

# STEEL CONSTRUCTION

## Sustainable Procurement





Steel for Life and the British Constructional Steelwork Association (BCSA) are working closely together to promote the effective use of structural steelwork. This collaborative effort ensures that advances in the knowledge of the constructional use of steel are shared with construction professionals.

Steel is, by a considerable margin, the most popular framing material for multi-storey buildings in the UK and has a long track record of delivering high quality and cost-effective structures with proven sustainability benefits. Steel can be naturally recycled and reused continuously, and offers a wide range of additional advantages such as health and safety benefits, speed of construction, quality, efficiency, innovation, offsite manufacture and service and support.



The steel sector is renowned for keeping specifiers abreast of the latest advances in areas such as fire protection of structural steelwork, UKCA Marking and achieving buildings with the highest sustainability ratings. The 'Steel Construction' series of publications has provided detailed guidance on a range of key topics and market sectors. Guidance is provided on all relevant technical developments as quickly as is possible.

The sector's go to resource website – [www.steelconstruction.info](http://www.steelconstruction.info) – is a free online encyclopedia for UK construction that shares a wealth of up-to-date, reliable information with the construction industry in one easily accessible place.

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## Introduction

by David Moore, Chief Executive Officer,  
British Constructional Steelwork Association

# Steel will shine in the sustainable procurement process



**P**lans to tackle the carbon-related climate emergency are in hand across industries and countries globally, and as a result we can expect to see substantial changes to the current carbon emissions-heavy practices of today. Sustainability will in future be a key objective in any credible procurement strategy, and failure to take that on board will surely not be tolerated by regulators or society as a whole.

The steel construction sector has been focused on sustainability for many years, educating the market in the many sustainability benefits of steel, and has made a positive start to its own zero carbon journey. The benefits of steel go well beyond just carbon, encompassing the three pillars of sustainability, namely economic, social and environmental aspects. However, this publication is unashamedly focused on the latter, which is at the forefront of everyone’s minds as the effects of climate change increasingly are evident.

The aim of this publication is to highlight the numerous and varied initiatives underway in the steel construction sector that support sustainable procurement. In summary, it describes what

BCSA is doing to assist and encourage its members and the entire supply chain on their journey to net zero for their construction projects.

The initiatives you’ll read about include the 2050 Roadmap that clearly signposts the road to net zero carbon for steel construction, the new Annex J Sustainability Specification to complement the National Structural Steelwork Specification for Building Construction (NSSS) and BCSA’s updated Sustainability Charter with an enhanced focus on carbon reduction, as well as our involvement in industry initiatives such as BES 6001, SteelZero from ResponsibleSteel, CO<sub>2</sub>nstructZero and what our members are doing to minimise their own carbon footprints

But, cutting to the chase, the publication concludes with a set of nine key recommendations for specifying and procuring sustainable structural steelwork. Read on to find out more.

There will be more sustainability-related initiatives announced by the BCSA and other steel sector partners as our net zero carbon journey picks up pace. In the meantime, we hope you find this document interesting and informative as well as useful.

*February 2023*

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# Steel answers the carbon questions for sustainable procurement

**Sustainable procurement is destined to become an increasingly important part of the drive towards net zero carbon and realising other sustainability ambitions of governments and society.**

**T**he signs are already clear. Sustainability tests feature in most, procurement processes. Clients are demanding that tenderers show they are taking all practicable steps to fulfil sustainable procurement requirements.

The properly designed and implemented sustainable procurement strategies of the future will force entire supply chains and users of buildings and other infrastructure to focus on reducing embodied carbon and carbon emissions in construction and in use.

The steel construction supply chain has good reasons to feel confident about its future in a world where sustainability considerations are given their proper place in procurement decision making.

The BCSA and other supply chain partners have gone to considerable lengths over the years to spell out the many sustainability advantages of steel in a range of studies and publications, making sure that construction professionals have everything at their fingertips needed to take full advantage of

steel's sustainability benefits in design and construction.

Other sustainability related initiatives are ongoing, and will be followed by many more to continuously improve the steel sector's environmental performance. For example, new design guidance is currently being prepared that will help designers pursue strategies for reducing emissions from buildings to meet targets being promoted by organisations such as the London Energy Transformation Initiative (LETI) and the Royal Institute of British Architects (RIBA).

## **An inherently modern method of construction**

This document describes how steel construction, as an inherently modern method of construction, will play a prominent role in procurement strategies that will carry us to a sustainable future.

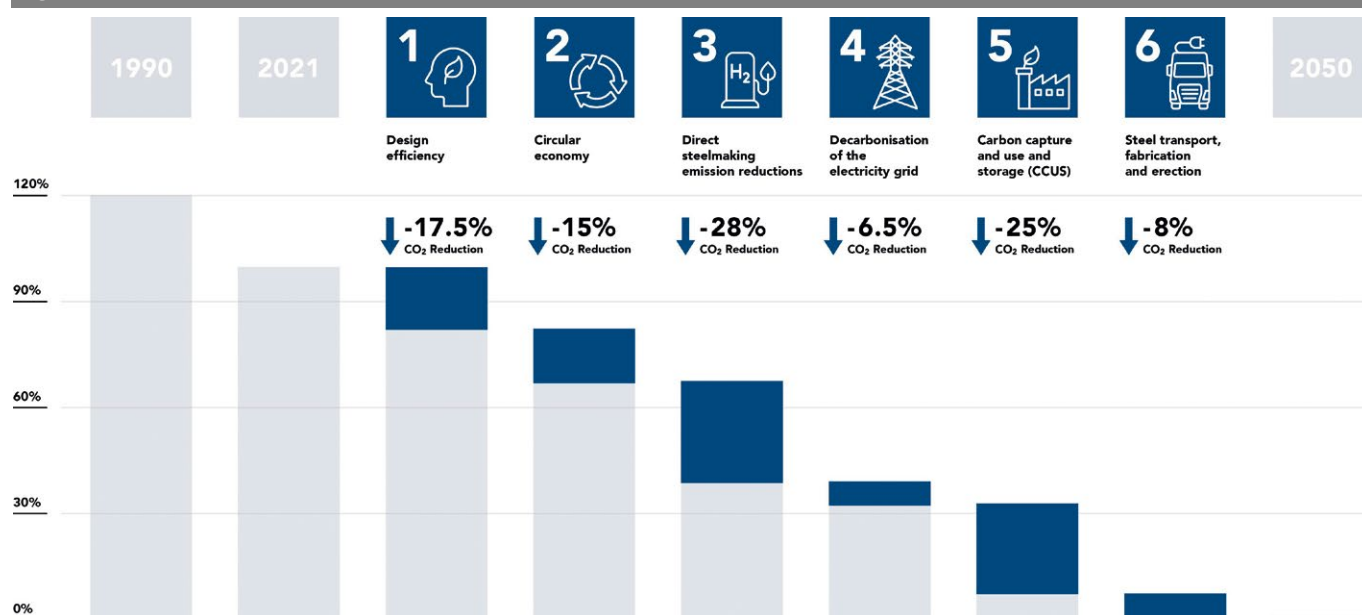
As the market leading solution for a wide range of buildings and structures – 65% for multi-storey buildings and 98% for industrial sheds – the constructional steelwork sector recognises that it can make a significant contribution to more sustainable structures.

How the steel sector will address supporting the government's net zero carbon ambitions was well documented and publicised in the BCSA's 2050 Roadmap document in 2021. It reassures clients, designers and contractors that there is an overall steel sector plan to decarbonise that is realistic and achievable. The 2050 Roadmap describes in some detail how that will be done, using known technologies that are now available or are well along the road to commercial viability.

Sustainable procurement will mean that sustainability considerations are given due weight alongside cost, quality and service when decisions are being made – but steel construction has always scored outstandingly well when these traditional criteria are considered. Steel has for many years been



Figure 1: The 2050 Roadmap's route to net zero



recognised as the most cost-effective material of choice for key parts of the construction market. A strengthening focus on the circular economy, on the life cycle costs and benefits of construction materials, will increasingly show steel in a beneficial light.

A new Sustainability Specification for structural steelwork published by BCSA in 2022 provides general requirements and practices for achieving environmentally sustainable steel building construction. The Sustainability Specification will constitute a new Annex J to the National Structural Steelwork Specification for Building Construction (NSSS) when it is revised for its 8th edition. Annex J supplements the requirements of Clauses 1 to 11 of the NSSS and includes guidance on both the sustainable design and sustainable fabrication of structural steelwork.

A focus on sustainable procurement will involve consideration of many factors including measures of environmental performance, and steel construction has always scored highly on circular economy principles. Steel construction also provides wider Environmental, Social and Corporate Governance (ESG) benefits.

For example, offsite manufacture means on-site working is minimised, with workforces operating safely in factory conditions, returning home at regular hours each workday, as opposed to the large on site workforces needed for other

construction materials who often can only return home at weekends. Steel is typically brought to site as and when needed for fast and safe assembly, minimising impacts on local communities.

### Steel's flexibility extends buildings' lives

Cost will always be a significant driver of decisions, but as well as cost, proper analysis of sustainability principles would also involve consideration of a wide range of issues, under the three sustainability principles of economics, social benefit and environmental responsibility. Steel scores highly on all of them.

Sustainable Procurement demands consideration not only of how a building or other structure is built, but of how it performs in use and how it is treated after its original utility has ended.

Modern mechanical and electrical equipment for services like ventilation and heating can be more easily accommodated in a steel-framed building by being incorporated in the structure itself through the use of cellular beams. Retrofitting is also easier for the same reason.

In a world where the uses for buildings could change often during their design lives the ability of steel-framed buildings to be more easily reconfigured for changed uses needs to be fully appreciated.

