SUPPLY CHAIN SUSTAINABILITY SCHOOL

Decarbonising Steel: Shaping a Cleaner, Greener Industry

Virtual Conference

21 September 2023 – 10:00-12:00

SUPPLY CHAIN SUSTAINABILITY SCHOOL

Welcome

James Cadman
Action Sustainability
Head of Consultancy & Climate

House Rules

Participant microphones and cameras are off during this Conference

If you have **QUESTIONS**, feel free to post in the Zoom Q&A

Registered delegates attending will receive a CPD certificate

Slides, Recording & Resource links will be distributed afterwards

SUPPLY CHAIN SUSTAINABILITY SCHOOL

Agenda

10:00	Welcome and Introductions
10:10	The Strategic Context
10:30	The Demand for Steel: Infrastructure Projects
11:00	The Demand for Steel: Construction
11:10	Steel Supply, Solutions and Innovation
11:50	Questions and Answers

SUPPLY CHAIN SUSTAINABILITY SCHOOL

The Strategic Context

Matthew Wenban-Smith
Responsible Steel
Senior Advisor

Sameen Khan
The Climate Group
Senior Manager Steel

SUPPLY CHAIN SUSTAINABILITY SCHOOL

The Strategic Context

Matthew Wenban-Smith
Responsible Steel
Senior Advisor

Decarbonising Steel

Matthew Wenban-Smith, Senior Advisor to ResponsibleSteel

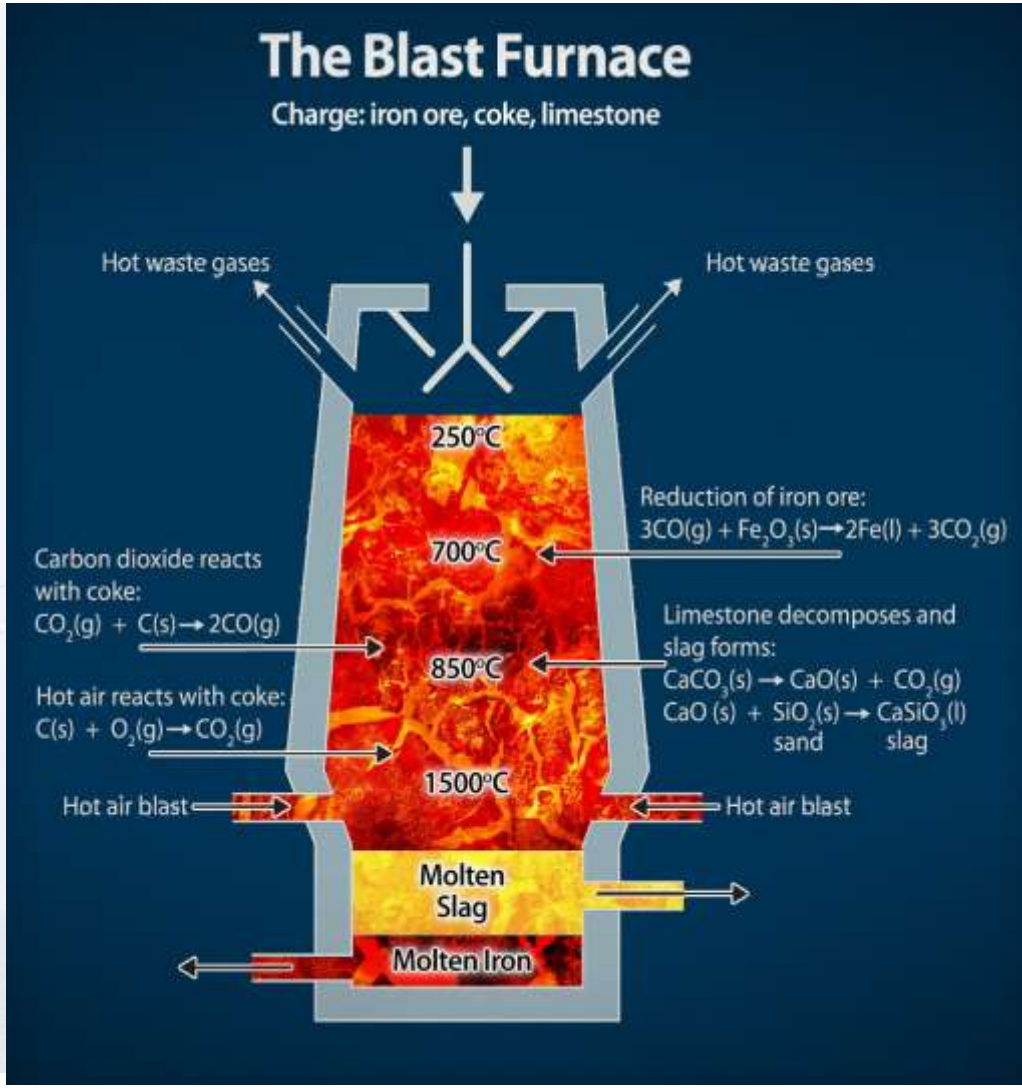
21st September 2023

Content

1. Climate change and steelmaking
2. Steel's 'near zero' challenge
3. How to support decarbonisation of the steel sector?

Climate change and steelmaking

- Climate change
- Steel contributes 7 – 9% of global Greenhouse Gas (GHG) emissions
- >2.6 gigatonnes CO_2/year:
  - 2.7 billion tonnes of iron ore
  - +/- 10% of world's coal
  - Natural gas
  - Electricity (more coal, more natural gas)
  - Limestone
  - Chromium, Nickel, Manganese, Tin…
- >90% of steel's GHG emissions are from primary production



