CLIMATE GROUP
STEELZERO

Policy principles to speed up the global transition to net zero steel

May 2022

Getting the steel industry to net zero

Steelmaking alone accounts for 7% of global annual carbon emissions

As urban areas and populations around the world continue to grow, so will the demand for steel. To have a fighting chance of limiting global temperature rise to 1.5C, the steel industry needs to make substantial emissions reductions within this decade. Only then will the world be on track to meet 2050 net zero targets.

The corporate demand signal for low emission and net zero steel is rapidly growing. Businesses recognise that the carbon emissions associated with the steel that they buy and use needs to be addressed to meet their own targets. But with a host of barriers facing the steel industry on the path to net zero, there isn't a silver bullet solution.

Climate Group shifts whole systems towards a cleaner future

We do this by forming powerful networks of business and governments, unlocking the power of collective action and influence. For example, our RE100 initiative is speeding up the global transition to zero carbon grids by bringing together businesses that commit to use 100% renewable electricity. Our 360 (and growing) members represent a business demand for clean power greater than the electricity demand of a G7 country. We've leveraged this corporate demand signal to drive supportive policy change in key markets. This has seen tangible success in the EU, India and Republic of Korea, opening up the renewable electricity market for business.

We're driving similar action with SteelZero

Our initiative, run in partnership with ResponsibleSteel, brings together leading organisations across the entire steel value chain to speed up the transition to a net zero steel industry. Businesses that join SteelZero make a commitment to use, buy, or specify net zero steel by 2050, with an interim commitment of using 50% responsibly produced steel by 2030. Collectively, SteelZero sends a strong demand signal for net zero steel, shifting global markets and policies towards responsible production and sourcing of steel.

More action and greater ambition is needed

Bold cross-sector collaboration and ambition from stakeholders across the steel value chain is critical to decarbonising the industry by 2050. Clear and supportive policies must be implemented by international, national and sub-national governments. We need action now from policymakers around the world to:

- Align the steel industry on what is defined as low emission, near-zero, and net zero steel
- Adopt appropriate frameworks and standards into public procurement of steel
- Drive the steel value chain to address embodied carbon
- Maximise the efficient use and recycling of steel
- Help steelmakers to transition to new and existing net zero technologies
- Create a level playing field for net zero steel in global markets

This paper sets out essential principles for what's needed to facilitate rapid and deep decarbonisation of the steel industry, alongside illustrations of action being taken now by governments and business.

These are core to unlocking the progress urgently needed across the steel sector and beyond.

Use global standards and definitions

Demand for low emissions materials is rapidly increasing. But without global alignment on what qualifies as low emission, there's confusion in the sector which holds back progress and hinders collective action on decarbonisation.

Businesses are calling for clear consistent use of common language and terms of reference, across the value chain and between jurisdictions, on what is defined as a low emission and net zero materials.

What's needed is **alignment on the definition of 'low(er) embodied carbon', 'near-zero'[1], 'net zero'[2], 'responsible', and 'green' steel**, amongst other emerging terms. To ensure credibility these need to be backed by clear climate-science, aligned with a just global transition, and independently verifiable international standards or certification.

