra has unveiled its demonstration facility, signed advance purchase orders with leading steel industry partners and secured Series B financing as well as a grant from Bill Gates's Breakthrough Energy. The $30 million of new capital from J.P. Morgan comes in the form of a venture debt facility, which will support Electra's scale-up as the company prepares its first commercial clean iron facility.

> **Electra's clean iron will play an exciting role in meeting demand for industrial materials while reducing emissions. Their modular, electrowinning methods can accelerate time to market and lower upfront capex, helping scale the clean materials supply chain that underpins the energy transition.**
>
> Heather Zichal, Global Head of Sustainability, J.P. Morgan Chase

Source: Electra, J.P. Morgan.[21]

3

Buyer priorities: transparency on costs, risks and definitions

Buyers are calling for visibility on abatement costs and green premiums, as well as collaborative partnerships with suppliers, so risks can be shared along the full value chain.

Buyers highlighted persistent uncertainty around the shifting dynamics of production costs, green premiums and the value of low-carbon metals. Volatile geopolitics in recent years have further disrupted economic pathways for producers, buyers, supply chains and governments.

This chapter analyses buyers' principal concerns as well as ways to address them. Solutions include smarter design, innovative partnerships and – arguably the most important long-term solution – reframing the green premium not as an extra burden but as a legitimate cost for a higher-value product, which locks in not only climate benefits but also resilience to future regulatory and supply chain risks.

3.1 Buyers seek greater transparency

70%

of buyers said they could only pass through 0-30% of additional low-carbon costs to customers

Doubts in buyer's minds have crystallized around five key concerns:

- **Magnitude and duration of green premium**, how it is split across the value chain (between suppliers, buyers and end-users) and breakeven with conventional metals.
- **Underlying cost of emerging technologies**, distinct from any premium charged on top.
- **Effect of policy-driven carbon costs**, for example due to the EU ETS and CBAM.
- **Risk of insufficient supply** of low-emission metals and scarcity-driven price rises.
- **Lack of comparability** between suppliers' products, due to fragmented standards and methodologies on what constitutes "green" or "low carbon".

> **Demand materializes when the economics are transparent.**
>
> Boston Consulting Group

It is well established that producers of low-carbon and near-zero metals need to demonstrate secure, advance demand or offtake for their materials before financiers will commit to any infrastructure-related final investment decision. But for buyers to commit to advance demand, they need to trust that the pricing methodologies built into any offtake agreements reflect the realistic cost of production. Buyers at the roundtable made clear that this trust can only come about through greater transparency on production costs and greater rigour in defining the emissions profile of a given product.

One key challenge is the different ways in which steel and aluminium are traded and priced. Steel prices are more closely linked to cost and buyers are often able to negotiate directly on price with suppliers. However, aluminium is a globally traded metal where the spot price in the market reflects a willingness-to-pay rather than the cost of production. Organizations such as the London Metal Exchange (LME) and Fastmarkets include various add-ons when reporting the price of low-carbon aluminium, including a regional premium and a green premium, which push the cost up (see Chapter 4).

As one participant from an auto manufacturer put it: "With aluminium, we have no information on the actual cost of production and we can't negotiate

with suppliers directly, because they always hide behind the markets and indices like the regional premium and now the green premium."

A common concern voiced by buyers is that customers and end-users are not willing to pay a green premium for low-carbon metals. The global energy crisis and supply chain disruptions triggered by the crisis in the Middle East have deepened this concern.

A Mentimeter survey conducted by FMC after the roundtable found that buyers rated customers' unwillingness-to-pay as their number one constraint to increased sourcing of low-carbon metals, along with the green premium. Among respondents, 70% said they could only pass through 0-30% of additional low-carbon costs to customers – and none of them passes through more than 60% of costs.

Buyers emphasize that – without transparency on the technology costs for producing low-carbon metals, as well as the likely evolution of carbon prices – they will struggle to establish their breakeven points or determine when it becomes cheaper, for example, to pay for green materials rather than pay a carbon tax.

> **We need to balance technical innovation and commercial reality – these products cannot come at any cost, they have to be competitive.**
>
> Marc Delobelle, Head of Fossil-Free Materials Purchasing, Volvo Group.

3.2 Reducing risks and costs – innovative approaches

Smart efficiencies in design, procurement and circularity

In the absence of end-users willing to pay the green premium, companies need to look for reductions in CO_2 and cost at the same time. Some are finding efficiencies within existing systems to make the numbers add up, such as designing out excess weight of metal or using more recycled and scrap content. "The biggest gains come from close collaboration with suppliers," said one participant from the European building materials industry.

Designing out primary aluminium in favour of using more scrap is not just a green argument – it makes very good business sense. "We can reduce our material costs by using more scrap and recycled content than using primary, so there are great benefits on costs and sustainability," said one US aluminium producer, adding: "Get to the financial carrot to open up the sustainability conversation."

Scrap aluminium can cut costs and emissions

Circularity is an important solution to reduce emissions and costs simultaneously. One powerful idea raised at the roundtable to improve the efficiency of circularity is to cut out the middlemen. Currently the scrap aluminium market sees multiple trading exchanges between recyclers, sellers, aggregators and buyers. However, an aluminium rolling company, for example, could approach its customers directly and buy back the scrap they are generating. The customer would get paid more and the manufacturer would procure cheaper scrap of known quality to melt and roll into new low-carbon aluminium. "This is a wonderful 'close the loop' story that could cut emissions by 95%," added the aluminium producer.

Nevertheless, while this disintermediation model is compelling, scrap traders currently perform aggregation, grading and quality assurance functions – especially for scrap of unknown provenance – that would need to be internalized in any direct-to-consumer loop. Meanwhile, companies will need to invest in new melters for that scrap – a financial outlay which in turn needs support from green premiums. "We're starting to have those conversations," said the US producer, "but we have not yet found one customer willing to pay a low-carbon premium – while they still want on-time supply." In his view, the only way to make this pathway viable is to share the cost across the supply chain.

> **We need to feel like there is a pull from the customer base – we can share it, but it can't just be us absorbing all this cost.**
>
> US aluminium producer

In March 2025, the European Commission published its Steel and Metals Action Plan, which proposes targets for recycled steel and aluminium in key sectors. The Commission is looking to tweak its CBAM calculations to incentivize the use of domestic steel and aluminium scrap in Europe, which to date has been exporting large quantities of its high-quality scrap to Türkiye, China and India, among other countries.