Steel’s ‘near zero’ challenge

Three options

a. Use less steel

b. Use more scrap

c. Decarbonise steelmaking

a. Use less steel

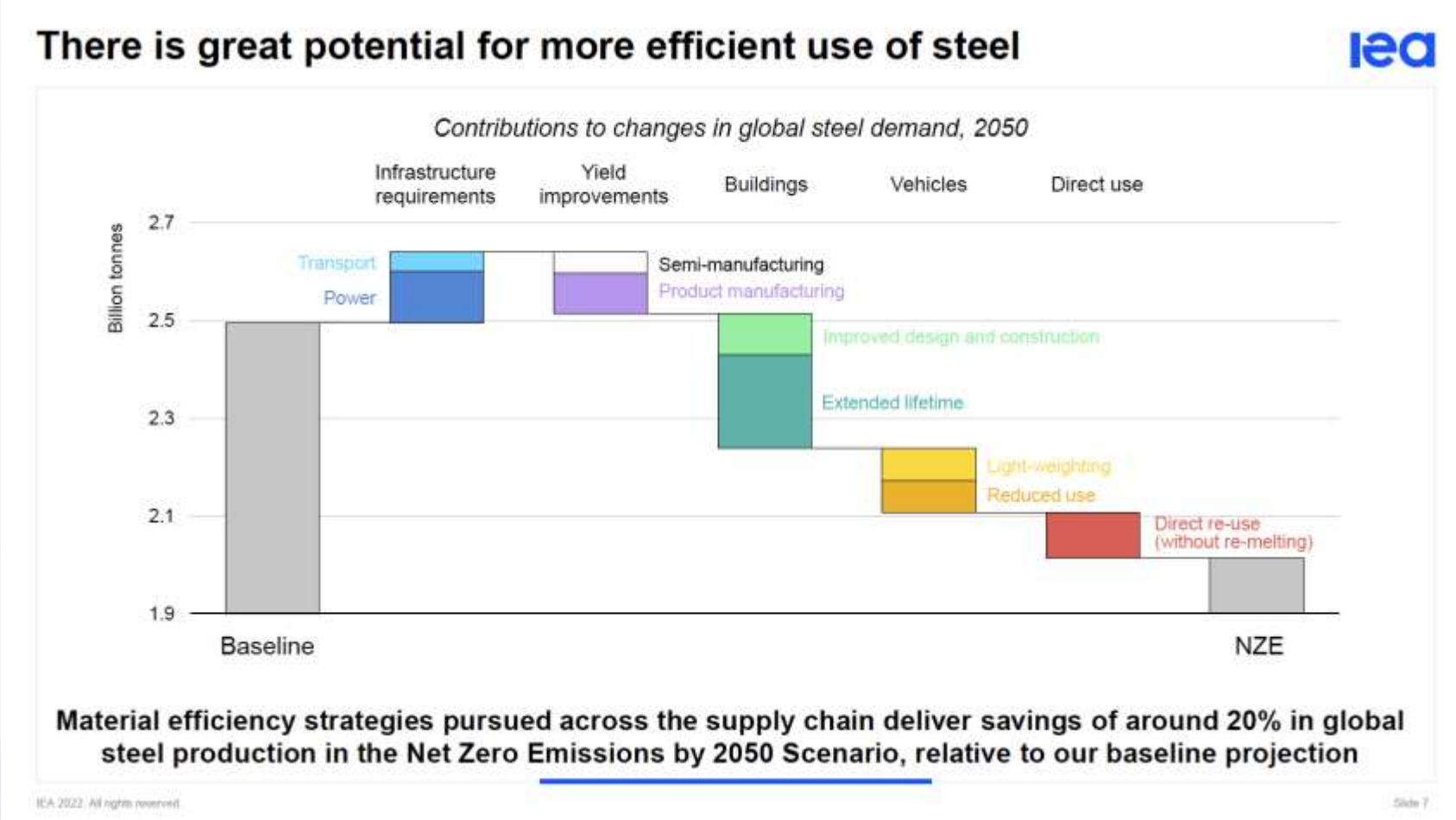
- We do need steel
- (Some things need *more* steel)

But we must be more efficient

- Manufacturing efficiency
- Buildings:
  - improved design and construction
  - extended lifetime
- Vehicles:
  - light-weighting
  - reduced use
- Direct use (without remelting)

IEA Net Zero Scenario demand in 2050

- **+/-2.0 billion tonnes**



b. Use more scrap

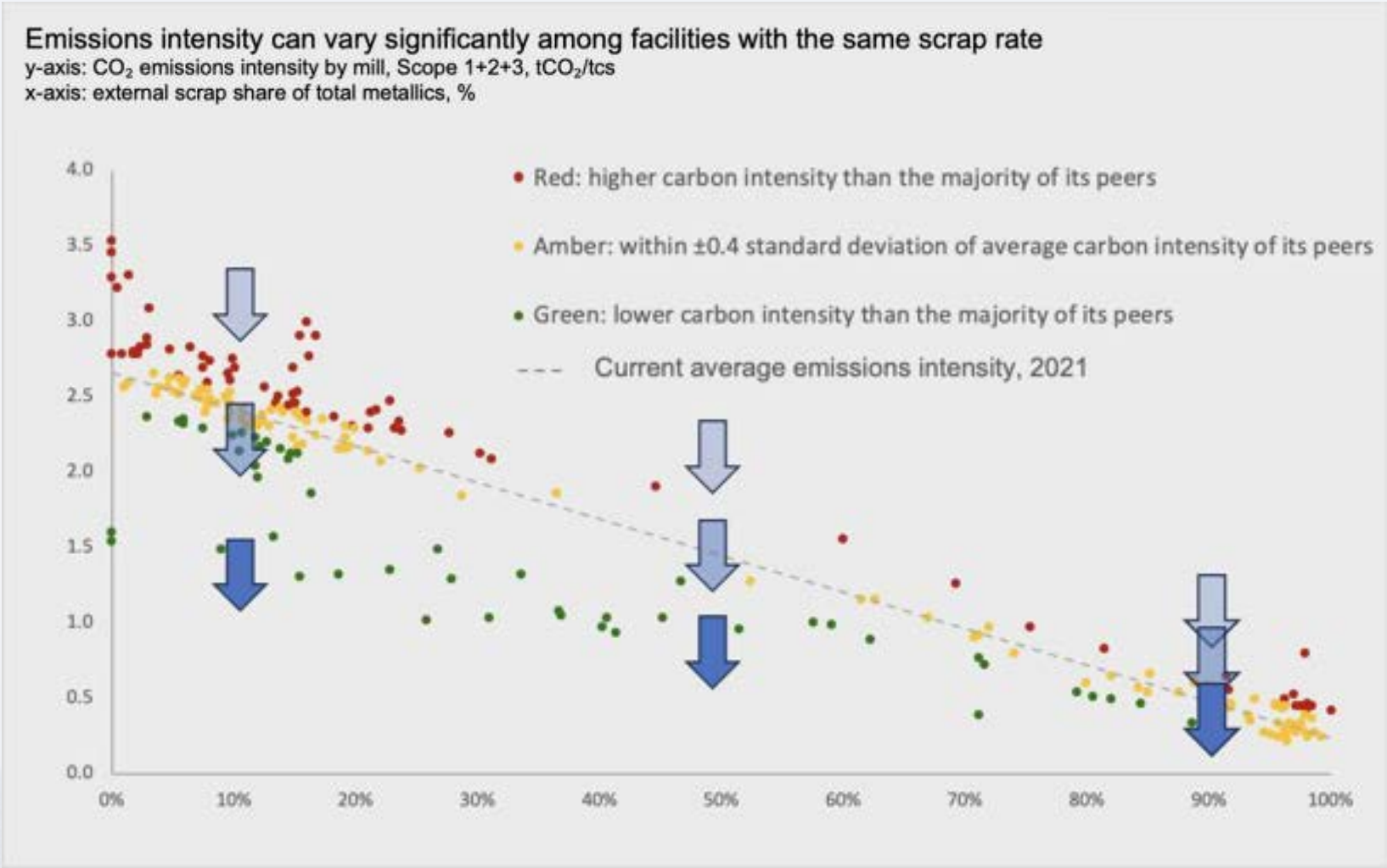
- Steel made from scrap has +/- 20% the carbon footprint of primary steel made from iron ore – we must use all available scrap!!
- But…
  - Lifetime of steel in use: +/- 40 years
  - +/- 84% of available scrap currently used
  - This meets +/- 30% of demand for steel