Steel provides building owners and procurement professionals with a more sustainable range of options than demolition. Because of its relatively low self-weight, steel-framed vertical extensions to many buildings are often possible without additional foundation works.

Sustainable procurement will also recognise that the potential for reuse and recycling of steel after buildings and other structures reach the end of their useful lives is another major sustainability advantage, saving significant amounts of embodied carbon rather than being down cycled as with other materials. No steel will be discarded after its original use, as it can be reused or recycled as a key material in the production of new steel.

Demountability is another key factor to consider when procuring buildings, allowing structures to be removed for reassembly elsewhere, as with some structures used at the 2012 London Olympics and the 2022 FIFA World Cup.

### Sustainability Charter focuses on delivering promises

Procurement professionals will increasingly focus on what their suppliers actually do, rather than just on what they say, in relation to environmentally responsible practices, and will need to be convinced that they have proper

Figure 2: Decarbonisation 'levers' in the 2050 Roadmap

Decarbonisation Lever	Design efficiency	Circular economy	Direct steelmaking emission reductions	Grid decarbonisation	Carbon capture and use and storage	Steel transport, fabrication and erection
CO <sub>2</sub> reduction	-17.5%	-15%	-28%	-6.5%	-25%	-8%
	<p>Demand reduction through greater design efficiency and less conservative design.</p> <p>Measures include:</p> <ul style="list-style-type: none"> <li>• Reducing over-specification</li> <li>• Section and profile optimisation</li> <li>• Use of higher strength steel</li> <li>• Extending building lifetimes by designing for adaptability</li> </ul>	<p>Demand reduction measures relating to extending building lifetimes and preserving the value of steel products through reuse and recycling.</p> <ul style="list-style-type: none"> <li>• Steel structures are inherently flexible and adaptable</li> <li>• Closed-loop recycling is current practice with 99% of UK structural sections recovered for recycling.</li> <li>• Structural steel is inherently reusable</li> </ul>	<p>Range of technologies including step-change technologies like hydrogen and incremental process improvements.</p> <p>Technologies include:</p> <ul style="list-style-type: none"> <li>• Waste heat recovery</li> <li>• Coke dry quenching</li> <li>• Injection of natural gas</li> <li>• Increased scrap use</li> <li>• Use of biomass</li> <li>• Hydrogen injection and DRI</li> </ul>	<p>UK electricity grid decarbonised in line with national targets.</p> <p>Steelmaking reductions will also depend on the national shift from BF-BOF to scrap-based EAF production.</p>	<p>Suite of technologies that involve the capture of CO<sub>2</sub> and either its use or permanent storage.</p> <p>British Steel and Tata Steel are members of industrial clusters developing CCUS technologies.</p>	<p>Main impacts are from energy used in the fabrication shop and offices, together with transport of finished products to site, business travel and on-site erection activity.</p> <p>Reduction measures:</p> <ul style="list-style-type: none"> <li>• Energy efficiency and renewable energy technologies</li> <li>• Energy efficient fabrication equipment</li> <li>• Electric vehicles and electric plant</li> </ul>

processes in place to deliver on sustainability promises.

One reliable source of reassurance comes from the BCSA Sustainability Charter that commits members to a range of environmentally sound behaviours. An audit process checks that steelwork contractors are doing what they say they will do.

Charter Members formally declare that they will operate in sustainable ways that promote:

- Adding value to clients and stakeholders.
- Optimising the eco-efficiency of the steel construction life cycle.
- Resource and energy efficiency in steel construction through reuse and recycling.
- Operating in a safe, healthy and environmentally sound manner.
- Promoting respect for people and communities associated with steel construction.
- Upholding high ethical standards.

The Charter has been used to help improve understanding of sustainability among steel construction companies and to help them manage their businesses in more sustainable ways.

## Roadmap shows steel's sustainable way forward

The UK steel sector detailed its commitment to a sustainable future in the 2050 Roadmap in 2021, which shows how it intends to achieve net zero carbon by 2050, in support of the Climate Change Act, with substantial progress to be made by several target dates along the way.



The Roadmap shows how significant investments are already being made in new technologies that will reduce carbon emissions all along the steel supply chain. The aim is to produce a genuine circular and sustainable net zero carbon structural steel sector by the government's target date of 2050.

Underpinning the strategy are new technologies that are either proven or at the pilot stage, that have been identified and are being adopted by steel producers.

The Roadmap strategy uses six 'levers' to show exactly where carbon savings can be made with significant contributions coming from improvements in design efficiency, as well as an even greater emphasis on recycling and reuse, on reducing emissions in direct steelmaking, decarbonisation of the national electricity grid, carbon capture and use and storage, and further improvements in how constructional steelwork is fabricated, transported to site and erected.





Early engagement with the steelwork contractor enables efficient planning and coordination of site operations

# Sustainable procurement begins with proper specification

The UK's drive to net zero carbon by 2050 is forcing the entire construction sector to examine its procurement practices to a more intense degree than ever before.

Societal pressures as well as legislation are fundamentally altering what good, sustainable, procurement practice means.

Many changes in the way the industry operates will be needed to achieve decarbonisation objectives; for example, making simple assumptions about what efficient design of a structure means, or taking for granted the provenance of materials specified, is no longer regarded as a sustainable procurement approach.

Sustainable procurement of structural steelwork starts with the specification. There has always been detailed advice available from the steel construction sector about what best practice specification should be, to be found in regularly updated guidance from the BCSA, particularly the National Structural Steelwork Specification (NSSS), currently in its 7th edition.

Specifiers are encouraged to adopt the NSSS as the default specification for all steel building structures. It delivers many benefits to users and is a key support for the process of translating a designer's requirements into specific work instructions for execution.

The scope covers the requirements in

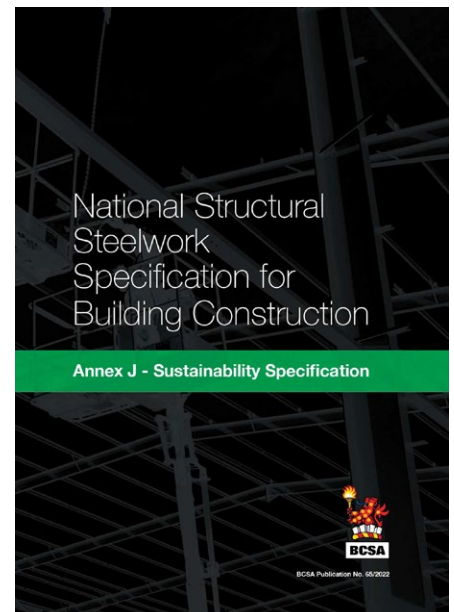
BS EN 1090-2 for orthodox building structures, but provision is included for modifications to suit any 'unorthodox' construction.

The NSSS has been supplemented since June 2022 by the 1st edition of the Sustainability Specification for structural steelwork, that highlights the key issues for achieving environmentally sustainable steel building construction. Freely available on [www.steelconstruction.info](http://www.steelconstruction.info), this document will constitute a new Annex J to the NSSS when revised in its 8th edition.

Annex J supplements the requirements of Clauses 1 to 11 of the NSSS and includes guidance on a range of topics including:

- Principles of sustainable steelwork for building construction.
- Requirements for supply chain members.
- Guidance for sustainable design of structural steelwork.
- Specification for sustainable fabrication of structural steelwork.

The annex also covers topics including steel procurement, project specification requirements in terms of sustainability, and reusing structural steel.



Prepared under the guidance of a steering committee comprised of structural steel suppliers, steelwork contractors, designers, and individual sustainability experts from the BCSA, Steel Construction Institute, and IStructE, this Sustainability Specification can be incorporated in the contract documentation separately to the NSSS by specifying the following: *Fabrication in accordance with (i) National Structural Steelwork Specification for Building Construction (NSSS), 7th edition and (ii) NSSS - Annex J - Sustainability Specification.*





The design programme should allow for iterations to reflect the availability of reclaimed materials

### Principles of sustainable steelwork for building construction

The aim of structural design is to provide a structure capable of fulfilling its intended function and sustaining the specified loads for its intended life, with due regard to sustainability, robustness, economy, and health and safety.

Environmental considerations for sustainable construction should take into account structural adequacy of the design of the structure in the completed project; safety during fabrication, transportation, handling, and erection; and temporary stability of the structural steel frame.

All parties in the supply chain for structural steelwork should take practical steps to reduce the greenhouse gas emissions of the processes over which they have control, to contribute to meeting UK commitments to reach net zero carbon by 2050.

Structural steelwork should be designed, procured, detailed and fabricated to minimise material use and to reduce waste, to the extent that is reasonably practicable.

Steelmaking makes full use of available scrap material, and decisions regarding the choice of

steel production process to be used should take into consideration that, on a global basis, this scrap material is a highly constrained resource.

Structural steelwork should be designed and detailed to facilitate its recovery for reuse at its end-of-life stage as part of the circular economy, where this is reasonably practicable.

### Requirements for supply chain members

Where possible, implementation of the following practices to minimise the environmental impacts of steelwork construction should be considered.

Project specification may include requirements for the employer to appoint key contractors – for example steelwork, cladding, mechanical and electrical and glazing contractors – as early as possible to ensure packages are fully co-ordinated and to avoid unnecessary reworking.

Early engagement with the steelwork contractor to increase lead-in periods is highly desirable. This enables more efficient planning and co-ordination of site operations and material supply as well as collaboration with the design team.

Similarly, early engagement with the coating system manufacturer and supplier should be a priority to ensure that the coating system used is adequate and its durability is maximised, along with appropriate maintenance to minimise whole-life environmental impacts.