However, retaining high-quality domestic scrap only delivers circularity benefits if matched by sorting and remelting capacity. Without investment in collection and processing infrastructure, export restrictions risk creating a scrap surplus that

> One solution is to reframe the conversation on the green premium as an investment in added value, resilience and risk mitigation – rather than as a cost.

gets downcycled rather than kept in high-value loops. Equally, true circularity depends on using post-consumer scrap – which has already served a useful life in vehicles, buildings, packaging or electronics – rather than pre-consumer scrap, such as rolling offcuts that never leave the factory and are already widely recycled.

Innovative partnerships and agreements can reduce shared risk

Buyers and suppliers at the roundtable acknowledged that a transactional business-as-usual approach to procurement will not be sufficient to accelerate production of low-carbon metals to the volumes required. Rather than simply demanding price parity with existing materials, buyers demonstrated a willingness to explore deeper partnerships and more innovative business models. In complex supply chains, partnerships between buyers and suppliers can help overcome the challenges of finding where emissions are highest and building transparent data sources to track those findings.

Collaborative business models between buyers and suppliers can help spread the risk of developing breakthrough technologies. One approach is direct investment by end-users in production plants, carrying with it potentially preferential access to low-carbon materials at competitive prices in the future. For example, Apple invested 13 million Canadian dollars in Elysis, a joint venture between Rio Tinto and Alcoa to smelt near-zero aluminium, supported by the governments of Canada and Quebec.[22]

Offtake agreements are vital for bankability

Long-term offtake agreements are a more widespread approach. Typically, a buyer will commit to a specific volume of an agreed grade of low-carbon metal by an agreed future date. The price may not be agreed in advance, but the methodology for calculating the price at the time of sale will be. For producers looking to raise investment in a new low-carbon steel or aluminium plant, such offtake agreements are often the single most significant factor in building a bankable business case that leads to a final investment decision. For a major project, it is not unusual for investors to require over 50% of initial production capacity to be secured in advance through long-term offtake agreements.

When buyers commit to such an agreement, they calculate that the risk of agreeing years ahead to purchase a particular quantity of material at a mutually agreed price is less than the risk of not being able to secure that material at the volume, cost and time that they need it – for example, if tighter European regulations and scarcity of supply drive up prices. “We are securing the future”, is how one buyer put it.

By being flexible with long-term purchase agreements, first movers can further reduce producer risk. For example, buyers can maximize the impact of their long-term offtake by synchronizing agreements with suppliers’ investment milestones. One participant suggested including clauses in offtake agreements to hedge clean energy prices – if they go up, the buyer could pay more; if they go down, the raw material cost could be less.

Green procurement can help deliver economic returns, resilience and climate goals

Chief procurement officers have a key role to play, as detailed in a World Economic Forum report, *Green Procurement Playbook: The CPO's Guide to Delivering Value for Business and Planet*, published in October 2025. In many sectors – especially transport, food and beverage, capital goods and construction – scope 3 emissions account for over 90% of corporate greenhouse gas emissions, with a significant share coming from upstream purchased goods. The report argues that this places procurement leaders in a unique position to transform strategy across supply chains, enabling CEOs to accelerate progress on climate goals, reduce supply chain risk and future-proof the business.

> **The companies moving fastest are those where sustainability is not a side project, but built into how decisions are made across the business.**
>
> World Economic Forum, Green Procurement Playbook, October 2025.[23]

Volvo Group – a signatory to FMC's steel and aluminium commitments – embodies this forward-looking attitude to procurement. In a recent article, *Showing their metal: how early adopters are accelerating heavy industry decarbonization*,[24] Marc Delobelle, Head of Fossil-Free Materials Purchasing at Volvo, wrote that being a first mover means to "go beyond traditional procurement by actively supporting innovation from suppliers and startups, and testing new technologies and business models that value CO_2 reductions explicitly."

Reframe the value of "green" in terms of resilience and future-proofing

Convincing boards

One solution in response to the reluctance of buyers and end-users to pay higher prices for low-carbon metals is to reframe the conversation on the green premium as an investment in added value, resilience and risk mitigation – rather than as a cost.

A European procurement leader at the workshop challenged the narrow view of "price today" by emphasizing the longer-term "resilience dividend", which comes from lowering exposure to future carbon costs, increasing access to green finance and fulfilling customer demand.

Given the analysis in the previous chapter of rising costs in Europe for carbon-intensive metals, along with projections of a ~11 million tonne annual shortfall in low-carbon steel within the next decade, moving proactively to secure future offtake could make strategic sense. Much comes down to reframing the procurement calculus. As one buyer at the workshop put it: "When the total cost of ownership includes future CO_2 prices and compliance risks, low-carbon metals often become the prudent bet."

A procurement leader from the US agreed: for most people in procurement, "low carbon hasn't yet entered their thinking", he said. He too urged the conversation to move out of the sustainability silo and into a wider understanding of value.

> **We've got to expand beyond cost, quality and on-time – and talk about creating value in sustainability.**
>
> US leader in metals procurement

Convincing customers

While regulation in Europe will encourage "greener" materials in vehicles, businesses at the customer-facing end of the supply chain – such as automotive and consumer goods – need transparent and verifiable ways to demonstrate customer value for sustainable materials.

Getting the communication right with customers is critical – because there is a difference between a technology "cost" and a "premium". One German tier one supplier to the auto industry said: "If I talk about a premium, the buyer thinks they are getting ripped off."

Educating consumers is essential. Electric vehicles are in the vanguard of persuading people that "going green" can deliver a better experience, while working for the wallet and the planet. Now, said a European vehicle manufacturer, "we need to educate them that low-carbon metal in a chassis is also good for the planet and worth paying a premium for".

Organizational change

Internal carbon price – an investment in learning

Voluntary carbon pricing can help companies prepare for a mandatory future. One participant from a Swedish company specializing in industrial-scale fluid handling explained how her company is aiming to halve its scope 3 emissions by 2030 on its way to net zero by 2050, through reducing the emissions footprint of steel used in its products. She too does not yet see any customers willing to pay a green premium, but her company has set its own internal carbon price, which enables it to compare the cost of procurement between low-carbon and emissions-heavy steel suppliers.