- ➢ Steelmakers: use all available scrap
- ➢ +/- 45% of steel production from scrap by 2050
- ➢ There's not enough scrap

c. Decarbonise steelmaking

- **Technically**
  - Operational efficiencies: upstream and direct emissions
  - Low carbon electricity
  - Carbon capture and storage
  - Hydrogen
  - Direct electrolysis
  - Biomaterials

- **Cost:** US$3 trillion to US$5 trillion
- **Time:** critical



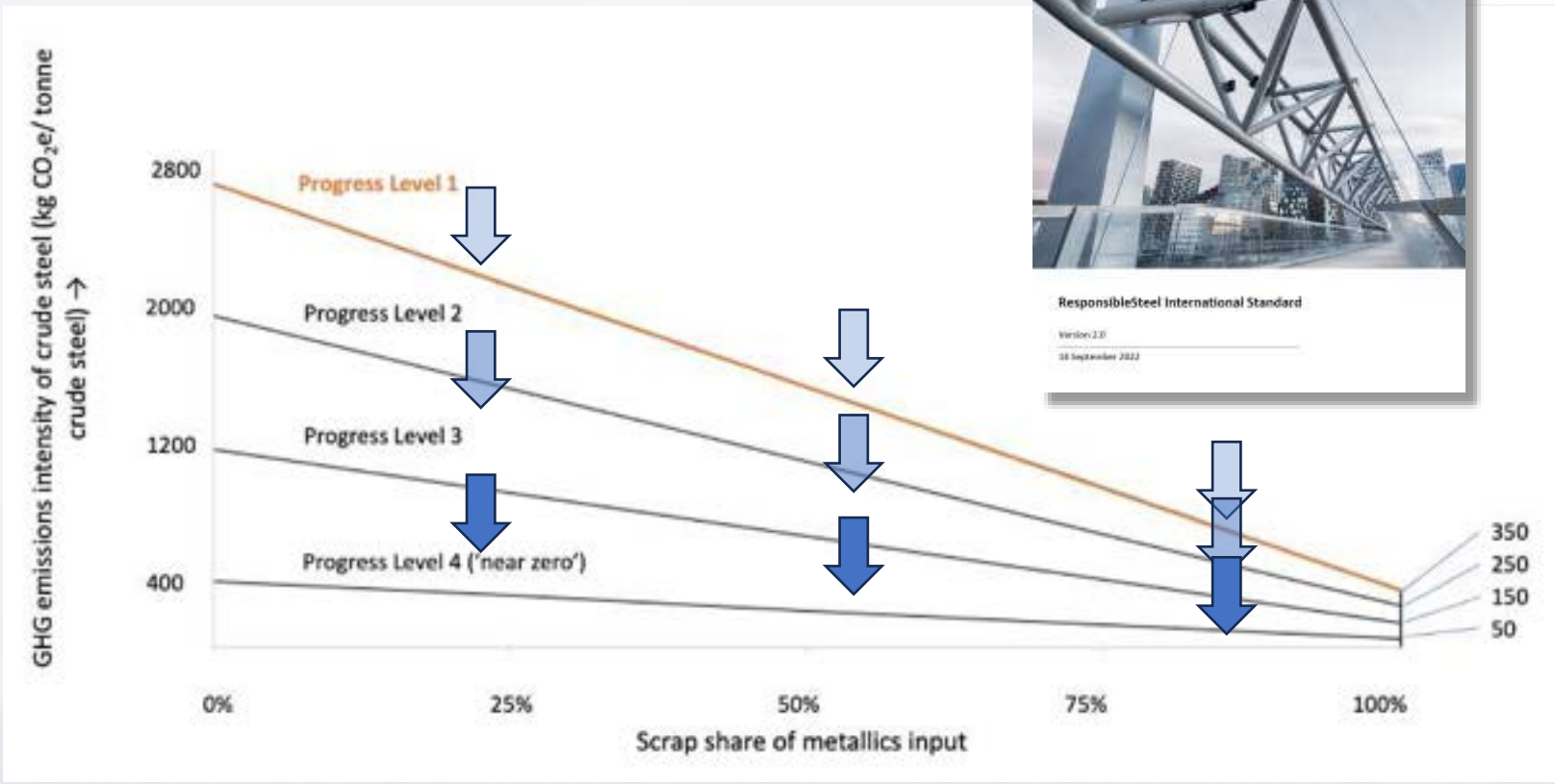
Source: CRU Steel Cost Model

How to support decarbonisation of the steel sector?

- Use steel efficiently
- Support scrap collection
- Support decarbonisation of *all* steelmaking, whatever the technology, and however much scrap is used:
  - Operational efficiencies
  - Zero carbon energy
  - CCS
  - Hydrogen
  - Biomaterial
  - Direct electrolysis
  - …

How to support decarbonisation of the steel sector?

1. Specify steel on the basis of ‘decarbonisation progress level’
2. Use product carbon footprints to compare different materials, suppliers and designs based on this pre-specification.



Thank you

If you would like to find out more about ResponsibleSteel and its international standard please contact:

info@responsiblesteel.org

- https://www.responsiblesteel.org/
- https://accelerator.chathamhouse.org/article/achieving-net-zero-steel
- https://sustainability.crugroup.com/article/cru-shares-thoughts-on-green-steel
- https://www.iea.org/reports/iron-and-steel-technology-roadmap
- https://www.iea.org/reports/emissions-measurement-and-data-collection-for-a-net-zero-steel-industry
- https://www.iea.org/reports/achieving-net-zero-heavy-industry-sectors-in-g7-members

SUPPLY CHAIN SUSTAINABILITY SCHOOL

The Strategic Context

Sameen Khan
The Climate Group
Senior Manager Steel

Demand signal to accelerate steel decarbonisation

Sameen Khan
Senior Manager, Steel
skhan@climategroup.org

CLIMATE GROUP
STEELZERO

Introducing SteelZero

SteelZero is a global initiative led by Climate Group, in partnership with ResponsibleSteel, that brings together leading organisations to speed up the transition to a net zero steel industry.