For hot-dip galvanizing, early consultation with the galvanizer is recommended to ensure suitability of the design for galvanizing, such that all work is efficiently processed.

It is important to maximise structural zones to facilitate lean, efficient designs, and if reclaimed materials are to be considered or specified, then flexibility in the design should be provided to allow for design iterations to reflect the availability of reclaimed materials.

### Guidance for sustainable design of structural steelwork

Design for material efficiency is key, with due regard to the practicality and cost of fabrication and for longevity so that the upfront embodied carbon associated with the structure leads to extended building lifetimes and yields reusable structural elements.

Using materials efficiently and minimising quantities can be done in a number of ways,



such as: avoiding over-specification of design loads; optimising spans and grids; minimising complex load paths; making sure structural deflection and vibration criteria are appropriate and avoid excessive material use; and specifying higher strength steel grades in members not governed by serviceability criteria.

Design should also facilitate building flexibility and adaptability and ensure that where complex connections are being considered to reduce material usage, the full fabrication and installation implications have been considered, and any additional waste is considered in material usage and environmental impact assessments.

Similarly, design should consider any temporary works requirements. The use of temporary works, particularly bespoke items that are unlikely to be reused, will increase carbon emissions and should also be considered in environmental impact assessments.

The over-rationalisation of steel member sizes should be avoided to ensure efficient use of material, with due consideration of minimum economic quantities for procurement, and section sizes should be reviewed to minimise weight while complying with safe methods of erection and fire protection requirements.



### Specification for sustainable fabrication of structural steelwork

All structural steel should be procured based on the principles of responsible sourcing as defined in BES 6001, with the supplier required to have an environmental management system that follows the principles of BS EN ISO 14001.

Structural steel should be sourced from steel producers that have defined and are implementing a strategy to reduce

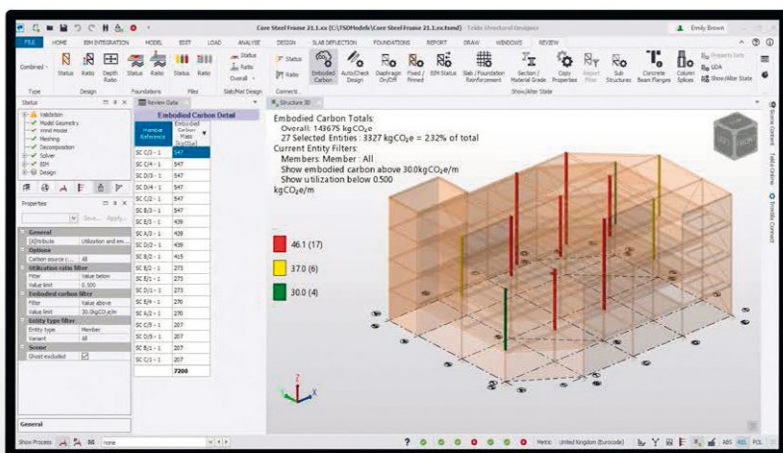
greenhouse gas emissions and have made a public commitment to decarbonise in line with national and/or international carbon reduction targets.

The steelwork contractor should consider ordering directly from mills to minimise offcuts. Alternatively, if stock lengths are ordered, these should be used efficiently in order to minimise waste. Splice locations in steel members should be co-ordinated to fall within standard stock length sizes. All steel fabrication waste should be either reused or recycled.

The steelwork contractor should consider if offcuts of material can be used elsewhere, such as temporary works, connection fittings, shims and packs, rather than simply scrapping for recycling. Reuse should always be prioritised over recycling.

The records of the as-erected structure should contain all relevant information to allow the origin and properties of the completed components to be identified to facilitate their reuse in the future.

Steelwork contractors can demonstrate their operations address sustainability issues relevant to structural steelwork with membership of the BCSA Steel Construction Sustainability Charter.



Design for material efficiency is key



Steel recycling is efficient and well established

# Industry wide initiatives support collaborative carbon reducing action

The steel construction sector recognises that collaboration all along the supply chain will be needed if carbon reduction targets are to be achieved, so has joined several industry wide and global initiatives that support sustainable procurement.

**P**rocurement professionals should recognise that steel construction has been a leader in achieving industry wide support for carbon reduction and other sustainability related initiatives. Steelwork contractors have always recognised that their own long-term sustainability efforts would be strongly amplified by collaboration with partners, so the BCSA has played an active role in developing a wide range of industry initiatives.

Successful participation in initiatives that show the sector's long-standing commitment to minimising environmental impacts include BES 6001, SteelZero from ResponsibleSteel and most recently CO<sub>2</sub>nstructZero.

## BES 6001

BES 6001 is a framework standard, developed by BRE Global, for responsible sourcing within the construction industry. The standard is used alongside an independent, third-party certification scheme that allows manufacturers to have their products certified as being responsibly sourced via an independent assessment process.

The framework lays down requirements to be followed for an organisation to manage the supply of construction products in accordance with a set of agreed principles relating to:

- Organisational management requirements
- Supply chain management
- Management of sustainable development.

Certification to BES 6001 has been obtained by most of the major steel producers supplying the UK construction market including:

- ArcelorMittal Europe
- British Steel
- Dillinger
- Liberty Steel
- Spartan UK
- Tata Steel

Although several larger UK steelwork contractors have BES 6001 certification, within BREEAM the 'broken chain' approach allows for companies that only fabricate steel products to obtain responsible sourcing (Mat 03) credits on projects as long as they use steel produced by a company certified to BES 6001.



**ResponsibleSteel**

ResponsibleSteel is the steel industry’s first global, multi-stakeholder standard and certification initiative. It was established in 2016 with the aim of enhancing the responsible sourcing, production, use and recycling of steel. The Standard applies to operational steel sites and to related sites that process raw materials for steelmaking, or that produce steel products.

The Standard (Version 2.0) is structured on 13 ESG Principles (see figure, right) with 370 associated requirements.

There are currently 11 approved, ResponsibleSteel certification bodies globally. As at October 2022, 13 steel production sites, mostly in Europe, have been ResponsibleSteel certified.

**SteelZero**

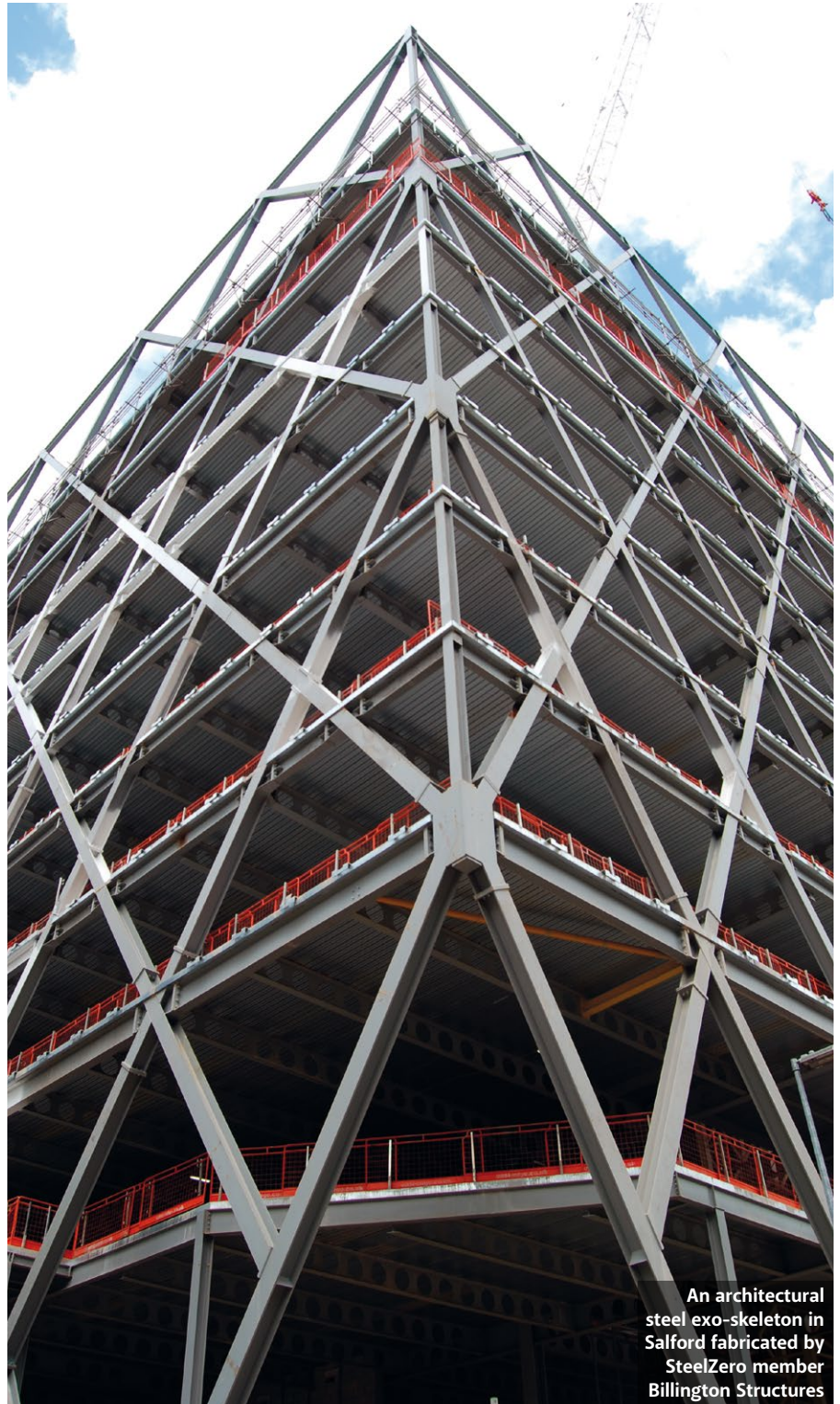
SteelZero is a global initiative, developed by the Climate Group in partnership with ResponsibleSteel, for companies that use, specify and procure steel products. Companies that join SteelZero are using their purchasing power and influence to send a powerful demand signal to steel producers, investors and policymakers to speed up widescale production of low and net zero carbon steel.