Given their emissions targets, the company has absorbed the green premium itself, for now. "This was an investment in learning," she said, adding: "We have learned so much just by jumping into buying low-carbon materials." But she concedes her company will have to find ways to recover the cost. The key is around how the company communicates with its customers: "We have a lot of good stories – we need to show them the benefits."

Company bonuses for sustainability

No one at the roundtable believed the cost of decarbonizing industry could be fully landed on the doorstep of the wider public – whether the final cost to a consumer product is an extra €400 for a car or €30 for a fridge. "Just passing this cost onto society – I'm convinced this will not work," said the German tier 1 supplier to the automotive industry. He called on everyone in the supply chain from producers to manufacturers to buyers to find ways to absorb the cost – something he believed would become more possible as volumes scale up.

Some customers are starting to move: a handful of Western auto-makers have committed to become carbon neutral, while a vehicle manufacturer in Japan offers its employees a bonus for hitting sustainability targets – but only if they can maintain the same price.

4 Market transparency and pricing evolution

Markets apply green premiums in metal trading, but concerns remain they reflect willingness-to-pay rather than the underlying costs of decarbonization.

The FMC's metals roundtable dedicated a session to explore why low-emissions metals markets remain opaque despite rising demand. Most of this chapter focuses on aluminium – traded globally as a commodity to a greater extent than steel, which is more often traded through direct negotiations between buyer and producer.

Speakers from a leading metals exchange and a price reporting agency addressed the roundtable with their analysis of a range of factors, including:

- Inconsistent certification frameworks
- Varying traceability standards
- Evolving price-setting mechanisms
- Uncertainty around green premium durability

4.1 Understanding price layers in global aluminium trading

Green premiums are particularly opaque for aluminium, as primary aluminium is more widely traded at a global level than steel. In particular, buyers are concerned that green premiums in metals trading reflect current demand-supply scarcity and willingness-to-pay, rather than the underlying costs of producing decarbonized metal (see Figure 8).

As a result, buyers fear a risk of overpayment when relying on these premiums – especially when producers are already making low-carbon aluminium by benefitting from existing high-volume hydro-power (e.g. in Quebec, Scandinavia) and low energy prices (e.g. in the US).

Equally, however, producers are concerned that the current – in their view minimal – green premiums for low-carbon metals do not reflect the abatement costs for production plants that rely on high-emissions baseline energy sources, or the capital costs of investing in new low-emissions technologies.

The green premium, reported by organizations such as London Metal Exchange (LME), Fastmarkets or S&P Global Platts, sits on top of other differentials such as regional premiums, billet shape/product premiums and freight differentials. As a result, buyers aiming to price in low-carbon aluminium based on a production cost-plus basis can find it difficult to determine whether or not they are paying over the odds for their supply.

This stacking or layering of aluminium pricing is outlined in Table 2, with approximate percentage values per layer. It is striking that the green premium or "low-carbon differential" for aluminium amounts to just $0-30 per tonne, up to ~1% of the all-in market price.

FIGURE 8 **How green premiums work in global metals trading markets**

Green premiums are needed to incentivize decarbonization for producers, although they currently reflect executed market transactions only

Agencies introduce green premiums...

- Fastmarkets and Platts (S&P) first introduced aluminium green premiums and differentials in 2021 to provide price transparency.
- Green premiums come on top of LME's benchmark and other differentials (e.g. regional premiums, brand/billet premiums, freight differentials).
- New or additional green premiums and differentials were introduced in the US, Europe, Mexico, Japan and South Korea during 2023-2025.

S&P Global Platts · Fastmarkets MB · harbor · LME An HKEX Company

...to provide transparency for buyers

- Buyers use green premiums as a market-access and benchmarking tool to secure low-carbon volumes and reference prevailing willingness-to-pay.
- Pricing of green premiums is derived from executed market transactions and therefore reflects current demand and supply scarcity and willingness-to-pay.
- Low-carbon premiums are not directly based on production costs and provide no visibility of decarbon-ization technology and amortization profiles.
- Buyers might fear a risk of overpayment above actual production costs when relying on these premiums.

Source: First Movers Coalition and Boston Consulting Group.

TABLE 2 **Aluminium pricing layer analysis: European billet buyer (normal market conditions)**

Component	% all-in price	Notes
1. LME benchmark 3-month cash price, P1020A	~78-82%	– Global reference benchmark price for standard P1020A-grade primary aluminium (99.7% purity). – During 2025, aluminium traded at an LME benchmark of between ~$2,400 and $2,900/t.[25]
2. Regional premium e.g. Rotterdam DP in-warehouse	~5-10%	– Reflects real-world cost of physically delivering aluminium to a specific region – covering logistics, import duties, warehousing and local supply/demand imbalances. – The three main benchmarks are: US Midwest premium, European duty-paid (DP) premium, Japanese premium. Buyers can also opt to buy the metal duty-unpaid (DUP). – Fastmarkets' twice-weekly P1020A regional premium (in-warehouse DP Rotterdam) was $210-235/tonne on 2 September 2025.[26] Since 1 January 2026, this premium includes EU CBAM costs, which resulted in an increase in prices in Q1.
3. Billet shape premium e.g. 6063 extrusion billet over P1020A	~8-14%	– Reflects transformation of standard P1020A into "value-added products" required by manufacturers (e.g. for 6063-series extrusion billet used by window-frame, automotive and construction extruders). – Range reflects normal European market, delivered duty-paid North Germany (Ruhr region), ranging from $345-560 (2023-25).
4. Low-carbon differential e.g. ≤4 t CO_2e/t, scope 1 & 2	~0-1%	– This differential reflects a premium for aluminium meeting specified carbon-intensity thresholds and is assessed separately from the underlying aluminium price and other physical market premiums. – For example, Fastmarkets' low-carbon differential for P1020 aluminium (≤4 tCO_2e/t, scope 1 & 2) has ranged from $0-30/t in Europe since its launch in 2021; liquidity is limited and buyers often resist paying; offers are occasionally seen up to $50/t.[27] – Note this "green premium" does not meet FMC's strict criteria of ≤3 tCO_2e/t (scope 1, 2 & 3).
5. Freight component e.g. Middle East/ Canada to Rotterdam	~1-2%	– These can either be embedded within regional premiums or separately identified. Shipping costs between e.g. Middle East-Rotterdam or Iceland-Japan will vary depending on routes, market conditions and supply chain disruptions. – Estimated $30-$80/t for longer-haul origins (e.g. Middle East, Canada). Rerouting via Cape of Good Hope (due to Houthi attacks) raised costs sharply in early 2024 and again in early 2026.[28]

Notes: All prices and percentages are indicative and reflect normal market conditions before the elevated/disrupted levels of 2026. This table refers to Fastmarkets' low-carbon aluminium differential. Other sustainability-related pricing mechanisms also exist, including the LME Sustainable Metal Premium – a separate pricing mechanism that currently references ≤8 t CO_2e/t (scope 1, 2 & upstream scope 3 emissions) but which takes into consideration a broader set of sustainability metrics beyond just carbon by requiring an ASI certification too.