2023 Status

38
Members

6
Key Sectors

10m
Tonnes annual steel procurement of members (approx)

- ✓ Developed in collaboration with members, collaborators and partners
- ✓ Details six key principles
- ✓ Download here

What does SteelZero do?

Our purpose is to support industry transition towards net zero steel by catalysing global demand and sending a clear market signal through an ambitious commitment.

Our goal is to create a market for 100% net zero steel by 2050, latest, supported by an ambitious interim commitment to use 50% low embodied carbon steel by 2030.

Our strength is our members; pioneering businesses who make a public commitment in support of this transition. By harnessing their collective purchasing power and influence, we can catalyse demand, incentivise investment and remove regulatory barriers and instruct government policies to enable faster market transition.

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The SteelZero Commitment

An overarching goal

A public commitment to procuring, specifying or stocking 100% net zero steel by 2050.

Supported by interim action

A public commitment to procuring, specifying or stocking 50% of steel requirement by 2030, meeting one or a combination of:

- **a.** Steel produced by a steelmaking site where the steelmaker has a science-based emissions target, SBTi or equivalent
- **b.** ResponsibleSteel™ Certified Steel, or equivalent
- **c.** 'Low Embodied Carbon Steel' – as defined in SteelZero Commitment Framework

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Our members

SteelZero members span the steel supply chain across a diverse range of sectors, from the construction and automotive industries to renewable energy and shipping.

lendlease
wsp
MULTIPLEX
mace
VIACON
SKANSKA
KILNBRIDGE
GROSVENOR
Severfield
Robert Bird Group
Member of the Surbana Jurong Group
CIMC TCREA 中集同创
Landsec
deconstructuk.com
MetStructures
BURO HAPPOLD
MAERSK
Billington
Structural Steelwork
WALSH
Balguard
TRANE TECHNOLOGIES
MORROW LORRAINE
British Land
BUILDERS SISK CONTRACTORS
J&D Pierce
EIFFAGE SMULDERS
Ørsted
SIEMENS Gamesa
RENEWABLE ENERGY
EIFFAGE MÉTAL
bourne GROUP
BARRETT STEEL LIMITED
BHC Ltd
BMSTEEL
HARE
Chopard GENÈVE
VOLVO
SKF
IBERDROLA
VATTENFALL
Business Area Wind

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STEELZERO

SteelZero members generate guidance for supplier engagement

“At the B+M Group we have been working hard to reduce our carbon footprint over the last 5 years. The discussions and ideas that we have generated in the short time since we have been members of SteelZero, gives us lots more to do and we are very excited to be working with industry leaders on making further improvements to our business that will continue to make a positive impact on our world.”

Mike Walton, CEO of B+M Steel


CLIMATE GROUP
STEELZERO

In partnership with Responsible Steel

SteelZero Supply Chain Engagement: *Guidance Note for Construction and Property*

Themes throughout this Blueprint:

- Engage all stakeholders in the potential steel supply chain at the earliest possible stage; share high level embodied carbon targets and define specific steel requirements.
- Ensure an iterative approach to engagement as design is developed: consulting and re-engaging relevant stakeholders on progress and design adjustments throughout.

Links: SteelZero members; ResponsibleSteel members; SBTi - Companies taking

0	1	2	3	4	5	6	7
Strategic Definition	Preparation and Briefing	Concept Design	Spatial Coordination	Technical Design	Manufacturing and Construction	Handover	Use

Stakeholder interactions

Actions

Reflections: During stages 0 through 7, all stakeholders can reflect on the embodied carbon performance or calculate successes and acknowledge learnings.

Reference Resources

Other Resources

Steel Zero Supply Chain Engagement: Buildings and Construction

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SteelZero members embed the commitment into their project specifications

- Architects and construction and property companies in SteelZero wanted to understand how they could build the SteelZero commitment into their procurement policies
- Construction and property company **WSP** shared the internal work they had done and the outcome of how they now describe lower emission steel requirements in their specifications
- The peer to peer learning received positive feedback, e.g. ‘I’m really excited to receive this spec and for [colleagues] globally to think about how we can engage it.’

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SteelZero members accelerate progress through direct supplier engagement

British Steel case study

Nov 2020

- **SteelZero launched**
- Founding members include British construction companies

Oct 2021

- 7 Oct: **British Steel cites SteelZero as the reason they are setting science-based targets**.

  'Many of our customers require us to have climate change targets and be working to reduce our CO_2 intensity. The SteelZero initiative is a scheme that customers can sign up to in order for them to demonstrate their commitment to carbon reductions…Based on the adoption and growth of SteelZero, it's deemed to be the best approach to adopt a science-based target'[1]
- 11 Oct: British Steel helps identify ways to cut carbon emissions by improving waste heat recovery from furnaces

2022

- January: British Steel joins £1.4 million by-products study
- March: British Steel **welcomes green hydrogen** project on Teesside
- June: British Steel forges partnership with Drax to support world-leading carbon capture project

2023

- Feb: British Steel passes quality audit
- March: Launch of inaugural Decarbonisation Action Report

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SteelZero members contribute to the development of tools and frameworks

Reporting framework

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STEELZERO

Name of SteelZero member company

PLEASE FILL OUT COLUMNS IN YELLOW ONLY
DO NOT TRY TO FILL OUT COLUMNS IN GREEN - THESE WILL AUTO-FILL

The green columns will auto-fill from data inputted into the 'Breakdown and Evidence' worksheet

Overview	Please specify the period for which you are reporting (one whole year of data, as recent as possible)	Headquarters	Regions in which you operate and the nature of those operations	Total company revenue for your last financial year in US$ (please state financial year)	Your progress towards your SteelZero 2030 commitment	Steel bought, specified or stocked in specified reporting year (metric tonnes)	Amount of steel that fulfils one or more of the SteelZero 2030 interim commitment pathways (metric tonnes)	TARGET = 50% BY 2030 Percentage of steel that fulfils one or more of the SteelZero 2030 interim commitment pathways
						0	0	#DIV/0!

EPD/certificate info		GHG emissions intensity in metric tonnes of CO2e/metric tonne of crude steel (EPD modules A1-A3)	Percentage recycled content
EPD or certification programme	Standard that the certificate is based on		

Reporting pathway that this steel fulfils (A, B, C or a combination - type Y in all that apply)		
A (science-based target at corporate level)	B (ResponsibleSteel progress level certification)	C ('low-embodied carbon steel')

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Why join SteelZero?

Making change happen. SteelZero members 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 net-zero steel. They're raising ambition and giving their supply chain confidence to transition to 100% net-zero steel.

Setting the agenda. SteelZero enables leading organisations, their peers and suppliers to address barriers in their steel supply chains. The SteelZero team co-ordinates working groups and roundtables to assist organisations in developing a roadmap to fulfil their commitment to net-zero steel.

Future-proofing. SteelZero members are preparing for inevitable changes across their supply chains to remain economically competitive in the transition to a low-carbon world.