Organisations who join SteelZero, are required to make a public commitment to transition to 100% Net Zero Steel by 2050 and, as a minimum, make an interim commitment to procure/specify/stock a total of 50% of their steel requirement by 2030, meeting one or a combination of the following conditions:

1. ResponsibleSteel Certified Steel, or steel meeting an equivalent international standard.
2. Steel produced by a steelmaking site where the site’s corporate owner has defined and made public both a long-term emissions reduction pathway and a medium-term, quantitative science-based GHG (Greenhouse Gas) emissions target for the corporation. A science-based target approved by the SBTi (Science Based Targets initiative) or other quantitative, scientifically

Figure 3: ResponsibleSteel’s 13 ESG Principles

Governance principle	Social principles	Environmental principles
1. Corporate leadership 2. Social, environmental and governance management systems	3. Responsible sourcing of input materials 4. Decommissioning and closure 5. Occupational health and safety 6. Labour rights 7. Human rights	8. Stakeholder engagement and communication 9. Local communities 10. Climate change and greenhouse gas emissions 11. Noise, emissions, effluents and waste 12. Water stewardship 13. Biodiversity



justified target of comparable ambition, quality and coverage would meet this interim requirement in full.

3. Low Embodied Carbon Steel, as defined by SteelZero.

There are currently 27 SteelZero members including several UK main contractors and steelwork contractors. Although most SteelZero members are currently European, SteelZero is being expanded to other markets including India, South Korea, Japan and China.

### CO<sub>2</sub>nstructZero

The BCSA is now a partner of CO<sub>2</sub>nstructZero, joining over 100 other construction organisations.

“CO<sub>2</sub>nstructZero is a new, industry-wide initiative led by the Construction Leadership Council (CLC). Its role is not to develop new solutions, but to bring people and organisations together to consolidate collective actions and plans for the sector,” said BCSA Sustainability Manager Michael Sansom.

CO<sub>2</sub>nstructZero is the construction sector’s response to the Government’s commitment to be net zero by 2050 and sets out how the industry can collectively meet this target. Using the Climate Change Committee’s 6th Carbon budget, CO<sub>2</sub>nstructZero defines nine priorities that form an action plan and sets out how progress will be measured.

The nine priorities are:

1. Accelerating the shift of the construction workforce to zero emission vehicles and onsite plant.
2. Optimise the use of modern methods of construction and improved onsite logistics.
3. Championing developments that enable connectivity with low carbon modes of transport.
4. Retrofit buildings to improve the energy efficiency of the existing housing stock.
5. Scale up industry capability to deliver low carbon heat solutions in buildings.
6. Enhance the energy performance of new and existing buildings.
7. Implement carbon measurement to support



William Hare has been selected as a CO<sub>2</sub>nstructZero Business champion and is said to be the first steelwork contractor to join over 100 other companies taking action on the climate emergency. As Business champions, William Hare joins the platform to share best practice and innovation opportunities in order to create a more sustainable future.

William Hare Environment & Sustainability Manager Katie Atherton said: “Our people are constantly looking for innovative ways to reduce carbon and believe collaboration

is key. We are looking forward to exploring relationships and seeking out opportunities with other Business champions.

“This commitment, along with our Science Based Target (SBTi) makes us accountable for our statements and supports our roadmap, which will be published by the end of this year. Our work towards the SBTi has allowed us to examine our business and operations in more detail, giving rise to exciting new initiatives to further reduce our carbon past the 49.67% reduction already made against the 2010 benchmark.”

our construction projects in making quantifiable decisions to remove carbon.

8. Become world leaders in designing out carbon, developing the capability of designers and construction professionals.
9. Support development of innovative low carbon materials as well as advancing low carbon solutions for manufacturing production processes and distribution.

To measure progress, CO<sub>2</sub>nstructZero has published a Performance Framework which sets out the nine headline commitments and the metrics for measurement progress.

BCSA is also encouraging its members to become Business champions.

Business champions need to provide tangible evidence of the steps that they are taking to respond to the net zero climate challenge in relation to the nine CO<sub>2</sub>nstructZero priorities most relevant to their business. They are also required to nominate an Emerging Leader (a young ambassador aged 20-35) drawn from either their organisation or existing Business Network who will provide a critical voice of challenge to their host organisation on the level of ambition being set.





Steelwork contractors that have signed up to the Charter are serious about tackling climate change

# Steelwork contractor's Sustainability Charter took a global lead

Procurement professionals all along supply chains need to ensure that construction products come from suppliers that can demonstrate their sustainability credentials at every stage, making a vital contribution to decarbonisation.

**S**ustainable procurement will increasingly lead towards ever closer scrutiny of the provenance of all construction products including steel, which is welcomed by major manufacturers including British Steel, Tata Steel and ArcelorMittal.

Steelwork contractors will likewise be scrutinised intensely for their sustainability commitment and achievements, something that the UK steel construction sector has for long been prepared. The BCSA took an international lead in 2005 with the introduction of its Sustainability Charter, making it the first steelwork contractor representative body in the world to make

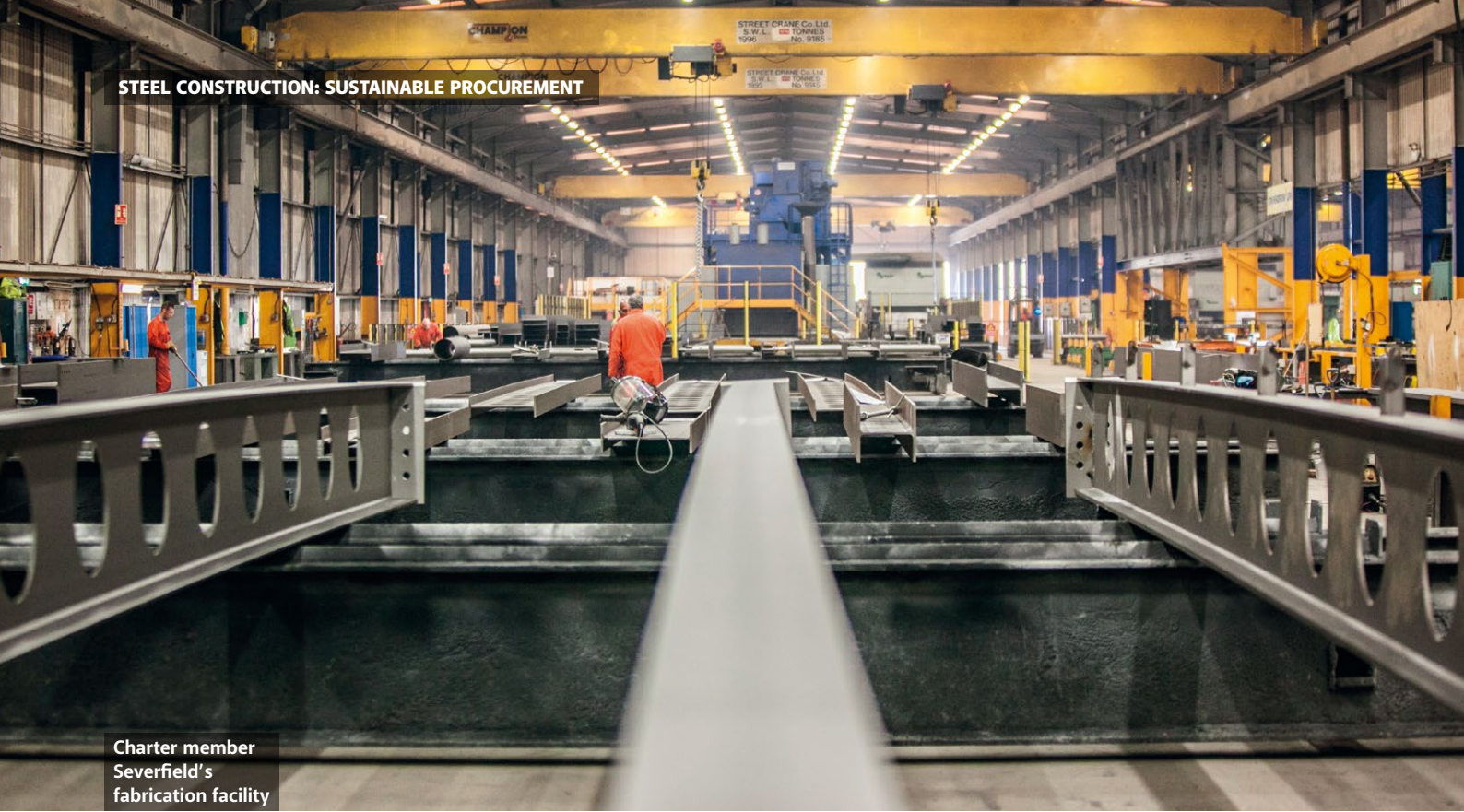
it possible for members to adopt formal sustainability commitments, and the first UK representative organisation of any sort to do so. The Charter has recently been upgraded in line with developments in approaches to combatting climate change and decarbonisation.