Source: Westmetall, Fastmarkets, Boston Consulting Group, S&P Global.

4.2 Varying emissions thresholds add opaqueness and complexity

Complications arise as multiple price-reporting agencies publish low-carbon aluminium premiums or differentials, including Fastmarkets, LME, S&P Global Commodity Insights/Platts, Argus, CRU and SMM (see Table 3). Premium levels, emissions boundaries and qualifying criteria vary by provider, for example:

– **LME's** planned "sustainable metal premium" is set at a benchmark of **under 8 tonnes** of CO_2e emissions per tonne of primary aluminium (tCO_2e/t Al). This benchmark adopts the cradle-to-gate methodology of the International Aluminium Institute (IAI), which includes scope 1 and 2, plus all upstream scope 3 emissions.

– **Fastmarkets** defines low-carbon aluminium as **under 4 tonnes** of CO_2e emissions (smelter-level scope 1 and 2 only, excluding any scope 3).

– **FMC** defines low-carbon aluminium as **under 3 tonnes** of CO_2e emissions (as per IAI's cradle-to-gate methodology: scope 1 and 2, plus upstream scope 3).

As seen above, the green premium for Fastmarkets' low-carbon aluminium is relatively low, having stabilized at ~1% of all-in price or less. This is due to several factors:

- Plenty of aluminium supply in Europe and North America is powered by renewables and already meets a threshold of 4-5 tCO_2e/tAl. Suppliers have therefore not had to make major decarbonization efforts, with the related cost pass-throughs those would entail.
- Producers are reluctant to impose extra costs onto customers, given the high LME price and premiums due to tariffs, geopolitical disruptions and associated logistical challenges.

However, this 1% premium does not represent the cost of producing FMC-compliant low-carbon aluminium. To achieve this level of decarbonization requires breakthrough technology that goes beyond simply using renewable power (see Box 7).

TABLE 3

Leading low-carbon aluminium premiums, with emissions thresholds and boundaries

Most premiums define a threshold of <4t CO_2e/tAl (smelter-level scope 1 & 2) – although variations complicate comparability. FMC's threshold is <3t CO_2e/tAl (scope 1, 2 & 3)

Premium /Index	Regional coverage	Emissions threshold (tCO_2e/tAl)	Boundary for threshold
Low-carbon aluminium differential	EU, US, Mexico, East Asia	**<4.0**	Smelter-level scope 1 & 2; excludes any scope 3
Low-carbon aluminium premium	Europe – Rotterdam	**<4.0**	Smelter-level scope 1 & 2; excludes any scope 3
Zero-carbon aluminium premium	Europe – Rotterdam	Derived from LCAP	LCAP material (<4 t) plus cost of offsetting remaining emissions
US-LCAP Low-carbon aluminium price	US Midwest	**<4.0**	Smelter-level scope 1 & 2; excludes any scope 3
Green/low-carbon aluminium upcharge Product-specific	US	**<4.0** (historically 4.5)	IAI methodology level 1: smelter-level scope 1 & 2 plus anode production and casting; excluding alumina/bauxite
European low-carbon aluminium premium	Europe	**<4.0**	Smelter-level scope 1 & 2 plus selected scope 3 (third-party anodes)
Low-carbon aluminium premium index	China	**<7.0**	Cradle-to-grate per Chinese National Standard GB/T 44905-2024[1]
Sustainable metal premium	Global	**<8.0**	IAI methodology (cradle-to-gate emissions including scope 1, 2 & all upstream scope 3)[2]

Smelter-level scope 1 & 2 | Smelter-level scope 1 & 2 with selected upstream scope 3 emissions | Smelter-level cradle-to-gate (scope 1, 2 & upstream scope 3)

Notes: 1. Includes emissions from bauxite mining through to alumina production, pre-baked anode production, electrolytic aluminium production and casting; also includes upstream auxiliary materials, energy production and transport.
2. The IAI specifies a cradle-to-gate approach to assess a product's carbon footprint from raw material extraction until it leaves the factory. It includes all direct and indirect emissions from each upstream unit process involved in the production of primary aluminium (see Box 7).

Source: Company websites; Boston Consulting Group analysis, 2026; IAI.[29]

According to the IAI, "across the aluminium industry... there is a lack of consistency regarding what is being included in the carbon footprint."[30] The thresholds declared in the markets often do not include upstream scope 3 emissions, thereby omitting the highly carbon-intensive process of refining bauxite ore into alumina – which precedes aluminium smelting. The thermal energy demand for this upstream phase accounts for around one-third of the aluminium industry's GHG emissions.[31]

BOX 7 **A tale of three scopes: the meaning of cradle-to-gate**

The FMC's threshold for low-carbon aluminium is under three tonnes of CO_2e per tonne of raw aluminium produced. This is based on the emissions methodology of the International Aluminium Institute (IAI), which includes scope 1, scope 2 and upstream scope 3 emissions – also known as cradle-to-gate emissions. Critically, upstream scope 3 covers the mining and (typically carbon-intensive) refining of bauxite into alumina – an essential step before the alumina can be smelted into aluminium.

Cradle-to-gate encompasses GHG emissions across all upstream processes, "including [bauxite] mining, refining, anode production, electrolysis and casting; including GHG emissions from electricity, direct emissions, GHG emissions from thermal energy, transport and ancillary materials, aligned with IAI's Carbon Footprint Methodology. Primary aluminium with such low carbon footprint would likely be accomplished using breakthrough technologies, such as inert anodes, CCUS, green hydrogen, mechanical vapour recompression (MVR)."

Source: International Aluminium Institute.[32]

> The thermal energy demand for upstream refining of bauxite ore into alumina accounts for around one-third of the aluminium industry's GHG emissions.