Our member's perspectives

…"Provides an opportunity to be a part of the conversation, to learn in a collaborative peer group and **develop the language that speaks to the entire supply chain**. It is the power of **collective decision** that makes the commitment possible."

…"**Direct access** to the supply chain, understanding their challenges, understanding where & how to **maximise impact** from an organisational perspective - impact which will make it possible for everyone to **deliver to the promise**."

…"SteelZero is about **being part of the solution**. It provides **collective understanding and a means** to reach a common goal. **Knowledge sharing** is the key, open dialogue – conversation and collaboration with the supply chain that makes the change possible."


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STEELZERO
In partnership with
Responsible Steel
standards & certification
Let’s drive climate action.
Fast.

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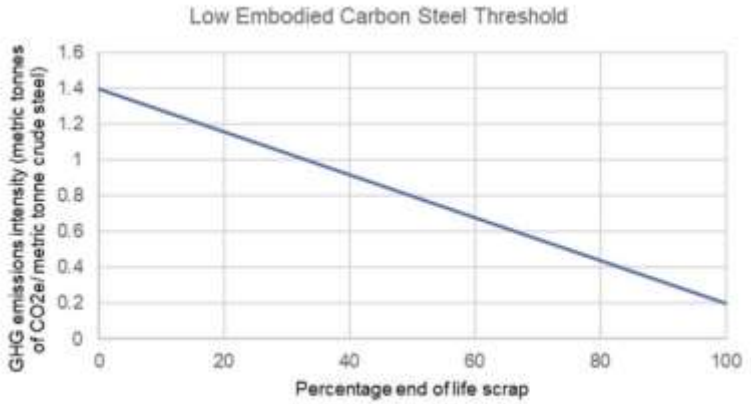
STEELZERO

SteelZero ‘low embodied carbon’ steel

Low Embodied Carbon Steel is defined as crude steel with a GHG Emissions Intensity of less than or equal to the 2030 target threshold in accordance with the following formula:
2030 Target Low Embodied Carbon Steel GHG Emissions Intensity threshold for crude steel
= (X tonne CO2 / tonne) + (1 - % end of life scrap) x ((Y - X) tonne CO2 / tonne))

Where:
X = 0.2 metric tonnes of CO2 equivalent/ metric tonne crude steel (the target GHG Emissions Intensity for Crude Steel produced in 2030 if produced from 100% end of life scrap)
Y = 1.4 metric tonnes of CO2 equivalent/ metric tonne Crude Steel (the target GHG Emissions Intensity for Crude Steel produced in 2030 if produced from 100% iron ore)



Low embodied carbon steel threshold update: data points are under review in order to reflect the most up to date science-based information

SUPPLY CHAIN SUSTAINABILITY SCHOOL

The Demand for Steel: Infrastructure Projects

Sophie McCullagh
Department for Transport
Commercial Lead

Giles Price
Department for Transport
Head of Supply Chain Management

Robin Lapish
HS2 Ltd
Supply Chain Lead

Ryan Metson
SCS JV
Procurement Manager Plant and Materials Lead

Jane Fox
National Highways
Steel Category Group Lead

SUPPLY CHAIN SUSTAINABILITY SCHOOL

The Demand for Steel: Infrastructure Projects

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Department for Transport

DfT Steel Sector Strategic Engagement

21st September 2023

Official Sensitive

About DfT

Vision

connecting people & places

We work with our agencies and partners to support the transport network. We plan and invest in transport infrastructure to keep the UK on the move.

Strategic Aims

Growing & Levelling Up the Economy

Reducing our Environmental Impact

Improving Transport for the User

ALBs and Agencies with steel demand

HS2

NetworkRail

national highways

east west RAIL

Northern Lighthouse Board

Supply Chain

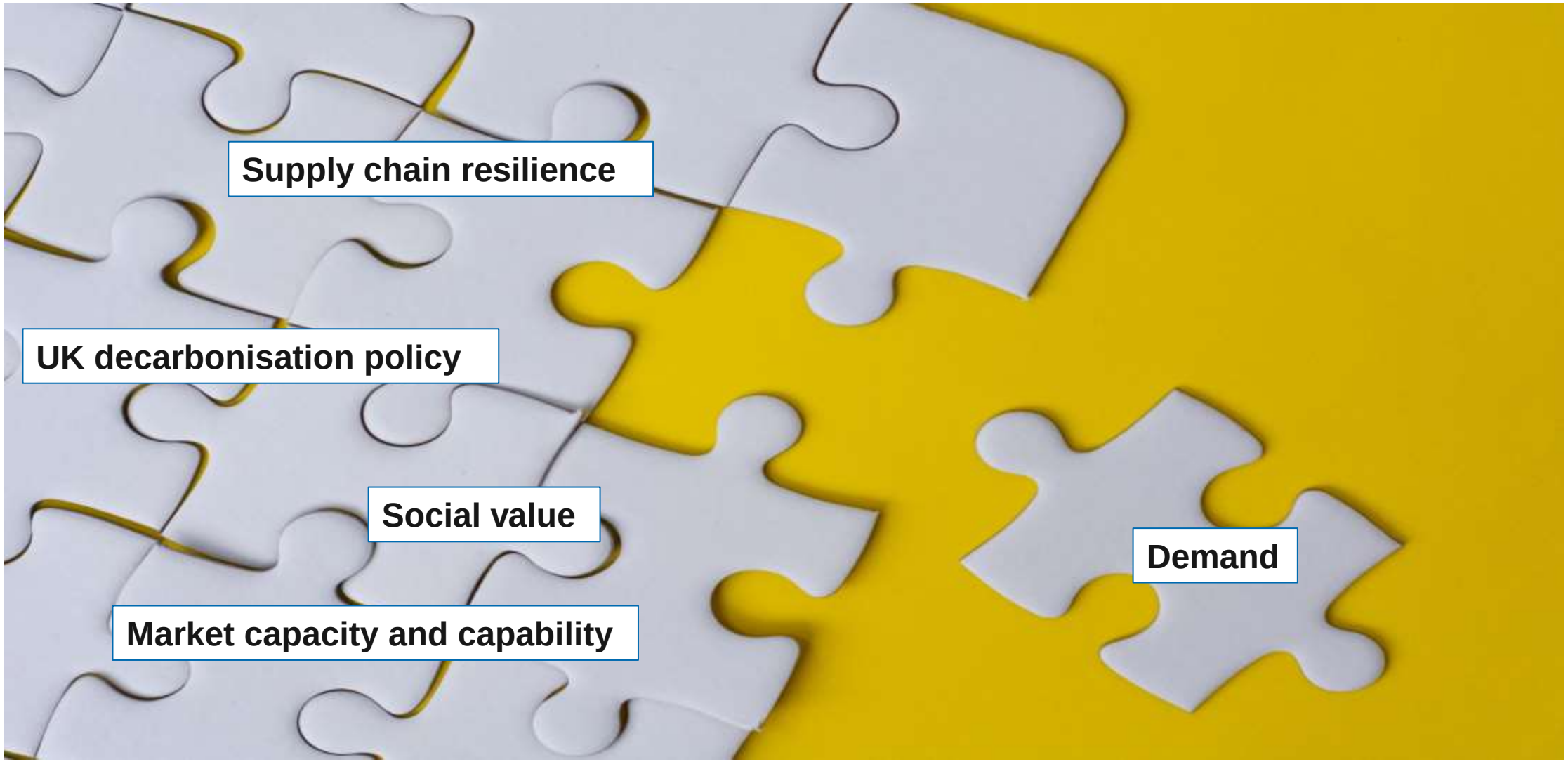
Requirements:

- Value for money
- Reduced carbon & improved biodiversity.
- Improved Social Value
- Eradication of Modern Slavery
- Innovation

Levers:

- Market Development - pipeline visibility and certainty, consistent & unambiguous policy, standards, KPIs.
- Procurement approaches – flow down of requirements, out-put based requirements, aggregated demand, forward purchase.
- R&D and Innovation enablers.

Sourcing considerations



PPN 04/23 Procuring Steel in Government Contracts


Guidance

PPN 04/23: Procuring Steel in Government Contracts

This Procurement Policy Note (PPN) provides updated guidance on how to create a level playing field for UK steel producers through public procurement.

From: Cabinet Office

Published 11 April 2023


Research and analysis

Steel public procurement 2023

How government departments have applied the steel procurement guidance and the UK government steel requirements for the next 10 years.

From: Department for Business and Trade

Published 6 July 2023

https://www.gov.uk/government/publications/ppn-0423-procuring-steel-in-government-contracts

https://www.gov.uk/government/publications/steel-public-procurement-2023

Stakeholders

Proposal for Sector Engagement

Objectives

1. Improve DfT group's understanding of the UK steel sector's capability, capacity and structural challenges.
2. Improve the steel sector's understanding of DfT's strategic aims, its demand, and supply chain.
3. Identify and work through problems that would benefit from DfT and Steel Sector collaboration.
4. Establish a dynamic relationship between DfT and the steel sector.

Progress to date

Meeting 1: Policy landscape

Government's thinking on policy to support decarbonisation of industry and addressing the risk of carbon leakage.

Meeting 2: DfT's pipeline, priorities and challenges

Network Rail, HS2 and National Highways shared their demand for steel, net zero targets and other challenges.

Meeting 3: UK Sector Capability and Capacity

Updates from UK steel, the British Constructional Steelwork Association and British Association of Reinforcement.

Commitment to 6 monthly forums

Opportunities for collaboration between the Sector and DfT *in development.*

Final thoughts

- Clients and buyers can help build confidence to invest in low carbon production by providing greater transparency of steel demand and procurement opportunities.
- Early engagement is also key to unlock design efficiencies that could reduce carbon through using less steel.
- Contact supplychainmanagement@dft.gov.uk to get involved or discuss.
- Steel Sector capability and capacity, and net-zero presentations from BAR, BCSA and UK Steel included as appendix.

SUPPLY CHAIN SUSTAINABILITY SCHOOL

The Demand for Steel: Infrastructure Projects

Robin Lapish
HS2 Ltd
Supply Chain Lead

Ryan Metson
SCS JV
Procurement Manager
Plant and Materials Lead

HS2 Carbon Strategy

Environment Sustainability Vision (January 2022)

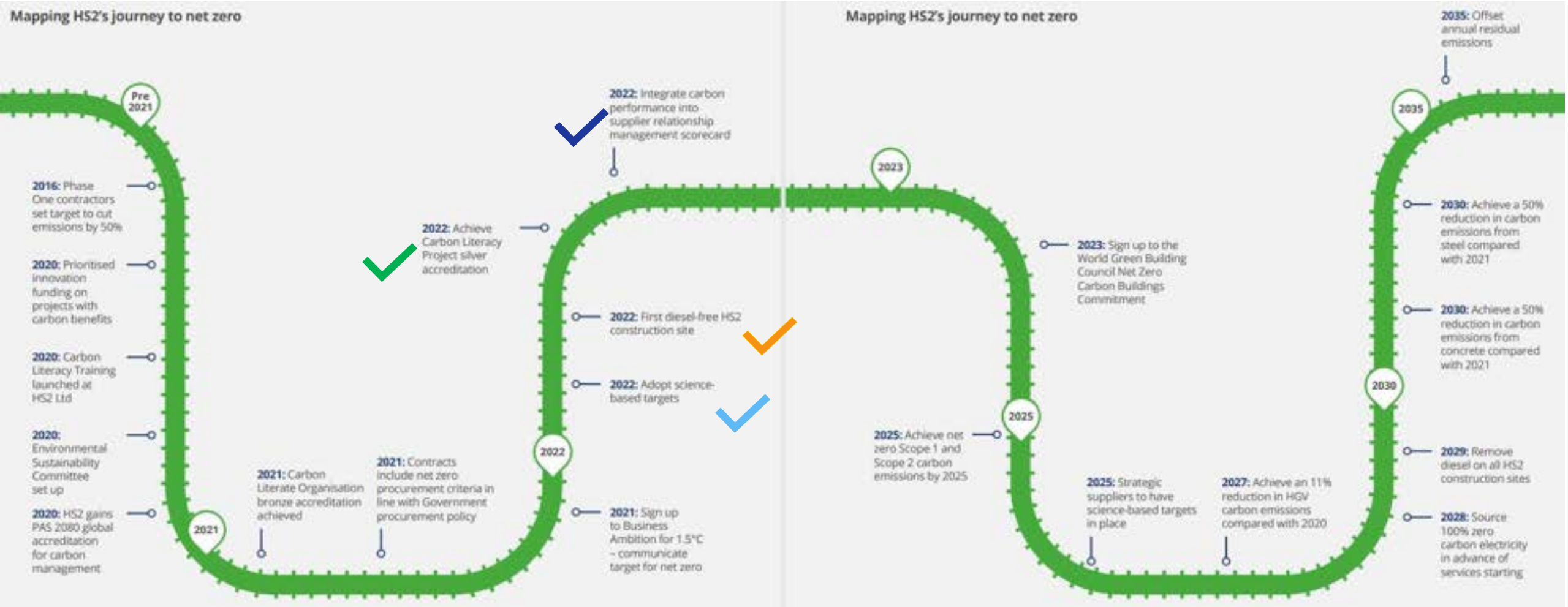
Net Zero Carbon Plan (January 2022)

Net Zero Carbon Construction and Operation

Carbon emissions from construction removed or offset from 2035, by achieving;

- **50% reduction** in whole life carbon emissions by 2030;
- **50% reduction** in emissions from steel and concrete by 2030;
- **First diesel-free** construction site in 2022, and all sites diesel free by 2029.