Carbon footprint measuring tools based on guidance issued by DEFRA and the Greenhouse Gas Protocol have also been developed to provide a robust and consistent basis for measuring carbon impacts. BCSA members can calculate the carbon impact of their own company operations and demonstrate best practice in this area. They can also calculate the carbon footprint of their products with calculations based on PAS 2050.

## Charter evolved to meet climate emergency

The Charter was substantially updated in 2021 in response to the growing recognition of the climate emergency. It is designed to help improve understanding of sustainability among steel construction companies and to help them manage their businesses in more sustainable ways, promoting carbon reduction, reuse of steel, fabrication efficiency, economic viability, social progress and environmental responsibility. It offers evidence to all involved in the construction procurement process that their structural steelwork suppliers stand beside them in tackling climate change.





Charter member  
Severfield's  
fabrication facility

The Charter now has four ascending levels of membership – Certificate, Bronze, Silver and Gold – which reflect the progress being made by individual steelwork contractors on their sustainability journey.

Steelwork contractors that agree to be bound by the charter formally declare their commitment to a set of sustainable principles and are assessed and monitored against a range of environmental, social and economic criteria during an annual audit.

The Charter membership level achieved depends on the points scored against a set of fifteen requirements:

1. A published sustainability policy.
2. A policy to manage energy, water, waste and business travel.
3. A policy to measure, reduce and report the company carbon footprint.
4. A valid EMS to BS EN ISO 14001.
5. A programme of involvement with the community.
6. A structured training and development programme.
7. A published equal opportunities policy.
8. A published ethical trading policy.
9. A valid H&S management system to OHSAS 18001/BS EN ISO 45001.
10. Use of Life Cycle Assessment (LCA) techniques.
11. A responsible sourcing policy.

12. A valid quality management system to BS EN ISO 9001.
13. Procure 50% of steel from producers with a published decarbonisation roadmap.
14. A commitment to optimise sustainability in design and through reuse.
15. Demonstration of innovation towards sustainable steel construction.

The requirements for each level of Charter membership are:

- Certificate: Minimum 8 points (2 mandatory),
- Bronze: Minimum 14 points (8 mandatory),
- Silver: Minimum 21 points (13 mandatory),
- Gold: Minimum 28 points (all mandatory).

Companies with BES 6001 Very good and Excellent are awarded Gold status of the Charter and do not need to undertake the full Charter application process.

The crucial audit process is carried out by experienced steel construction industry assessors, usually as part of the regular RQSC auditing process that BCSA members undergo. Audits take place annually using site visits and desktop audits.

Sustainability Charter members must have at the very least a viable sustainability policy as well as a credible, approved policy to measure and reduce greenhouse gas emissions, and the flexible, tiered approach of the Charter has

been devised to encourage all members to contribute to sustainable development.

To assist its members on their sustainability journey, BCSA has produced carbon footprint measuring tools, example policies and proformas that can be used by BCSA members to adopt into their own management systems and when completed / acted upon they can then be used to provide a portfolio of evidence that will meet the requirements of the Sustainability Charter.

### More onerous requirements

The 2021 update strengthened the Charter with additional requirements for steelwork contractors specifically focused on the climate emergency, so Members are now encouraged to:

- Measure, report and reduce the company carbon footprint.
- Have a responsible sourcing policy.
- Procure at least 50% (by weight) of steel sections and plate from steel producers with a published decarbonisation roadmap.
- Contribute to efficient and optimised structural designs, taking into account greenhouse gas emissions and the reusability of the steel structure, and to communicate options to clients.
- Demonstrate innovation towards sustainable steel construction.



These new requirements further reflect the growing need to measure and reduce carbon emissions, to promote responsible sourcing throughout the supply chain and to encourage steelwork contractors to innovate and use their expertise through value engineering and engagement within the supply chain.

### Carbon footprint measuring tools

The BCSA carbon footprint tool was first developed in 2008 and has recently been updated to include up-to-date carbon emission factors. The tool is based on the Greenhouse Gas Protocol and is designed specifically for UK steelwork contractors. It is accompanied by a comprehensive user guide and is fully supported by BCSA.

Three versions of the tool are available to BCSA members:

- Version 1 enables the calculation of a company carbon footprint. The scope of this is Scope 1 and 2 emissions as defined in the Greenhouse Gas Protocol.
- Version 2 is more detailed and enables the calculation of a product carbon footprint, i.e. the carbon footprint of fabricated and erected steelwork. The scope of this is Scope 1, 2 and the most significant Scope 3 emissions for steelwork contractors.



Steel erection underway on a Cauntion Engineering project; the company are Sustainability Charter members



Charter members will procure steelwork from a producer with a published decarbonisation roadmap

Barrett Steel and PD Ports

- Version 3 enables the calculation of a project carbon footprint in cases where the steelwork contractor provides other structural products in addition to structural steelwork, as part of a contract. The scope of this includes the Scope 1, 2 and the most significant Scope 3 emissions for hot-rolled primary structural steelwork and generic GHG emissions relating to the manufacture and transport of:
    - Cold-rolled secondary structure members and decking
    - Pre-cast concrete floor units
    - Rebar and mesh
    - In-situ concrete.
1. Baseline greenhouse gas emissions
  2. Current (annual) emissions reporting
  3. Emission reduction targets – a clear statement of the company carbon reduction target over a defined timeframe.
  4. Reporting of progress relative to the benchmark, declared interim targets and the 2050 net zero target.
  5. Carbon reduction projects – describing completed carbon reduction measures completed since the baseline and planned carbon reduction measures.
  6. Offsetting – if carbon offsetting is employed as an interim reduction measure, details of the offsets used must be clearly stated.

### BCSA carbon reduction plan template

Sustainable procurement is also promoted by a company carbon reduction plan (CRP) template and associated guidance, developed by the BCSA for steelwork contractors to report their carbon footprint, to set targets and to monitor their decarbonisation progress.

This CRP template is intended to standardise reporting by BCSA members so that company specific and sector performance can be reported accurately and consistently. The template is aligned with the UK Government Procurement Policy Note (PPN 06/21) published in 2021 and includes:

The Carbon reduction plan template has been developed to align with the following other BCSA initiatives:

- The UK steel construction sector decarbonisation roadmap – which sets out the carbon reduction contribution to be made by UK steelwork contractors by 2050.
- The BCSA carbon footprint tool – which allows BCSA members to calculate their Scope 1 and 2 and/or their Scope 1, 2 and 3 carbon footprint.
- The BCSA Sustainability Charter requirement 3 which requires companies to quantify their greenhouse gas emissions and set reduction targets.





Adey Steel's investment in energy efficient fabrication saved carbon at Seacombe's Mersey Ferry Terminal

# Steelwork contractors deploy for climate change battle

BCSA members are serious about reducing their carbon emissions and raising their sustainability game even higher. Here we look at a few examples showing the directions steelwork contractors are taking on their net zero carbon journeys.

The steel construction sector has always taken pride in steel's high sustainability credentials, but in the drive towards net zero carbon BCSA members recognise that they can't rest on their laurels.

Evidence of the commitment of the BCSA and its members to supporting the climate change battle abound, from producing design guidance on creating buildings that meet the Government's low and zero carbon targets, to researching the environmental impact of steel construction.

The BCSA and its membership are pursuing a wide range of initiatives, many of which are described in detail earlier in this publication such as the BCSA Sustainability Charter, the Annex J Sustainability Specification, SteelZero, CO<sub>2</sub>nstructZero and the 2050 Roadmap.

One of the Roadmap's decarbonisation 'levers' is particularly relevant to steelwork contractors as it is focused on reducing the energy used in the fabrication shop and offices, together with the transport of finished products to site, business travel and

on-site erection activity. Measures already being introduced by BCSA members include investment in energy efficient fabrication equipment, electric vehicles and plant and the introduction of renewable energy technologies at their facilities.

"During the tender and pre-qualification processes, customers are increasingly asking us to demonstrate what sustainability measures we have in place. It's more about governance than cost these days," says Adey Steel Group Operations Director Robert Hall. "We use the Roadmap as a guide to help us achieve a more sustainable business and to show customers what the BCSA aims to do."

Adey Steel employed an external specialist to undertake an energy survey of its business and this resulted in an 11-point plan being put in place to help achieve a more lean and green operation with less CO<sub>2</sub> emissions.

One of the first points to be undertaken was the installation of solar panels, a project that Adey Steel says will, on completion, help generate one-third of its electricity needs and save the business £60,000 per annum.

BHC are another BCSA member that has taken significant strides to become a sustainable steelwork contractor by installing its own wind turbine





## Green steel categorisation

Klöeckner Metals UK Westok has recently launched its new Nexigen® brand, bringing together the entire portfolio of sustainable products and services. Under the Nexigen® brand, the company and its worldwide subsidiaries, will be able to provide transparent, carbon-reduced solutions in the three categories of materials, processing and logistics.

Nexigen® offers a categorisation for transparent carbon emissions and can assist customers with the reliable procurement of CO<sub>2</sub>-reduced steel and metal products, providing full transparency about their carbon footprint from raw material to production.

Nexigen® categories range from START (with a physical footprint from 1,750 to 1,400 kg CO<sub>2</sub> per metric ton) to PRIME (400 to 0 kg CO<sub>2</sub> per metric ton).



Peter Whiting, CEO of Kloeckner Metals UK, says: "We have taken an important step forward with the introduction of Nexigen® and placed sustainability at the core of our growth strategy. We have always emphasised

our commitment to sustainable practices and are excited that we will be able to support our partners and customers in their green transformation and making their progress in sustainability visible."

"Our fabrication facility, like most other steelwork contractors, has some large buildings with big roofs, which are ideal for solar panel installation," adds Mr Hall.