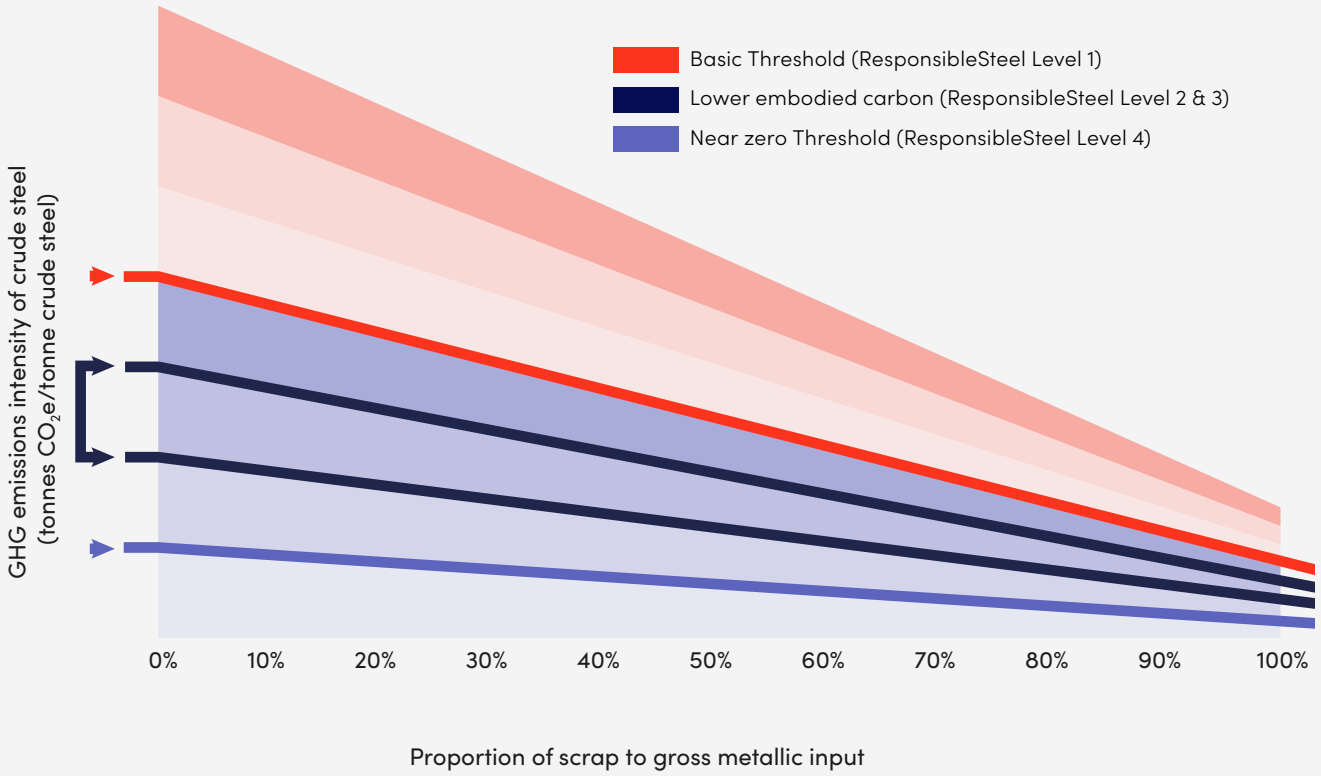
ResponsibleSteel is setting the appropriate framework for these definitions and global accountability. Details on this are illustrated in Figure 1.

Clear and agreed global definitions that are independently verified[3], need to be incorporated within:

- Public sector procurement criteria
- International trade agreements e.g. Global Arrangement on Steel and Aluminium (currently US and EU)
- Further relevant policy instruments e.g. Climate Clubs and Alliances, Carbon Border Adjustment Mechanisms (CBAM).

1 Near-zero is as close to the lowest practical emissions for known, innovative technologies. It acknowledges the presence of residual emissions that are (currently) technically impractical to eliminate completely on a gross basis.
2 Net zero is defined as near-zero emission steel, with only the remaining residual emissions removed or offset
3 For example by the ResponsibleSteel certification

Figure 1: Definitions for progressively decarbonised crude steel



ResponsibleSteel is setting a 'basic' carbon intensity threshold (depicted here by Level 1), to indicate current global average emissions intensity of crude steel production.

Lower embodied carbon steel will equate to production that falls below performance Levels 2 and 3.

The permitted emissions intensity for 'near-zero' steel is defined by performance Level 4.

This framing – taking into account the proportion of scrap used within crude steel production – falls in line with the framing of near zero emission definition(s) presented in the IEA's Achieving Net Zero Heavy Industry Sectors in G7 Members report,[4] ResponsibleSteel's methodology[5] and the steel definition used by the First Movers Coalition[6].