Defining emissions thresholds – sustainability vs. liquidity

An interesting discussion emerged during the roundtable about the pros and cons of different emissions thresholds. One participant expressed concern at how vetted these benchmarks are – for example, do the markets simply rely on producers self-testifying their emissions levels in the absence of certification? Furthermore, how can this emissions data be trusted without transparency on the GHG scopes included?

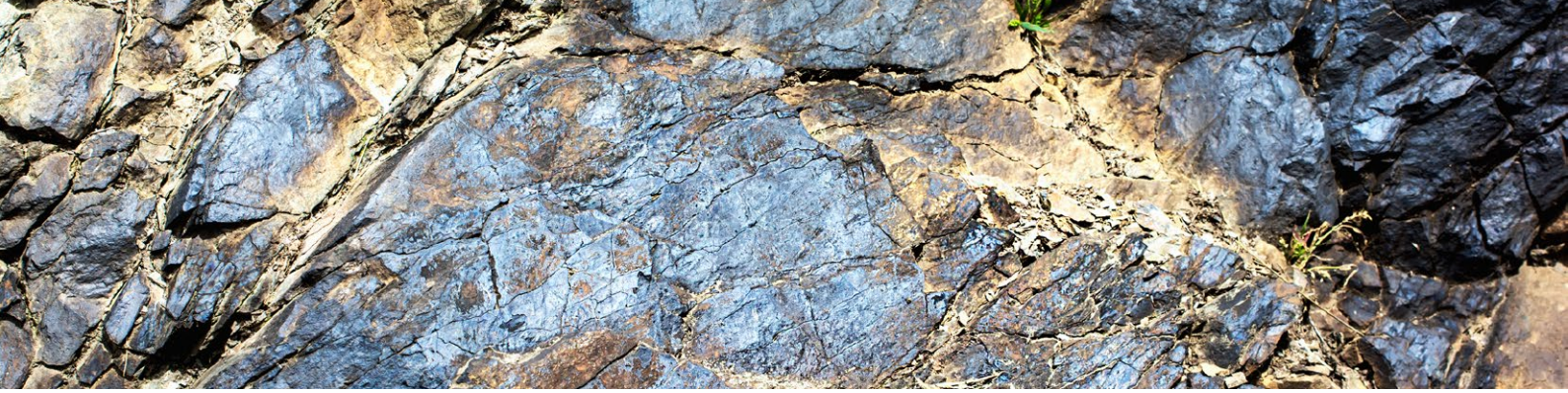
Several buyers saw no reason to pay any premium at all for 4 tCO_2e aluminium, since that is already close to the standard product offered by producers using hydro-power in the US and Europe. They argued that a green premium would only make sense for lower-carbon products that meet or exceed FMC's target of 3 tCO_2e for primary aluminium. "We should agree a definition of green, then the premium could be based on increments below that baseline," said one buyer, adding: "I'd be prepared to pay a premium on 2T aluminium but not on 4T aluminium."

Meanwhile, speakers at the roundtable maintained that the best way to achieve a fair green premium for a globally traded commodity such as aluminium is for the market to decide. But to do this, there needs to be sufficient liquidity – or volumes of trade – to determine that premium. The best way to increase that liquidity, said one of the analysts, is to start with an easier emissions threshold that "casts the net wide", encouraging more suppliers and buyers to participate, and then tightening that net over time. The LME's 8 tCO_2e is a wide enough net to get the market started, then additional premiums can be added for different lower-carbon specifications.

The challenge is to "balance sustainability and liquidity, as those things are at odds", said the speaker. In October 2025, LME had originally announced a threshold of 10 tCO_2e, but during consultation on this position, a number of respondents indicated that this threshold did not sufficiently incentivize decarbonization, so in February 2026, LME revised the threshold to 8 tCO_2e "to provide clearer sustainable differentiation while preserving sufficient eligible volumes to support robust price assessment".[33]

> **If you want to get something standardized, you need liquidity.**
>
> Participant from commodity trading company

One buyer made the point that encouraging higher-volume trade in sub-8-tonne aluminium could contribute more materially to global emissions reduction than low-volumes of trade in the more stringent sub-3-tonne aluminium advocated by FMC. This is because by far the largest supplier of primary aluminium is China, which still depends heavily on coal to smelt its metal, leading to average total emissions for its aluminium of ~17-18 tCO_2e/tAl.[34]



Agreeing a common methodology to measure emissions is critical

There is a growing consensus around the need to agree on a common methodology to define any product's carbon footprint. While thresholds may vary, as different buyers will want to buy different grades of product, the criteria used to measure those thresholds should not vary. Participants agreed that the low-carbon metals community needs to decide on emissions boundaries – smelter-level scope 1 and 2 only, or scope 1 and 2 plus selected scope 3 factors (e.g. anode production, casting), or full scope 1, 2 and upstream 3 emissions (cradle-to-gate).

The roundtable heard from a representative of the International Standards Organization (ISO) who highlighted several related issues, which resonate with the issues discussed above and contribute to a lack of trust in the market for "green metal" trading:

- There is no shared definition of "green".
- There is no common carbon accounting system.
- Companies report emissions at corporate, product and project level; those processes do not align, so the data is not comparable.
- Fragmentation at standards level is mirrored at systems level, with parallel documentation, certification and assurance systems that add to complexity and cost.

> **If you want to trade, you need to trust. If you don't agree on a definition, you cannot price it, you cannot trust it, you cannot trade and you cannot scale up.**
>
> Participant during market, pricing and standards session.

The wider goal of ISO is to spread the benefits of standardization, as harmonized standards and methodologies lower reporting burdens, reduce duplication and increase buyer and investor confidence. The organization has given itself two years to propose a shared definition for measuring carbon emissions, to enable alignment on reporting at corporate, product and project levels. It is working closely with Brazil's COP30 leadership, the International Energy Agency (IEA), World Trade Organization (WTO) and others to bring clarity to low-emissions standards.

Any efforts to standardize emissions measurement methodologies will need to take into account the work of existing bodies (see Table 4).