Targets – Last achievements and future



Update current requirements on bridges and viaducts

Requirements will be updated in order to make the most efficient solutions for bridges and viaducts mandatory as a default solution, in line with best practices in phase 1 and other high-speed railways

Efficiency Challenge Programme

Description: Current requirements within the HS2 Technical Standards provide flexibility for the contractors to develop different designs.
As a result, different proposals are being proposed with different outcomes in in terms of cost, carbon, program, performance and safety.

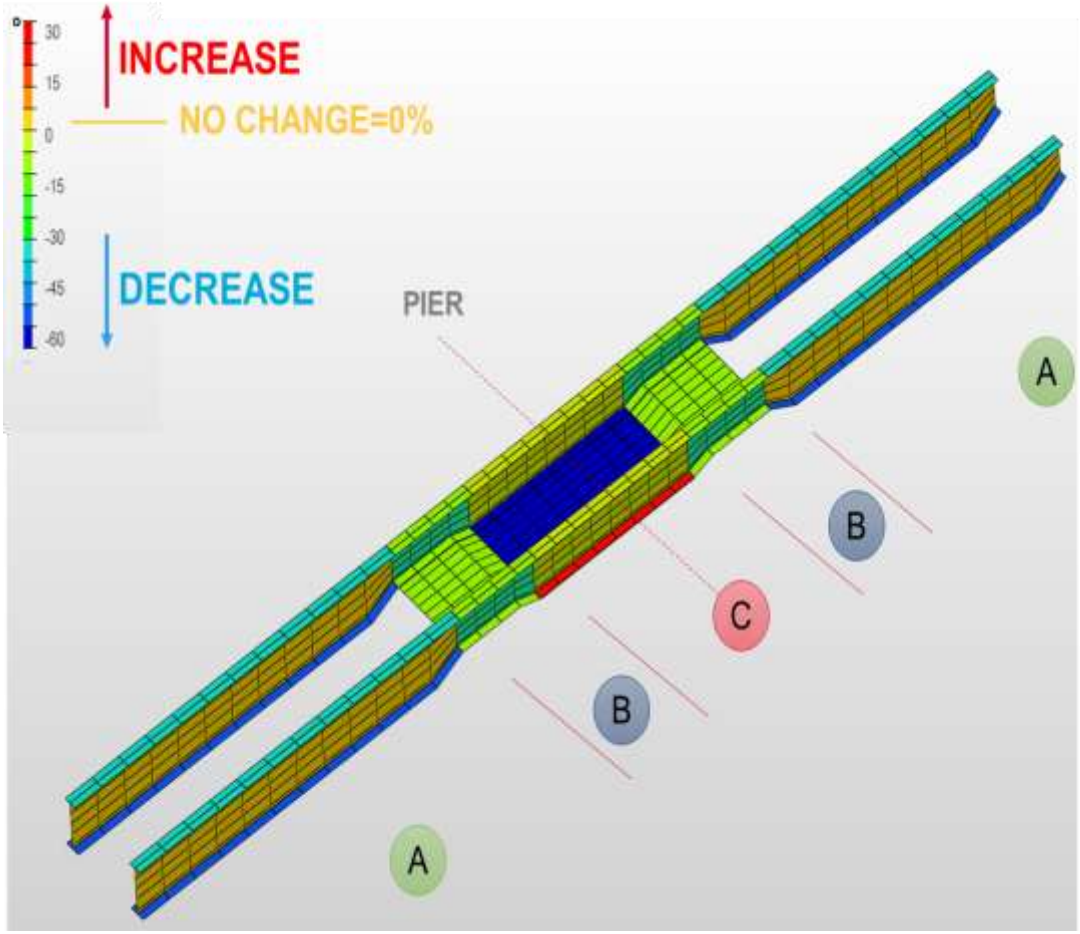
Current HS2 requirements are therefore being reviewed and updated to ensure that the most efficient solutions are implemented as a default solution across Phase 2 in every case, with potential scope for implementation in Phase 1.

Key Benefits: Ensuring requirements are up to date with industry best practice, will reduce the risk of overdesign and the inefficient use of resource, including materials and labour.

Key Deliverable:
New revision of Technical Standards

Software Optimiser at option selection stage

Software development to run hundreds of combinations of the key variables driving bridge design, including foundation impact, typically ignored at option selection stage



Innovation

Description: A piece of software is being developed which will allow individuals to run an optimiser which has the functionality to run hundreds of variables against each other to determine the optimal design for bridges. This model will be able to justify design choices in a transparent and objective way, without being constrained by assumptions based on experience.

Key Deliverables

The initiative will have greater benefit to Phase 2a and 2b of the project

Non-Ferrous Reinforcement: Basalt Fibre Reinforcement

Alternative low carbon solution for temporary works and low criticality assets

Innovation

Description: Basalt Fibre Reinforcement Polymer (BFRP) is a high strength lightweight reinforcement created by combining continuous basalt fibre with resin.

Compared with conventional steel reinforcement:

- Production creates approx. 60% less $CO_{2\ eq}$
- Two times stronger (low modulus)
- Four times lighter
- High resistance to corrosion, alkalis, salts, acids
- Savings on logistics and installation
- Up to 20-60% reduction in concrete cover (design dependent)

Key Deliverables

HS2 are supporting further research BFRP and Low Carbon Concrete as part of their Innovation Strategy and Low Carbon Mandate.

SCS Railways – Key Procurement Strategies

- **15-20% of material-related embodied carbon emissions come from perm. Steel procurement. Our main strategies when procuring steel have been:**
  - **Sourcing recycled steel**
  - **Partner with suppliers practicing low-carbon production**
  - **Prioritise suppliers using cleaner energy sources**

CARES

BES6001

ISO 14001 CERTIFIED

Thank you

Contact the Supply Chain Team
scc@hs2.org.uk

Route to Net Zero

Introducing Our Net Zero Carbon Plan, Technical Solutions Innovation, and Delivery Partner Procurement Strategies