'Green' steel refers to steel that is certified as meeting the highest levels of environmental, social and governance performance (ESG), rather than only addressing the release of greenhouse gases. We're only aware of ResponsibleSteel taking the holistic approach to drive sustainable steel production for steelmakers, across their full scope 1, 2, and upstream scope 3 greenhouse gas (GHG) emissions as well as their wider ESG responsibilities.

4 www.iea.org/reports/achieving-net-zero-heavy-industry-sectors-in-g7-members
5 accelerator.chathamhouse.org/article/achieving-net-zero-steel
6 www.weforum.org/first-movers-coalition/sectors

Action in progress

SteelZero members

SteelZero members, such as WSP UK and Mace, have already embedded the SteelZero commitment criteria directly into their steel procurement and specification documentation. By doing so, they're informing their suppliers and value chain partners of the steel decarbonisation targets they've made, and are building out consistent use of definitions and standards across the industry.

Trimble

Trimble is incorporating the SteelZero commitment criteria into their BIM (building information modelling) technology to enable designers, detailers, and fabricators to determine whether the steel they plan to use is sourced from the most compliant suppliers[7].

7 www.trimble.com

Grow demand through government purchasing power

Harmony between public and private procurement is needed. This alignment will strengthen and streamline the message to steelmakers that decarbonisation of production processes is a global priority.

Public procurement can make up to 20% of local and national demand for steel[8]. One of the most powerful market creation tools for policymakers is to mandate the use of low emission, near zero, and ultimately net zero steel in all public projects and tenders.

We call on governments to set and implement specific **near-term 2030 and end-state 2050 targets.** These must be based on clear, consistent definitions – and align with action being taken in the private sector. This will immediately stimulate the market and focus industry attention on what needs to be delivered over the next 28 years.

Our SteelZero commitment framework[9] provides a clear strategy for all consumers to procure and specify responsibly produced steel. Through our framework, we've provided the foundations for policymakers to align with green public procurement strategies, ensuring at least 50% of steel procurement by 2030 meets appropriate criteria.

Coordinated support and mainstreaming of 'green' steel procurement from across all market segments has the power to transform the business case for steel producers. This will play a critical role in catalysing international decarbonisation of the steel sector, at the pace and scale that's needed.

8 www.energy-transitions.org/wp-content/uploads/2021/07/2021-ETC-Steel-demand-Report-Final.pdf
www.unido.org/sites/default/files/files/2021-10/Fostering_Industry_Transition_through_Green_Public_Procurement%20%281%29.pdf
9 www.theclimategroup.org/join-steelzero

Action in progress

The Industrial Deep Decarbonisation Initiative (IDDI)[10]

One of the key pillars of IDDI's work is to encourage ambitious national level green public procurement commitments to be made. As a coalition of organisations it works to drive demand for low carbon industrial materials and to align ambitious public and private sector procurement targets.

Buy Clean California Act[11]

The State of California regulates the levels of embodied carbon in its construction sector procurement through its Department of General Services. It requires state-funded projects to consider the environmental impact of the materials they use, including structural steel. When used in public projects these materials cannot exceed the acceptable limits.

10 www.unido.org/IDDI
11 www.dgs.ca.gov

Drive businesses to address embodied carbon

Embodied carbon emissions can represent a significant amount of the total emissions associated with the production of a material and its incorporation in building or infrastructure projects. Currently these aren't being addressed to the same degree as operational carbon emissions.

Policymakers must develop guidelines and regulations that address embodied carbon alongside the carbon emitted during the use phase of a building, vehicle, or vessel[12]. Powerfully, regulations would only need to address the embodied carbon of steel used in a few key sectors to fast track the creation of a low emission steel market[13]. This highlights the importance of the opportunity at hand.

Governments must widely promote **consistent methodologies for measuring and reporting on embodied carbon** across material supply chains and sectors. This work should build on existing approaches to address operational carbon emissions and formulate standardised lifecycle assessment of projects, products, and assets.