TABLE 4 **Organizations aiming to standardize data methodologies for low-carbon steel and aluminium**

Steel	World Steel Association
	Steel Standards Principles
	ResponsibleSteel
	Global Steel Climate Council (GSCC)
	China Iron and Steel Association (CISA)
	IEA, OECD Steel Committee and the Clean Energy Ministerial's Industrial Deep Decarbonisation Initiative (IDDI)
Aluminium	International Aluminium Institute (IAI)
	Aluminium Stewardship Initiative (ASI)
Cross-sector	International Organization for Standardization (ISO) and GHG Protocol
	Science Based Targets initiative (SBTi)

4.3 Factors affecting the evolution of green premiums

Lower-carbon steel premiums tumble as volumes remain nominal – but remain much higher than for aluminium

Europe

In Europe, demand for lower-carbon steel remains niche and fragmented, according to Fastmarkets, with buyers calling for clearer labelling and public procurement rules to support adoption. Fastmarkets' "green steel" premium for flat steel in Europe (defined as ≤0.8 tCO_2e per tonne of steel, scope 1, 2 & 3) has declined from a launch range of €200-300/tonne in mid-2023 to €125/tonne in early 2026, reflecting weak spot market demand and geopolitical headwinds.

Given that European hot-rolled coil steel (HRC) has traded at €560-720/tonne across 2025-26, even this lower green premium of €125/tonne represents 17-22% of the total cost per tonne – considerably higher than the ~1% green premium for aluminium.[35]

Premiums in Europe are higher in flats than longs as flat steel is more emissions-heavy, while long steel is already EAF-based and buyers resist paying extra for "already green" material. Amid the lack of a clear definition and standard for "green steel", 20-40% decarbonized steel remains the preferred choice for most spot buyers. Fastmarkets has produced its own emissions benchmarks to provide a price reference (see Box 8).

BOX 8 **Fastmarkets' lower-carbon steel snapshot**

Fastmarkets publishes a range of thresholds for lower-carbon steel, differentiated by market:

"Reduced carbon steel"

Flat steel Europe: 1.4-1.8 tCO_2e per tonne of steel produced, scope 1, 2 & 3

Flat steel Asia: 1.1-1.4 tCO_2e per tonne of steel produced, scope 1, 2 & 3

"Green steel"

Flat steel Europe: 0-0.8 tCO_2e per tonne of steel produced, scope 1, 2 & 3

Flat steel Asia: 0-1.3 tCO_2e per tonne of steel produced, scope 1, 2 & 3

Flat steel US: 0-0.7 tCO_2e per tonne of steel produced, scope 1, 2 & 3

Note: FMC's threshold for "near-zero emissions" steel adopts a sliding scale from <0.4 tonnes (0% scrap inputs) to <0.05 tonnes (100% scrap inputs) of CO_2e per tonne of crude steel produced.

Source: Fastmarkets, 2026.

Asia

In Asia, China is rapidly advancing the decarbonization of steel production, with many mills achieving 30-40% emissions cuts versus traditional BF-BOF output. Some producers are already meeting Europe's CBAM benchmarks. In recent months, according to Fastmarkets, lower-carbon steel producers in East Asia have maintained premiums of 20-40% over base prices for high-grade flat steel.

US

In the US, Fastmarkets' "green steel" premium has remained at $0/ton since May 2024.[36] This reflects the reality that, in the US, 72% of steel is already produced by the lower-emissions EAF route.[37] Given there is no major difference in the carbon footprint of this EAF steel and Fastmarkets' definition of "green steel", there is no appetite in the US to pay a green premium.

However, it is important to note that none of these steel products highlighted by Fastmarkets – whether "reduced carbon" or "green" – meet the rigorous benchmark of the FMC for its "near-zero emissions" steel, which adopts a sliding scale of less than 0.4 tonnes of CO_2e emissions (0% scrap inputs) down to <0.05 tonnes of CO_2e emissions (100% scrap inputs) per tonne of crude steel produced.

Appetite for premiums, risk-sharing and market direction – the traders' view

Participants from the metals trading sector shared their views and future projections with the roundtable. They agreed that a common definition of carbon emissions would greatly help in pricing the green premium. "To assess a price, we need to understand what the specs are; that's the tricky thing with low-carbon metal – there is no widely accepted definition," said one expert. While there is some acceptance in the market to pay a green premium for low-carbon P1020 aluminium, predominately from auto-makers and the packaging industry in Europe, "the real value is in the certification". Typically long-term contracts trade with higher low-carbon premiums than spot contracts.

> **It's very important to start splitting carbon costs from the green premium to get transparency.**
>
> Participant from commodity trading company

European regulation is making the market more complex, for both steel and aluminium. Steel producers using the scrap-EAF approach have been manufacturing lower-carbon steel for a long time; consequently there is no willingness to pay a green premium, according to a commodity trader at the roundtable.

Nevertheless, the imminent phase-out of free EUAs and the impact of CBAM are already pushing up prices. "Everyone is bearing some risk," said the trader – "but it's not transparent who is taking what risk or how much. The buyer is taking a lot of the cost impact – but suppliers are also absorbing some."

Mid-supply chain actors are also feeling the squeeze. One producer from Egypt attending the roundtable related how her company, which manufactures cold roll and galvanized steel, is facing a huge increase in cost for the hot rolled coil steel they have to buy in. Their markets in the Middle East, North Africa and Latin America are not prepared to pay a premium, while they have little idea what will happen in European markets after July, not just with CBAM but also with the new steel safeguards coming into play. "It's a very difficult situation," she said.

Looking to the future, market analysts believe that eventually the market, in Europe at least, will become lower-carbon emissions. Fastmarkets presented the roundtable with a range of forecasts up to 2035 (see Box 9).

BOX 9 **Fastmarkets' predictions for future low-carbon aluminium and steel markets**

Forecasts for low-carbon aluminium

- Increasingly valued as the world moves closer towards IEA's net-zero scenarios. Growth in demand is inevitable and likely to traverse traditional and emerging sectors.
- Given CBAM, countries supplying aluminium into Europe need to reshape their supply chains – challenging, given that geology and availability of green energy restrict the locations where aluminium smelters can operate sustainably.
- Its higher cost may not be acceptable for mass consumption, so it should be treated as a high-end premium brand.