Many of these buildings also need to be tall, because of the fabrication work being undertaken within, and consequently a lot of heat – generated by the processes, was escaping upwards through the roof.

To solve this and make further energy savings, the company has installed a series of de-stratification fans in its fabrication shops that hang from the roof and recirculate hot air, which was previously lost, around the buildings. Adey Steel estimates that this has helped it make a saving of 25 tonnes of CO<sub>2</sub> per year.

Installing solar panels in order to make energy savings is a route that Severfield has also taken. The company's Northern Ireland facility currently has an array of panels helping to generate electricity, while similar plans are also afoot for its other sites, including Severfield's main fabrication facility in Dalton, North Yorkshire. The company has also committed to procuring 100% green electricity across all of its facilities by the end of 2023.

Severfield has also begun a programme to transition to hydrotreated vegetable oil (HVO) mobile equipment across all of its factory and construction sites. Using HVO fuel is said to result in up to 90% reduction in emissions.

Swapping over to vehicles and equipment powered by green fuel is something other steelwork contractors are also undertaking.

Kloeckner Metals UK Sustainability and ESG Manager Sara Halliday, says: "Highlighting our green credentials is very important and we have recently ordered 40 HVO trucks for our fleet, as well as three electric side loader forklifts."

Another way of making significant energy and CO<sub>2</sub> savings, is to install longer lasting and more energy efficient LED lighting, which is something both Kloeckner Metals UK and Adey Steel have done.

BHC is another BCSA member that has taken significant strides to become a sustainable steelwork contractor. "We are fully committed to becoming a net zero carbon business by 2030 in scope 1 (fuels), scope 2 (electricity) and scope 3 (transportation) emissions, related to key business activities.

"We also aim by 2050 to achieve carbon

neutrality across our entire business," says BHC Commercial & Business Development Manager Gary Culbert.

One of the company's initiatives has been the installation of a wind turbine, which now supplies 72% of BHC's electricity at its main facility in Carnwath, central Scotland. The company estimates that without using electricity produced by wind power, it would have emitted an additional 221 tonnes of CO<sub>2</sub> emissions on average per annum.

Another source of electricity is 13 onsite biomass units, ranging in size from 198kW up to 990kW, which have been installed at BHC. Producing green heat, primarily for its paint shop, the units have substantially reduced the scope 1 CO<sub>2</sub> emissions by approximately 1,238 tonnes per annum.

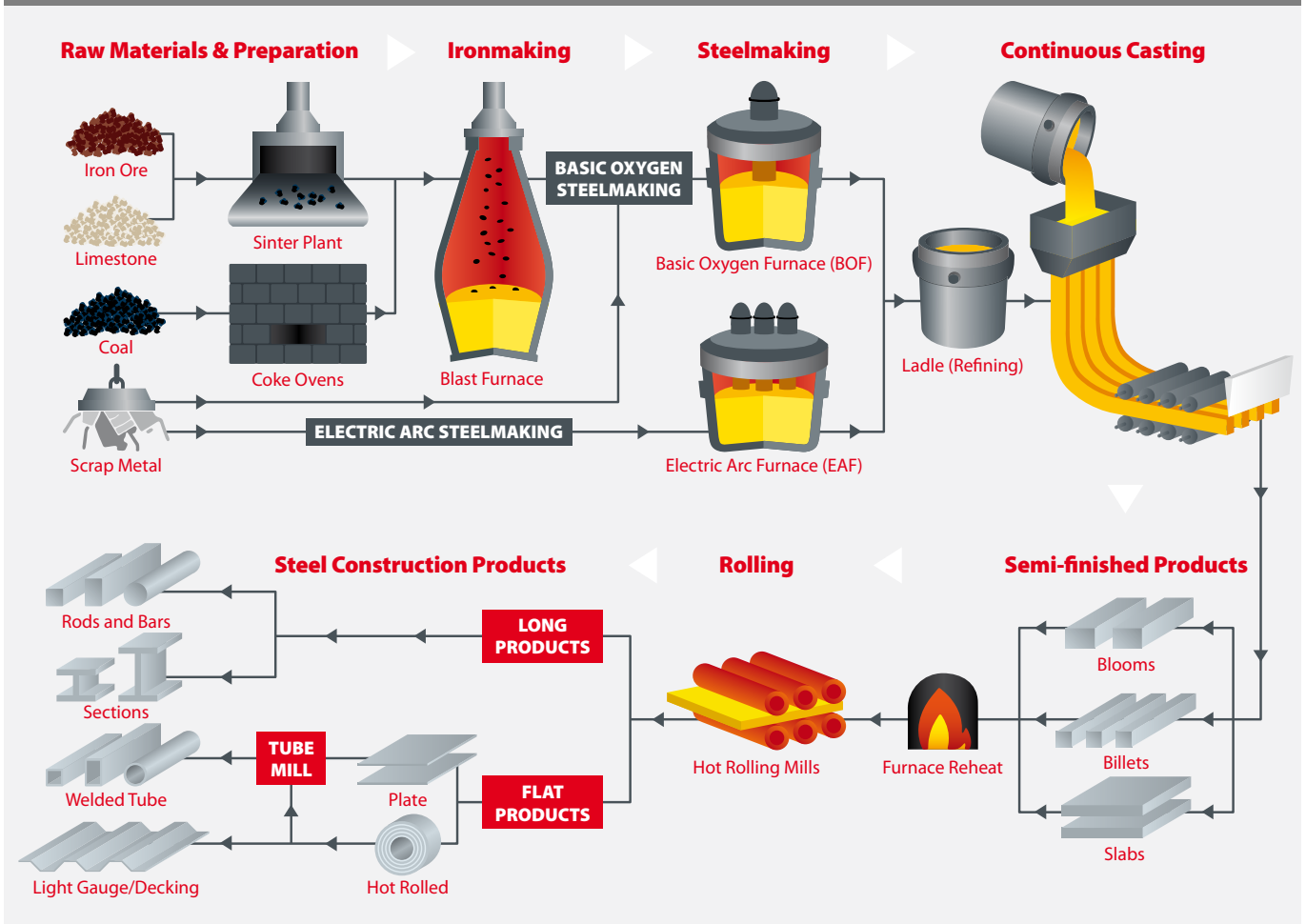
As well as these two initiatives, BHC has received planning permission to build a 600kW anaerobic digestion power plant, which will be completed by 2024. The plant will run off a primary input of organic feedstock delivered from nearby farms and it is estimated that the extra electricity generated by the digester will enable the company to be self-sufficient.

# Sustainable steel procurement



One of the most important considerations for sustainable steel procurement is where the materials come from and how the steel is produced. Here we explain the differences between the two major production processes, which have to be seen as complimentary rather than rivals in the climate change challenge.

Figure 4: Major steelmaking process routes





**W**hen discussing where steel comes from and how it is produced, it is firstly important to look at the two major steelmaking processes.

The primary ore-based steelmaking process using a Blast Furnace and Basic Oxygen Furnace (BF-BOF) and the 100% scrap-based steelmaking process using an Electric Arc Furnace (EAF), together comprise a single global system of supply to meet the increasing worldwide demand.

The principal materials used in the BOF process are molten iron produced in a blast furnace (BF) from iron ore, coking coal and steel scrap. Modern furnaces, or 'converters', take up to 350t of these materials and convert it into steel in around 15 minutes.

A water-cooled oxygen lance is lowered into the converter and high-purity oxygen is blown on to the metal at very high pressure. The oxygen combines with carbon and other unwanted elements, eliminating them from the molten charge.

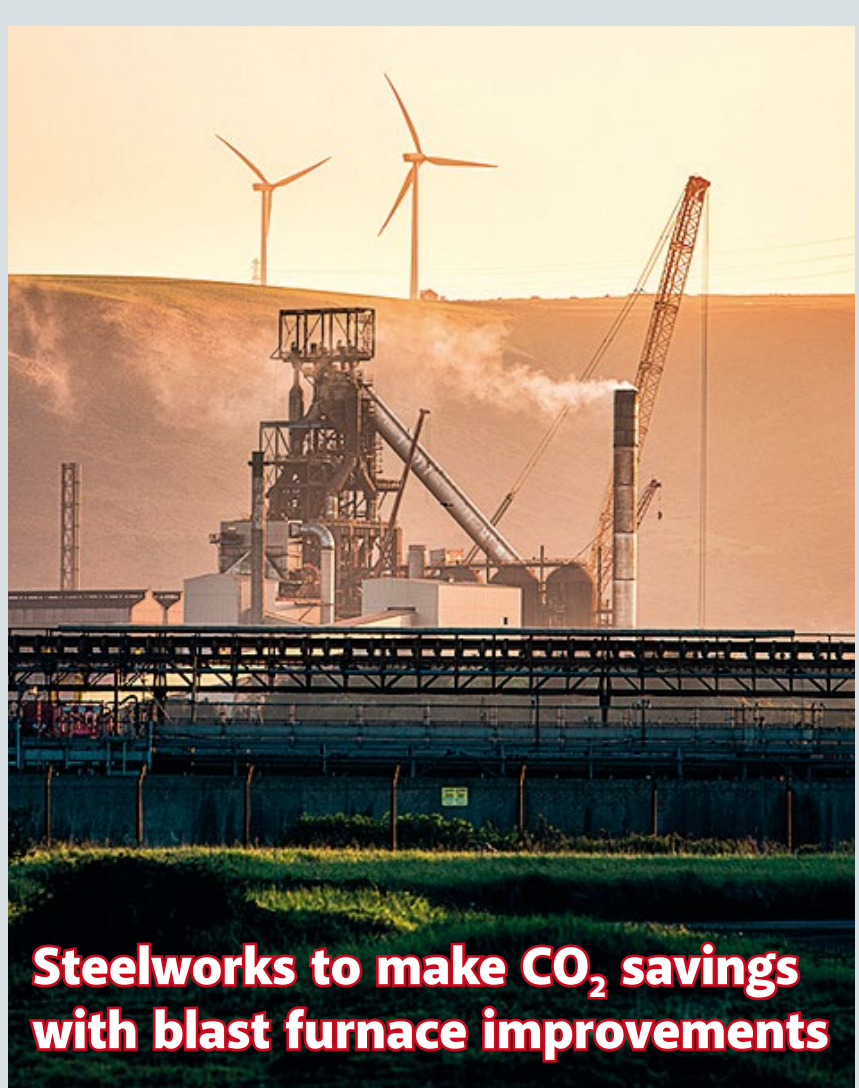
These oxidation reactions produce heat, and the temperature of the metal is controlled by the quantity of added scrap.