Already we've seen the impact of incorporating embodied carbon requirements into supply chain specifications. Businesses are sharing their knowledge and experience of lowering embodied carbon on past, present, and future projects. This is leading to progress that is substantially bolstering market awareness for low embodied carbon steel.

12 Whole life-cycle emissions (WLC) are the combination of embodied and operational carbon; the entire life cycle of emissions for a product, from production, use to disposal. Expanded in numerous industry reports – e.g. Chatham House Report: Making Concrete Change. Available at: www.chathamhouse.org/sites/default/files/publications/research/2018-06-13-making-concrete-change-cement-lehne-preston.pdf

13 The Net Zero Steel Initiative Sector Transition Strategy notes that regulations which address embodied carbon "on just a few steel-using value chains can be a key instrument to fast-track deployment of low-carbon steel Mission Possible Partnership, Net Zero Steel Sector Transition Strategy, October 2021. Available at: www.energy-transitions.org/publications/the-net-zero-steel-sector-transition-strategy/

Action in progress

Ørsted

Ørsted has assessed the environmental footprint across all the components in an offshore wind farm. The findings of this assessment show that on average steel accounts for over 50% of Ørsted's scope 3 GHG emissions of a typical offshore wind turbine, which will inform its decarbonisation strategy[14].

London Plan

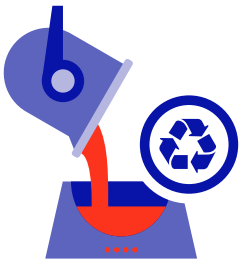
The 2021 London Plan[15] requires specific development proposals (that need approval from the Mayor) to calculate and reduce both operational and embodied carbon emissions. When implemented, this policy will assist in the gathering of data which can inform future embodied carbon targets for projects in London[16].

SKF

SKF has created a digital tool that quantifies the embodied carbon in its products by calculating the steel related upstream embodied carbon and combines with that from their own operations. This helps its customers design and specify lower embodied carbon products[17].

14 Ørsted Sustainability Report 2021. Available at: orsted-sustainability-report-2021.ashx (azureedge.net)
15 The London Plan is part of the statutory development plan for London, UK. This means that the policies in the Plan inform decisions on planning applications across the capital.
16 the_london_plan_2021.pdf
17 www.skf.com/binaries/pub12/Images/094881b4a395f885-19237-EN---SKF_2021_climate_goals_white_paper_tcm_12-593962.pdf#cid-593962

Underpin action with efficient design and circularity



Effective decarbonisation of the steel sector goes beyond transitioning production processes to lower carbon technologies. The sector must **maximise efficient use of steel** in the first place, as well as the **quantity and quality that's then injected back into the supply chain.**

We know that strategies to address both these priority areas are available today and have the capacity to vastly reduce carbon emissions associated with the sector. It's essential to streamline demand, whilst also driving recovery, recycling, and reuse of steel.

Demand side organisations, from architects to developers to fabricators, have a particularly influential role to play here at the beginning and end phase of all projects. Policymakers should consider the following when designing supportive policy:

- Encourage design that plans for disassembly and deconstruction
- Assess construction regulation and building codes to extend the lifetime of steel intensive assets
- Create dedicated investment and incentives to improve collection, sorting and separation techniques
- Ensure good quality and quantity of scrap for re-use and recycling, via appropriate carbon accounting systems
- Build capacity through training and the promotion of knowledge sharing within the industry
- Encourage material circularity within green public procurement strategies

Sectors and regions that struggle with aspects of material circularity, such as an established waste-handling procedure, should receive additional support and attention.