Forecasts for low-carbon steel

- Green premiums will decline up to 2035, driven by structural supply shifts, increased demand for lower-carbon materials and tightening regulations.
- Key drivers will be rising carbon costs for domestic and foreign steel producers under Europe's ETS2 and CBAM, leading to greater cost convergence between production routes.
- Price premium for near-zero emissions steel (<0.4 tCO_2e/t steel) will fall from €139 in 2025 to €90 by 2035.
- Price premium for low-emissions steel (0.4 to 0.8 tCO_2e/t steel) will fall from €135 in 2025 to €49 by 2035.
- Volumes of decarbonized steel production will rise from 2025 to 2035:
  a. near-zero emissions steel from 0Mt to 6.3Mt
  b. low-emissions steel from 0.3Mt to 9.6Mt
  c. medium-emissions steel from 3.5Mt to 13.8Mt

Source: Fastmarkets, March 2026.

5 Conclusion and recommendations

FMC's roundtable provided a unique opportunity for buyers, suppliers, traders, financiers and government actors to share insights on how to grow the market for low-carbon metals.

Five commercial rationales driving demand and bankability

> Among participants responding to a poll after the roundtable, 74% were cautiously optimistic that their FMC low-carbon metals commitments are achievable.

Given prevailing economic and geopolitical conditions, participants attending the First Movers Coalition Metals Roundtable were surprisingly upbeat. In particular, suppliers reported that demand for low-carbon steel and aluminium continues to grow steadily. Among participants responding to a Mentimeter poll after the roundtable, 74% were cautiously optimistic that their FMC commitments are achievable.

There are headwinds, however. Buyers made clear that green premiums and the unwillingness of end-users to pay are their number one constraint to increased sourcing of low-carbon metals. Producers, meanwhile, made clear – as they have done consistently – that demand is the key ingredient in making their projects bankable.

So what will accelerate market demand for industrial materials that – on the face of it – do the same job and look the same as cheaper fossil-fuelled incumbents? Participants at the workshop highlighted at least five commercial rationales driving demand for low-carbon metals:

- **Ratcheting up of low-carbon regulation**: This especially applies to Europe, where carbon-intensive products will face mounting penalties under the phased removal of allowances under ETS and the parallel impact of CBAM on imports, from this year. The new Industrial Accelerator Act is expected to generate demand for up to 9 million tonnes of "low-carbon steel" per year, from 2028-29. Meanwhile, changes to the vehicle fleet regulation could increase annual demand for near-zero emissions steel by ~11 million tonnes by 2035.

- **Scoring big wins on industrial decarbonization**: Producers reported that there is strong demand from hyperscalers and industrial value-chain companies looking for big levers to reduce their carbon footprints, given steel and aluminium generate a large proportion of these companies' scope 3 emissions. Reasons cited in a Mentimeter poll of roundtable participants include, in order of significance: brand positioning, carbon price de-risking, access to new tenders and alignment to net-zero goals and disclosure requirements.

- **Securing future supply and competitiveness**: Some leading buyers, especially in the automotive sector, made the case that committing to long-term offtake agreements today is less risky than failing to secure low-carbon metals at the right price and volume in the 2030s, when regulation will be tightening, customer demand could be rising and a squeeze on supply seems likely. This rationale is supported by a Mentimeter poll of roundtable participants in which respondents framed the primary opportunity in sourcing low-emission metals as strategic positioning and long-term competitiveness, not compliance.

- **Reframing the green premium as investing in resilience**: Wars in Ukraine and the Middle East have focused minds on the risks of relying on geopolitically volatile regions for oil and gas, whose prices have soared in recent months. As mandatory emissions trading systems evolve, the price of carbon will become increasingly market-driven, forcing buyers to decide between paying the penalty or "buying green". Locking in supplies of low-carbon critical materials such as steel and aluminium may prove to be increasingly attractive and resilient choices.

- **Investment in future-proofing company valuation**: A growing number of players see low-carbon as the long-term future pathway for industry. While Quebec and Nordic countries have long led the world in hydro-powered metals production, China now is catching up. As one workshop participant said: "If you don't have a low-carbon future you're going to face a discount in the market."

Underlying all these rationales is a less tangible factor – trust. Buyers will not commit to purchase low-carbon metal unless they understand how its emissions profile is calculated and trust its certification. This requires urgent work to standardize global benchmarks and methodologies. Equally, buyers do not trust the way green premiums are calculated – they are asking for greater transparency around the costs of decarbonization.

The transparency that buyers are calling for on emissions and pricing is a prerequisite for building the trust they need to commit to the advance offtake that suppliers in turn need to make their projects bankable. Put simply – transparency leads to trust; trust is vital to build demand; and demand is a critical factor for bankability.

For suppliers, however, bankability is not only about demand – it is also about sharing and reducing risk. Lengthy permitting and drawn-out litigation are major risks for new-build projects, especially in Europe. Producers called on governments to take a more proactive stance in streamlining these processes against fixed timelines.

Governments – along with development banks – have an equally important role to play in building the capital stack needed to fund both the plants to produce low-carbon metals and the renewable energy infrastructure and grid connections to power those plants. Meanwhile, financial institutions have an opportunity to provide more innovative products such as venture debt and sustainability bonds to smooth the trajectory of low-carbon metals projects towards commercial viability.

This report has demonstrated how a combination of public grants, government-backed loan guarantees and concessionary loans can help crowd in the private debt and equity needed to turn pilot projects into commercial reality.

Recommendations

> Transparency leads to trust; trust is vital to build demand; and demand is a critical factor for bankability.

The discussions at the roundtable produced a rich body of practical insights from producers, buyers, traders, financiers and policy-makers – as well as a set of key findings from a follow-up Mentimeter survey. The following recommendations are drawn directly from ideas and commitments that emerged at the roundtable.

1. Use collaborative business models to spread the risk across the value chain

A transactional, business-as-usual approach to buying and selling will not be sufficient to accelerate production of low-carbon metals at the volumes required. The roundtable demonstrated consistent appetite for deeper commercial partnerships that distribute the risk of the transition more equitably.

- Buyers and end-users could consider co-investment in production infrastructure to distribute risk while securing future supply at competitive prices. Apple's investment in Elysis, a near-zero carbon aluminium smelting project, is one notable example.
- Buyers can maximize the impact of their long-term offtake by synchronizing agreements with suppliers' investment or debt repayment milestones. Some include clauses to hedge risks, for example: if clean energy prices go up, the buyer could pay more; if they go down, the raw material cost could be less.
- Transparent conversations between suppliers and buyers about the costs of decarbonization and the green premium are essential to build trust and help build a case for advance offtake.