After the steel has been refined and samples taken to check temperature and composition, the converter is tilted and the steel is tapped into a ladle. Typically, the carbon content of the steel at the end of refining is about 0.04%. During tapping, alloy additions can be made to adjust the final composition of the steel.

The EAF process uses cold scrap metal as its raw material and can make up to 150t of steel in a single process or 'melt'.

The electric arc furnace consists of a circular bath with a movable roof, through which three graphite electrodes can be raised or lowered. Once the steel scrap is placed in the furnace the electrodes are lowered.

A powerful electric current is passed through the charge, an arc is created, and the heat generated melts the scrap. Lime and fluorspar are added as fluxes and oxygen is blown into the melt to remove impurities.



## Steelworks to make CO<sub>2</sub> savings with blast furnace improvements

Tata Steel has recently introduced digital technology to its two blast furnaces at Port Talbot that will help the plant to make significant savings in both energy and CO<sub>2</sub>.

Known as Topscan, the technology captures 1,000 data points every 10 seconds, giving Tata Steel technicians an uninterrupted 3D view of the material being laid into the top of the blast furnaces. The company said this will help to reduce the amount of coke required and reduce CO<sub>2</sub> emissions by at least 50,000 tonnes annually.

Tata Steel also says a programme of improvements to its two Port Talbot blast furnaces will reduce the site's carbon footprint by a further 160,000 tonnes of CO<sub>2</sub> a year.

The site's furnaces are powered by high-pressure hot blast air that is superheated

to temperatures of more than 1,100°C in seven refractory brick-lined stoves. An improvement programme of work in three of the seven stoves will upgrade the burners that generate heat, with two new best available technology units being installed.

Many of the refractory bricks that store heat and make hot blast air, are also being replaced. The work is being carried out while the remaining operational stoves are in use.

Tata Steel Project Manager Andrew McGregor, says: "Stoves are absolutely critical to the running of our blast furnaces. Any loss of efficiency in heating the air means we either have to use more gas than is optimum, or we have to replace that lost energy by using more metallurgical coke to chemically reduce the iron ore inside the furnaces."





Plate girder erection at Glasgow's Kelvin Hall

### Scrap steel is vital to both BF-BOF and EAF processes

The latest data from the World Steel Association shows that currently 70% of global demand for steel is met by BF-BOF and 30% by EAF. Highlighting the processes' sustainability credentials, both BF-BOF and EAF require significant amounts of recycled content for their production, up to 30% for the former and up to 100% for the latter. Used steel always has a value because it is an essential part of both production processes.

These proportions are predicted to change significantly in the coming years with the drive towards low and zero-carbon steelmaking coupled with increased availability of scrap driving new steelmaking capacity towards EAF rather than BF-BOF.

European steel producers have worked diligently over the past two decades to reduce the carbon footprint of the steel produced through traditional integrated steelmaking, having accomplished the lowest levels possible from a scientific perspective.

All of the major producers of steel

supplying the UK market have an ambition to support the UK's target to be net zero by 2050. Currently using the BF-BOF process, British Steel's ambition is for low embodied carbon steel production with a phased reduction of CO<sub>2</sub>.

The company says its Low-Carbon Roadmap will deliver net zero steel by 2050 and significantly reduce CO<sub>2</sub> intensity by 2030 and 2035.

British Steel will adopt a science-based target in order to validate the reductions achieved to help keep global warming well below 2°C and pursue efforts to limit warming to 1.5°C.

### BF-BOF production best suited for heavy steel plate girders

Structural steel sections of the same size, strength and quality can be produced by either the BF-BOF or the EAF route.

Rolled sections used in the UK and the Republic of Ireland are supplied by steelmakers using both BF-BOF and EAF production methods. However, when it comes to sourcing

plate, the BF-BOF method is best suited to producing the standard of steel plate used to fabricate girders for the construction sector. Traditionally, it has been more difficult to make plate and hollow sections from scrap steel due to the variable nature of the feedstock.

ArcelorMittal uses both BF-BOF and EAF processes around the world, but interestingly, all of the rolled sections the company supplies to the UK steel market are produced by the latter.

With a much lower carbon footprint, clients and their design teams quite often want to specify and use EAF sections to help them achieve their low embodied carbon targets on their projects. But what does this achieve within the global context of greenhouse gas emissions?

Global demand for new steel currently exceeds the supply of scrap steel by a factor of around three and therefore, to meet this growing demand, new steel has to be produced from iron ore, primarily today using the BF-BOF production route.

Supplies of ferrous scrap are growing



globally, but are finite and exclusively specifying 100% scrap-based EAF steel will result in an increased demand for scrap that cannot be met and is not only unsustainable but may also drive-up scrap prices.

### Specifying only EAF steel will not help reduce carbon

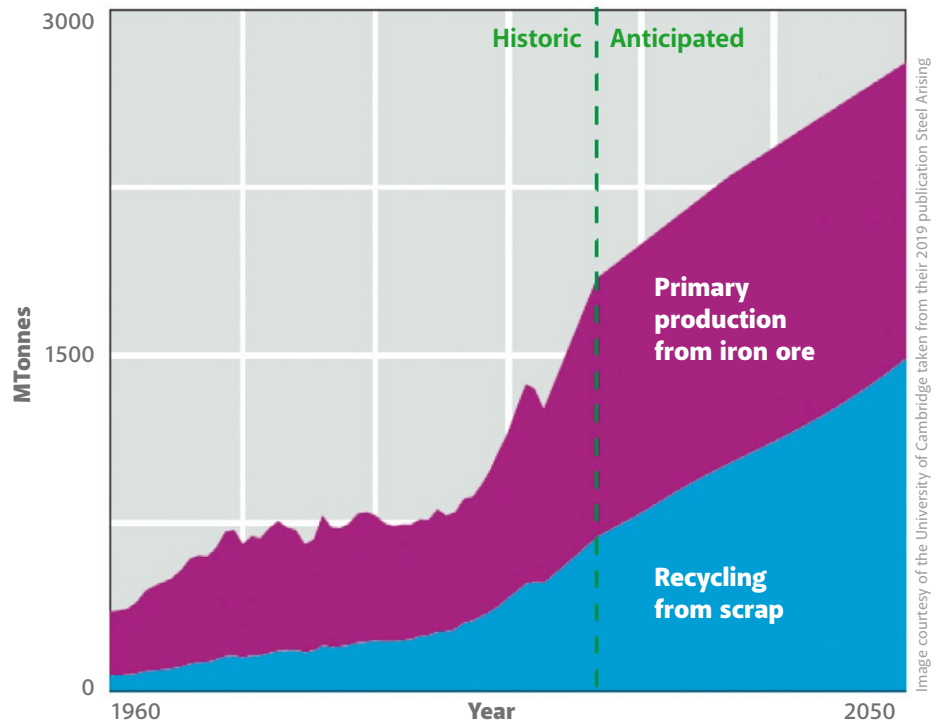
Within the global carbon emissions context there is no point specifying 100% recycled steel (in preference to BF-BOF steel) as this will mean that BF-BOF steel will be required to substitute EAF production to meet the excess global demand elsewhere. In addition, specifying EAF steel imported to the UK adds further transportation impacts.

However, the global carbon benefit of recycling steel is exactly the same wherever in the world the steel is recycled; the most important point is that steel is recovered and recycled or reused.

No one doubts that EAF production has an important role to play in the long-term decarbonisation strategy for steel, however switching steel made via the BF-BOF route to EAF production will not reduce global carbon emissions in the short-term.

It is seen as vital that efforts to decarbonise primary steelmaking are prioritised since this is the only way that global steel demand can be met within the carbon reduction commitments of the Paris Agreement.

Figure 5: Anticipated global demand for steel to 2050



In recognition of the fundamentally different production impacts of steel sections, the finite global availability of 100% scrap-based EAF steel and the short-term need to prioritise decarbonising BF-BOF steelmaking, a different approach is required to quantify the embodied carbon of steel that incentivises all steelmakers to decarbonise. A single embodied carbon target based on unit floor area as adopted by LETI and RIBA etc. cannot address this broader challenge.

All steel production routes are currently needed to meet global demand and all steel mills need to decarbonise. A rating system based on that currently used for energy efficiency of electrical appliances has been proposed by ResponsibleSteel and SteelZero.