Action in progress

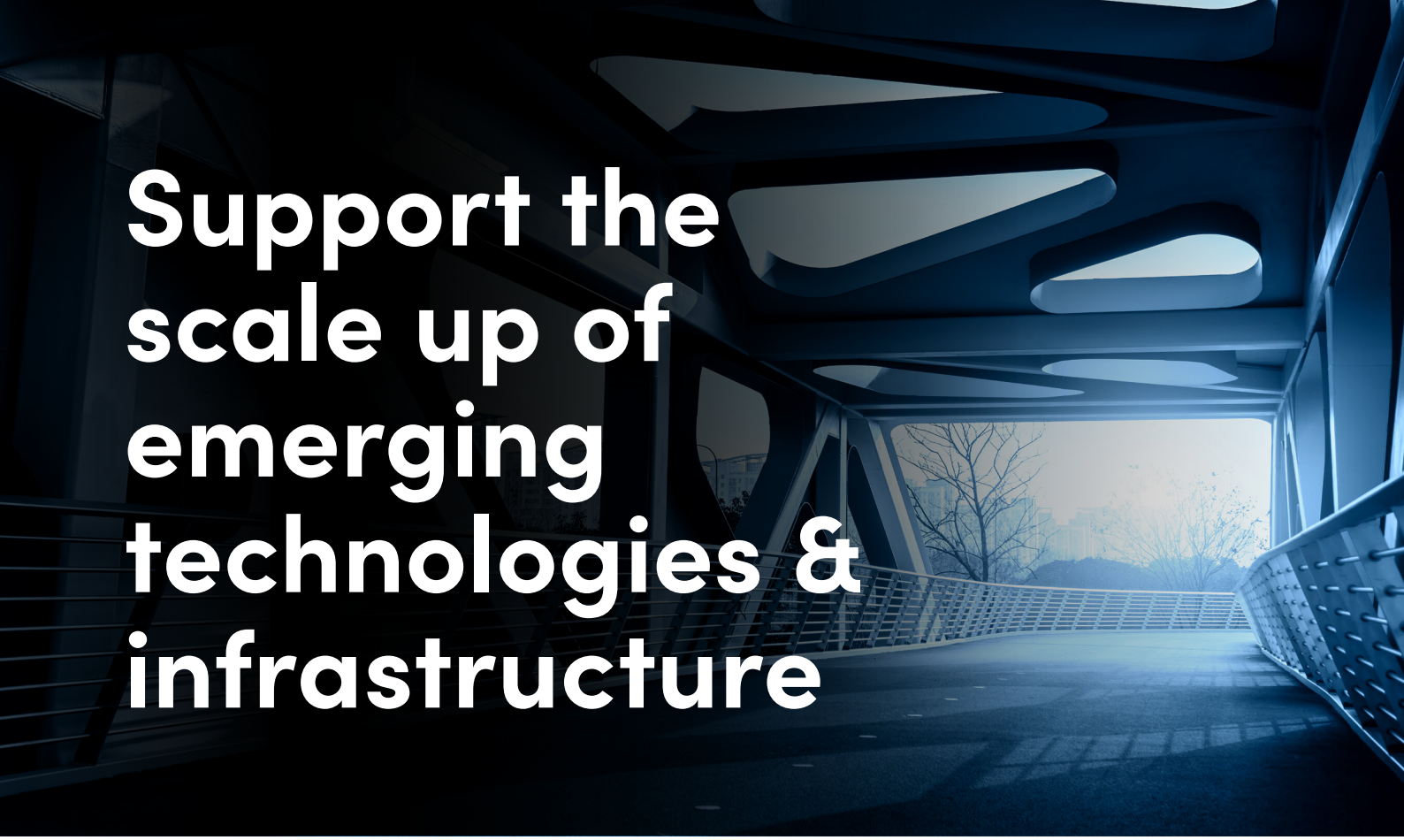
Multiplex

Multiplex use digital modelling software that enables designs to be rationalised and fully coordinated before construction starts. This supports the efficient use of materials from the outset. At completion, Multiplex passes these data rich models onto its clients, which can be used to inform strategies that allow the reuse of building materials[18].

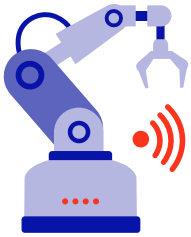
Sustainable Shipping Initiative

The global shipping fleet has continued to grow over the past two decades. Once decommissioned, these vessels will provide significant volumes of marine grade steel available for recycling. By 2028 14 million light displacement tonnes (LDT) of steel will be available, near quadrupling by 2033 to 28 million LDT[19]. There is a significant window of opportunity this decade, to create a hugely enhanced circular economy surrounding steel in the shipping and maritime sector.