2. Build the long-term strategic business case for low-carbon procurement

Until volumes of low-carbon metals reach a scale at which production costs achieve parity with conventional alternatives, the green premium will remain a commercial hurdle. Participants proposed several innovative approaches to reframe the green premium as an investment in risk management and strategic resilience:

- Build the business case for low-carbon procurement around total cost of ownership, including carbon risk, regulatory risk, supply risk, brand risk and future repricing – not just today's spot premium. Elevate decarbonization as a strategic procurement criterion alongside price, quality and delivery reliability.
- Communicate the value of low-carbon supply chains – in terms of strategic positioning, long-term competitiveness, energy security and risk-mitigation – to chief executives and their chief finance and procurement officers.
- Adopt voluntary internal carbon pricing to create the economic signal needed to drive

procurement decisions and prepare companies for future green premiums and/or mandatory carbon cost regimes being introduced across major markets. Set the price at a level consistent with future regulatory exposure – e.g. the ETS trajectory towards €130/t CO_2 by 2030.

3. Encourage governments to maintain their support

Roundtable participants were in broad agreement that private sector offtake and investment alone are not sufficient. Decisive government measures – such as fiscal support, backing breakthrough technology, streamlining permissions and investing in clean energy infrastructure – are critical to close the bankability gap. In a Mentimeter poll of roundtable participants, 90% of respondents – when asked which government action would most increase buyers' willingness to source low-emission metals – selected tax incentives as their top ask.

- Advocate to national governments for sustained public investment in breakthrough decarbonization technologies for steel and aluminium – based on the long-term, strategic interests of the economy. State support – in the form of tax incentives, grants, contracts for difference, concessional debt, loan guarantees and co-investment – is critical for capital-intensive, first-of-a-kind projects to achieve financial close.

- Urge governments to invest in the supply-side infrastructure for renewable energy and grid connections required to power low-carbon technologies more competitively than with fossil fuels.

- Some project backers cited permitting delays as their number one risk. They called for governments to fast-track permissions for projects that meet defined strategic decarbonization criteria and set a legally binding deadline for any permitting litigation to conclude.

- Call on governments to ensure clear carbon pricing and policy stability. Respondents to the Mentimeter poll said that lack of clarity and consistency in these areas was the number one barrier raised by financiers when assessing low-carbon metals projects.

- The First Movers Coalition also has a role to play: 89% of respondents to the Mentimeter poll selected focused government dialogue as the FMC's top priority.

4. Drive market transparency and shared standards

Without shared, global definitions for "green" and "low-carbon", along with a standardized methodology to measure and certify those emissions, buyers cannot compare suppliers' claims, prices cannot be trusted and the market cannot scale up. Equally, the roundtable highlighted the tension between setting an emissions threshold ambitious enough to drive genuine decarbonization and a benchmark accessible enough to be tradable at scale and drive market liquidity. Addressing these related challenges is a vital, systemic priority for the FMC community.

- Support efforts to agree shared definitions and a standardized carbon emissions measurement methodology.

- Formally engage with the ISO's ongoing process to ensure the resulting methodology reflects the practical realities of global steel and aluminium procurement.

- In parallel, work with market-making organizations to develop a tiered framework of thresholds for aluminium and steel that links green premiums to defined levels of emissions, in a way that maintains the integrity of FMC's strict decarbonization criteria while driving market liquidity at more accessible thresholds.

- Respondents to the Mentimeter poll said convening workshops with international standards setters is a top priority for FMC.

> **We need to be committed to zero carbon on both ends – as buyers and as suppliers. We as a group need to demonstrate we can do this.**
>
> Scandinavian aluminium producer and participant at FMC's low-carbon metals roundtable, March 2026

Appendix

TABLE 5 **FMC 2026 Metals Roundtable, Mentimeter survey – key findings**

A — Outlook and strategic positioning	
Q. Confidence in achieving low-emission metals commitments by 2030?	– **74% average confidence** score – **Cautiously optimistic:** respondents broadly believe FMC commitments achievable – **Lowest:** energy-sector buyers (40%) – **Highest**: aluminium producers (100%)
Q. Primary opportunity in sourcing low-emission aluminium/steel?	– Respondents frame low-emission metals as **strategic positioning**, not compliance – **#1 Long-term competitiveness** – **#2** Climate target alignment – **#3** Early access to limited supply – **Not yet material:** preferential financing / insurance or public procurement positioning
B — Constraints and cost pass-through	
Q. Primary constraint limiting ability to increase sourcing?	– **Joint #1: High price premium** + **Customer unwillingness to pay** – **Also prominent:** insufficient green premium transparency; lack of standardized definitions and certifications; limited supply – **Secondary:** regulatory and geopolitical uncertainty
Q. Ability to pass through additional costs to customers?	– **10-30% pass-through for majority** – No respondent passes on more than 60% of additional low-carbon costs – 70% of respondents answered “none” (0-10%) or “limited” (10-30%) – Respondents are absorbing most of the green premium internally
C — Customer value narratives and government action	
Q. Most effective way to demonstrate value to customers?	– **Joint #1: Brand positioning + Regulatory / carbon pricing de-risking** – **#3** Access to new tenders – **#4** Alignment to net-zero & disclosure requirements – **Lowest:** preferential financing / insurance; generic compliance
Q. Government action that would most increase willingness to source low-emission metals?	– **90%** selected **tax incentives** as top ask – **#2** Public procurement mandates – **#3** Stable carbon pricing – **#4** Harmonized definitions
D — Finance barriers and FMC priorities for 2026	
Q. Main barriers raised by financiers when assessing projects?	– Capital is available but it wants **demand certainty** – **#1 Unclear carbon pricing + policy stability** – **#2** Uncertain long-term offtake + demand signals – **#3** Insufficient project returns – **Lowest:** lack of standardized definitions; technology / FOAK risk
Q. Action FMC should prioritize in 2026?	– **89%** selected **focused government dialogue** as top FMC priority – **#2** Workshops with international standards setters (ISO, GHGP, SBTi) – **Specific asks**: methodological convergence with CBAM scope 2; broader FMC membership; distinguish “low-emission” from “net-zero” steel; geography-tailored conversations

Note: This survey was completed by FMC members who attended the roundtable. The findings should therefore be viewed as indicative rather than representative of all actors in low-carbon metals supply chains.

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