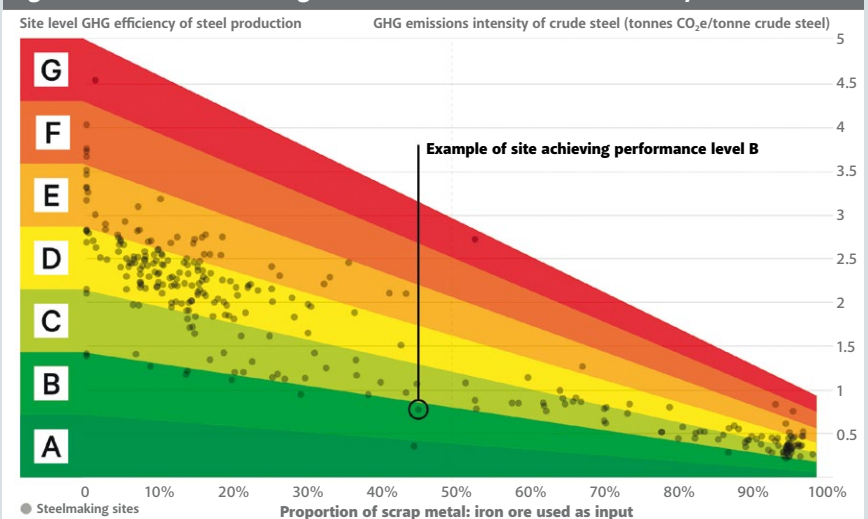
Such an approach is more conducive to achieving the overall objective of minimising global carbon emissions than a single embodied carbon metric focused on individual buildings projects, i.e. a kgCO<sub>2</sub>e/m<sup>2</sup> metric.

## Proposed rating system

The approach defines low embodied carbon steel as a function of recycled content input.

The figure shows the distribution of a number of global steelmaking sites in terms of carbon emissions per tonne of crude steel production; the cluster of results to the left (up to 30% recycled content) reflects BF-BOF production sites and the cluster to the right, near-100% scrap-based EAF production.

Figure 6: Performance banding for crude steel GHG emissions intensity



Source: Matthew Wenban-Smith (2021), 'Achieving Net Zero in the Steel Sector', Chatham House Sustainability Accelerator, 2 November 2021, <https://accelerator.chathamhouse.org/article/achieving-net-zero-steel>. Includes underlying data from the CRU Steel Cost Model and Emissions Analysis Tool (2021)

Select companies that have a certified environmental management system and a certified responsible sourcing policy

# Specifying and procuring sustainable structural steelwork – Conclusions

**This publication is designed to communicate to procurement professionals and their engineering, architectural and cost advisers that strong sustainable approaches to the built environment are available now, and to illustrate how steel construction already has strong circular economy credentials that they can take advantage of immediately.**

**M**uch remains to be done of course to achieve net zero carbon by the government target date of 2050, but the steel construction sector aims to accompany and support its supply chain and customers on their journey.

Sustainable Procurement means taking a holistic approach to tackling the environmental problems facing the world. Reducing carbon emissions and embodied carbon are key considerations when infrastructure assets are

being procured, but sustainable development also demands attention to the social and economic pillars of sustainable construction.

Holistic approaches to sustainability are essential and will involve circular economy considerations as we move away from the ‘take, make and dispose’ procurement models of the past towards ‘reduce, reuse, repair and recycle’ approaches – which will be familiar to clients and designers experienced in steel construction as reuse and recycling are two of the strongest virtues of constructional steelwork.

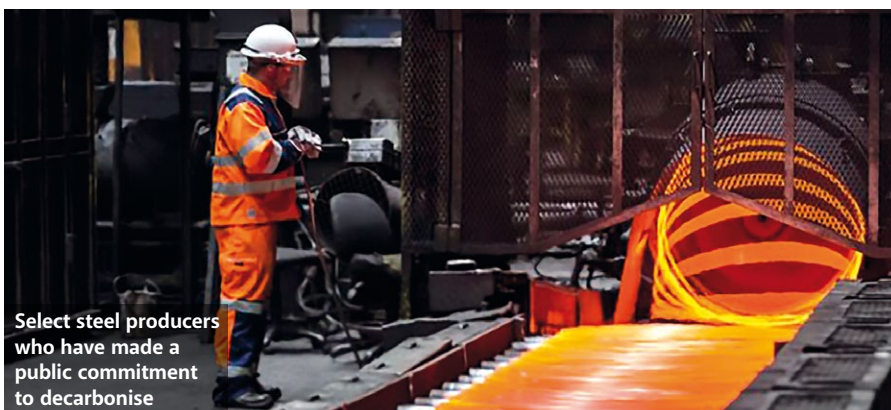
The strengthened emphasis on efficient design in the BCSA’s 2050 Roadmap to net zero carbon will increasingly eliminate any temptation to non-optimal specification of steel and other materials. Steel also lends itself easily to repair, if required, as redundant or damaged sections are easily cut out and sent for recycling and replaced with either previously used material or sustainably produced new steel sections.

Businesses all along the supply chain realise that more sustainable approaches can contribute to their long-term profits as well as make a contribution to climate change. Failure to do anything of course will not be an option anyway, as governments and regulators, investors and the public will prove hostile to that approach.

Environmental, social and corporate governance (ESG) considerations mean no reputable company, whether a developer or funder, will run the risk of reputational damage through neglecting circular economy principles. Building owners and tenants will demand sustainable structures to help them manage their Scope 3 emissions.

The introduction of statutory embodied carbon targets might not be far away, which would be a game changer for many.

Procurement professionals and their engineering advisers have a responsibility to be aware of the full, circular economy carbon implications of making design and materials



Select steel producers who have made a public commitment to decarbonise



choices. Steel construction scores highly on all such considerations, a science-based case that has been made strongly in successive BCSA initiatives over the years.

The embodied carbon and other carbon aspects of projects can be calculated using easily accessible tools provided by the steel sector and in daily use by BCSA members.

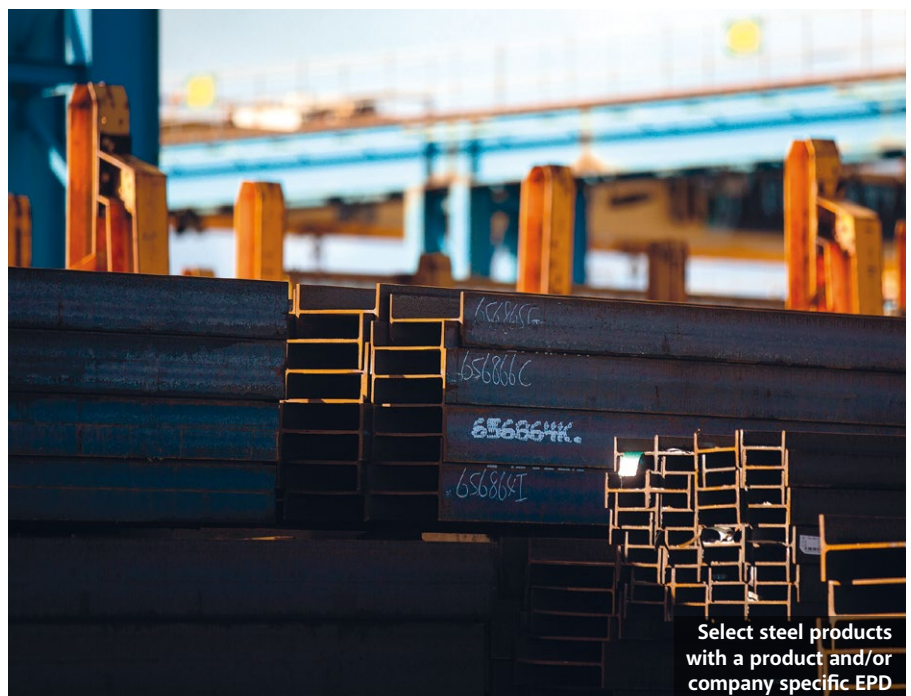
Using these tools and others that will be developed as the journey to net zero carbon picks up pace will provide much needed reassurance to procurement professionals that sustainability is being pursued as vigorously as current technology allows.

## Recommendations for specifying and procuring sustainable structural steelwork

- Use the NSSS and follow the sustainability guidance in Annex J.
- Select steelwork contractors that meet the requirements of the RQSC.
- Select steelwork contractors who have the BCSA Sustainability Charter.
- Select steelwork contractors who are members of SteelZero and/or CO<sub>2</sub>nstructZero.
- Select companies that have a certified environmental management system and a certified responsible sourcing policy.
- Select steel products with a product and/or company specific EPD.
- Select companies that measure and report their carbon emissions and have committed to carbon reduction targets.
- Select steel producers who have made a public commitment to decarbonise in line with UK or international net zero targets and are ResponsibleSteel certified and/or have committed to a quantitative, science based GHG emissions reduction target.
- Set carbon intensity targets for structural steel, based on a performance banding that includes both BF-BOF and EAF steelmaking.



Select steelwork contractors who have the BCSA Sustainability Charter



Select steel products with a product and/or company specific EPD



### **Steel for Life**

Steel for Life is a wholly owned subsidiary of BCSA, created in 2016, with funding provided by sponsors from the whole steel supply chain. The main purpose of Steel for Life is to communicate the advantages that steel offers to the construction sector. By working together as an integrated supply chain for the delivery of steel-framed solutions, the constructional steelwork sector will continue to innovate, educate specifiers and clients on the efficient use of steel, and market the significant benefits of steel in construction.

### **British Constructional Steelwork Association**

BCSA is the national organisation for the steel construction industry: its Member companies undertake the design, fabrication and erection of steelwork for all forms of construction in building and civil engineering. Industry Members are those principal companies involved in the direct supply to all or some Members of components, materials or products. Corporate Members are clients, professional offices, educational establishments etc which support the development of national specifications, quality, fabrication and erection techniques, overall industry efficiency and good practice.

### **[www.steelconstruction.info](http://www.steelconstruction.info)**

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