18 indd.adobe.com/view/bc8d7b80-0fdb-4bab-89ef-194e5d148f0a
19 Sustainable Shipping Initiative: Exploring shipping's transition to a circular industry. Available at www.sustainableshipping.org/wp-content/uploads/2021/06/Ship-lifecycle-report-final.pdf



Support the scale up of emerging technologies & infrastructure



Within the next decade, steelmakers and steelmaking regions around the world face pivotal investment decisions. The results of these will have significant impact on the scale up of cleaner technologies, infrastructure, and the overall net zero transition of the industry. With a limited window of time, governments must act now.

Policies that set out detailed expectations and support mechanisms are needed to ensure steel plants drastically cut carbon emissions from the production process. To make this happen, policies need to drive the:

- Evaluation and implementation of the best available retrofit technologies and/or upgrade options for existing steel plants[20]
- Transition of blast furnaces to alternative steelmaking approaches such as DRI-EAF based production[21] when they face relining
- Restriction of new unabated blast furnaces without net zero retrofit-ready requirements being approved

20 Examples:
In January 2022, China introduced national government policy requiring 80% of steel capacity, by 2025, to complete ultra-low emission retrofit www.mee.gov.cn/xxgk2018/xxgk/xxgk03/201904/t20190429_701463.html
POSCO has been working to apply AI technology to its steel manufacturing processes since 2017, in particular its automotive steel sheet production Applying AI to the Manufacturing Industry – Official POSCO Newsroom

21 More information on the different steel making processes can be found in many industry reports, such as The International Energy Agency's Iron and Steel Technology Roadmap. Available here: www.iea.org/reports/iron-and-steel-technology-roadmap

Decarbonising steel production also hinges upon **transforming global energy infrastructure**. The build out of solutions including low emission hydrogen and carbon capture and storage (CCS) are key. Change must happen across the energy system from generation assets to storage facilities to transportation, transmission, and distribution networks.

Coordinated energy and industry policy will support and accelerate the critical transitions in both sectors of the economy. Only then will it be possible to secure the volumes of decarbonised steel required.

Action in progress

Iberdrola

Strong partnerships across the value chain are essential and demonstrate how cross-sector collaboration and business opportunities will deliver emerging technologies. Iberdrola has partnered with H2 Green Steel to build a green hydrogen production plant with 1 GW electrolysis capacity, which can fuel DRI production capable of producing approximately 2 million tonnes of steel annually[22].

North Rhine-Westphalia

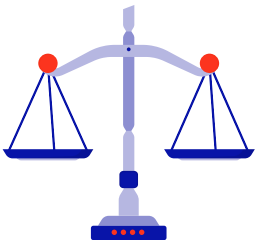
North Rhine-Westphalia region in Germany is responsible for around 40% of the country's steel production annually[23]. The steel industry is responsible for a significant proportion of the region's carbon emissions. To address this, North Rhine-Westphalia has set a 2025 target of establishing the first industrial scale DRI plant for the production of hydrogen based steel at its Duisburg site, which will drastically cut carbon emissions[24].

British Steel and SSAB

Steel suppliers, such as British Steel and SSAB, have made significant decisions to speed up their decarbonisation trajectories, specifically citing the growing demand for low emission steel as a critical reason[25]. Central to delivery is the investment in, and build out of, new technology and enabling infrastructure.

22 Iberdrola and H2 Green Steel sign 2.3 billion euros green hydrogen deal - Iberdrola
23 Read more at: www.wirtschaft.nrw/stahl-und-metalle
24 North Rhine-Westphalia Hydrogen Roadmap. Available at: www.wirtschaft.nrw/sites/default/files/asset/document/mwide_br_wasserstoff-roadmap-nrw_eng_web.pdf
25 Read more at: SteelZero cited as critical factor in UK steelmaker committing to deliver net zero steel by 2050 | Climate Group (theclimategroup.org);
CO2-free steel by 2030: Why Sweden's SSAB is pulling forward its green transition plan by 15 years | BusinessGreen News Analysis

Accelerate international coordination to ensure a level playing field



We're already starting to see steelmakers capturing domestic and international market share for low emission steel by decarbonising their production processes. It's essential that such progress is supported, while **ensuring that higher emission alternatives don't undercut markets**.

Policymakers have a critical role to play in creating this level playing field. Careful consideration must be given to the instruments and trade policy levers, including on carbon pricing, that can underpin such support. Where possible, the emphasis should be on **internationally consistent multilateral solutions** that create favourable conditions to produce low emission and net zero steel worldwide.

In this context, the importance of a globally applicable and implemented standard for net zero steel (see first section) is central to reinforcing consistent international, national, and sub-national policy.

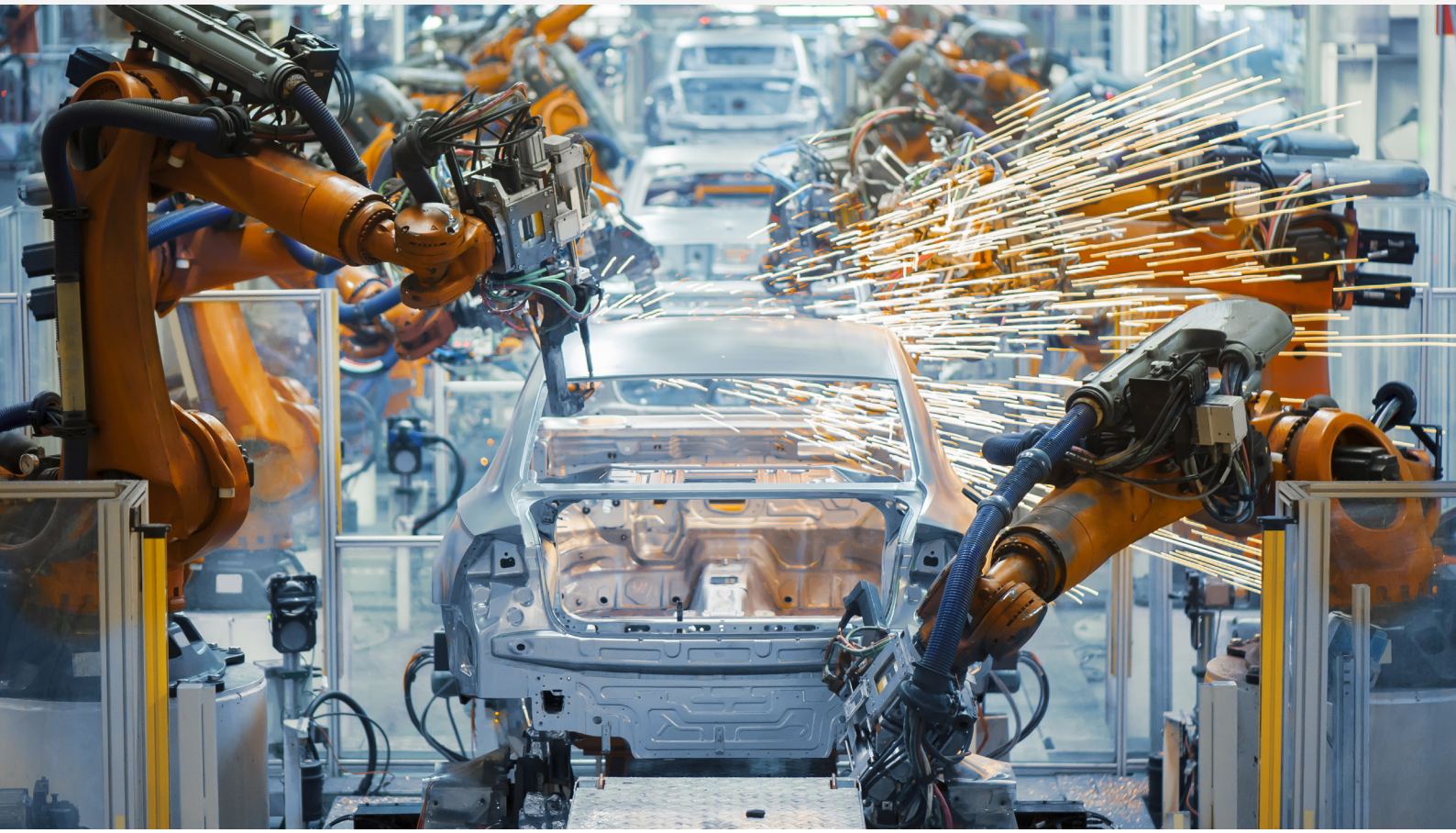
Action in progress

Using the ResponsibleSteel standard in international trade

World Trade Organisation (WTO) rules explicitly favour the use of international standards as references in trade agreements, and for public procurement. The ResponsibleSteel standard, developed in reference to the Code of Good Practice created by the International Social and Environmental Accreditation and Labelling Alliance (ISEAL), has been designed to ensure that it meets the requirements for recognition as an International Standard. It's therefore highly suitable for use in policy instruments which create a global level playing field, such as trade agreements, Climate Clubs/Alliances, Carbon Border Adjustment Mechanisms (CBAM).

Volvo Cars

Volvo Cars has implemented a strong internal carbon price[26]. This ensures that every future project undergoes a 'sustainability sense check' and a CO_2 cost is imposed for every anticipated tonne of carbon emissions throughout a car's life. This ensures the vehicles are profitable under a carbon pricing scheme, while also steering procurement and manufacturing decisions towards the most sustainable and future proof options.



26 Price set at 1000 Swedish Crowns, nearly double to EU's cost of carbon in the European Union's carbon trading scheme at time of announcement - www.reuters.com/business/cop/volvo-sets-carbon-price-assess-sustainability-new-projects-2021-11-10/

Stepping up action

The business voice is strong on what needs to be addressed to decarbonise the steel industry. These essential principles reflect this. They set out a clear pathway for international, national, and sub-national governments to transform the global steel industry.

What's more, our principles can be used as a tool to advocate for action across supply chains, partnerships, and networks. If widely implemented, these principles can mobilise the systemic change that's needed to decarbonise the steel sector and beyond.

Now is the time for action. And these are the rungs on the ladder to reach net zero steel.

CLIMATE GROUP

About Climate Group

The Climate Group drives climate action. Fast. Our goal is a world of net zero carbon emissions by 2050, with greater prosperity for all. We focus on systems with the highest emissions and where our networks have the greatest opportunity to drive change. We do this by building large and influential networks and holding organisations accountable, turning their commitments into action. We share what we achieve together to show more organisations what they could do. We are an international non-profit organisation, founded in 2004, with offices in London, New Delhi and New York. We are proud to be part of the We Mean Business coalition.

Responsible™ Steel | standards & certification

About ResponsibleSteel

ResponsibleSteel's mission is to maximise steel's contribution to a sustainable society. A not for profit organisation, ResponsibleSteel is the industry's first global multi-stakeholder standard and certification initiative. With members from every stage of the steel supply chain, ResponsibleSteel is developing an independent certification standard to ensure businesses and consumers can be confident that the steel they use has been sourced and produced responsibly at every stage.

CLIMATE GROUP
STEELZERO

About SteelZero

SteelZero is a global initiative bringing together forward-looking organisations to speed up the transition to a net zero steel industry. Led by international non-profit the Climate Group in partnership with ResponsibleSteel, organisations that join SteelZero make a public commitment to procure 100% net zero steel by 2050. By harnessing their collective purchasing power and influence, SteelZero sends a strong demand signal to shift global markets and policies towards responsible production and sourcing of steel. **#SteelZero**

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The Climate Group, Inc. a 501(c)3 with EIN 43-2073566.
M/s TCCO India Projects Private Limited with Corporate Identity Number U74999DL2018PTC334187