HS2 Supply Chain Management & SCS JV

SUPPLY CHAIN SUSTAINABILITY SCHOOL

The Demand for Steel: Infrastructure Projects

Jane Fox
National Highways
Steel Category Group Lead

Decarbonising Steel

National Highways - Category Management

Jane Fox
September 2023

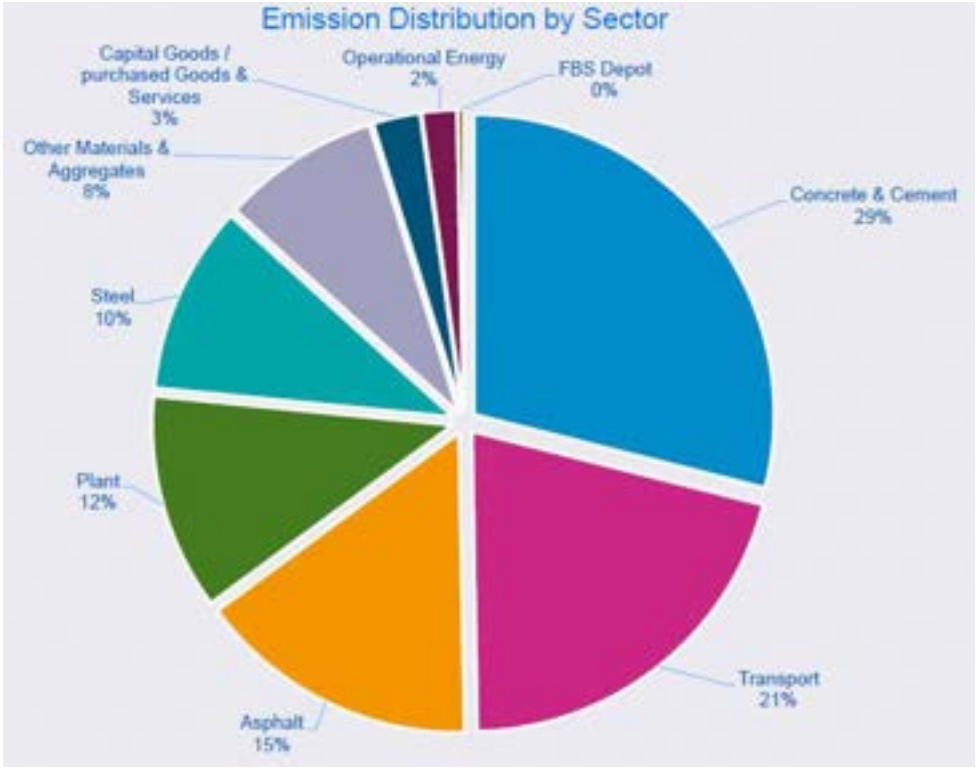
Context

- National Highways don’t use a huge amount of ‘steel’ compared with other Clients – gantries, bridge beams, barrier, piling & rebar, etc.

2022 Annual Report – 527,832 tCO2e

- 87% of this was from 5 key sectors:
  - Concrete & Cement (29%)
  - Transport (21%)
  - Asphalt (15%)
  - Plant (12%)
  - Steel (10%)

The remaining emissions cover a broad range of sectors.

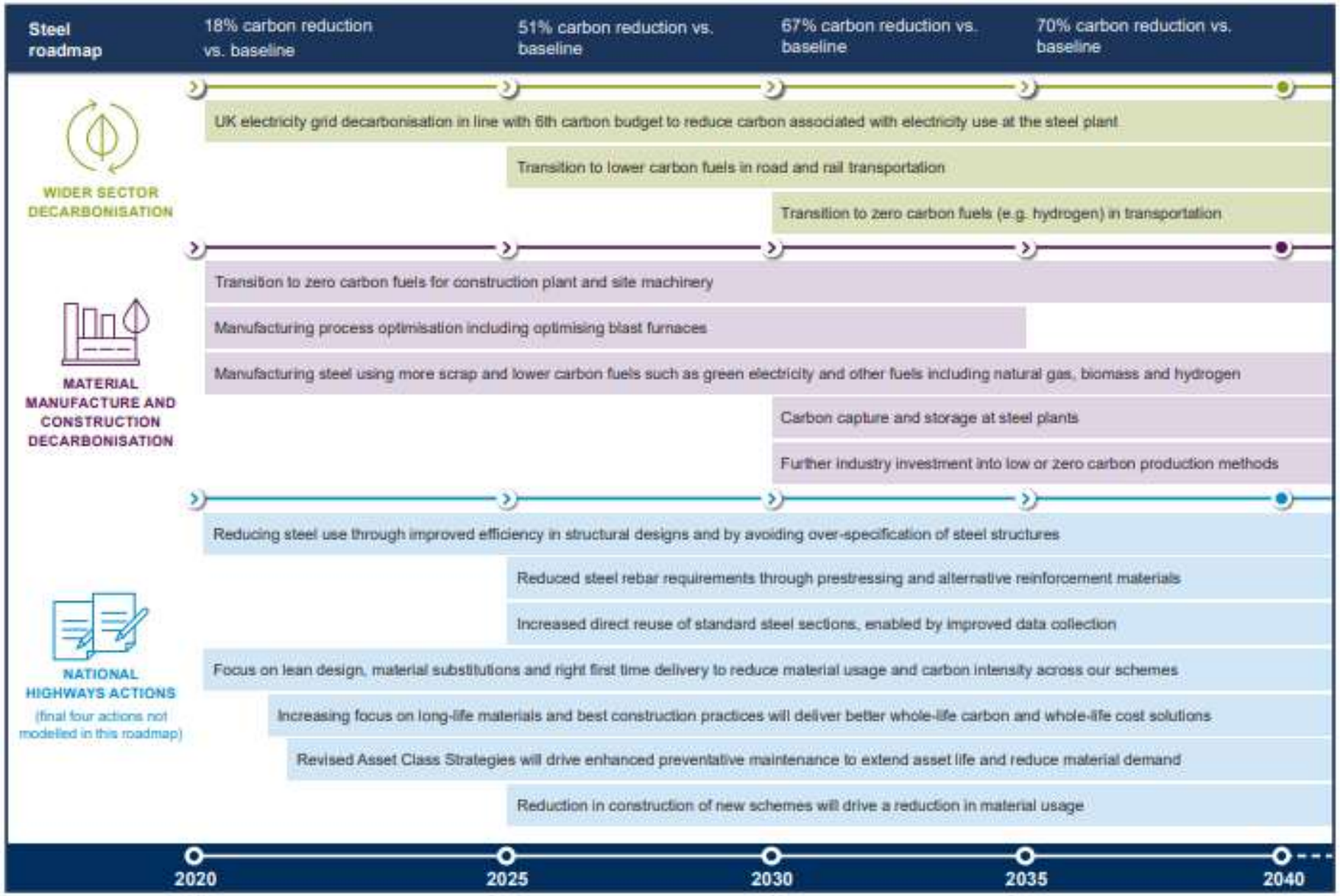


- Target: Net Zero for Maintenance & Construction by 2040

Steel Carbon Roadmap

https://nationalhighways.co.uk/netzerohighways/

https://nationalhighways.co.uk/media/wmcie10p/net-zero-roadmap-for-concrete-steel-and-asphalt.pdf



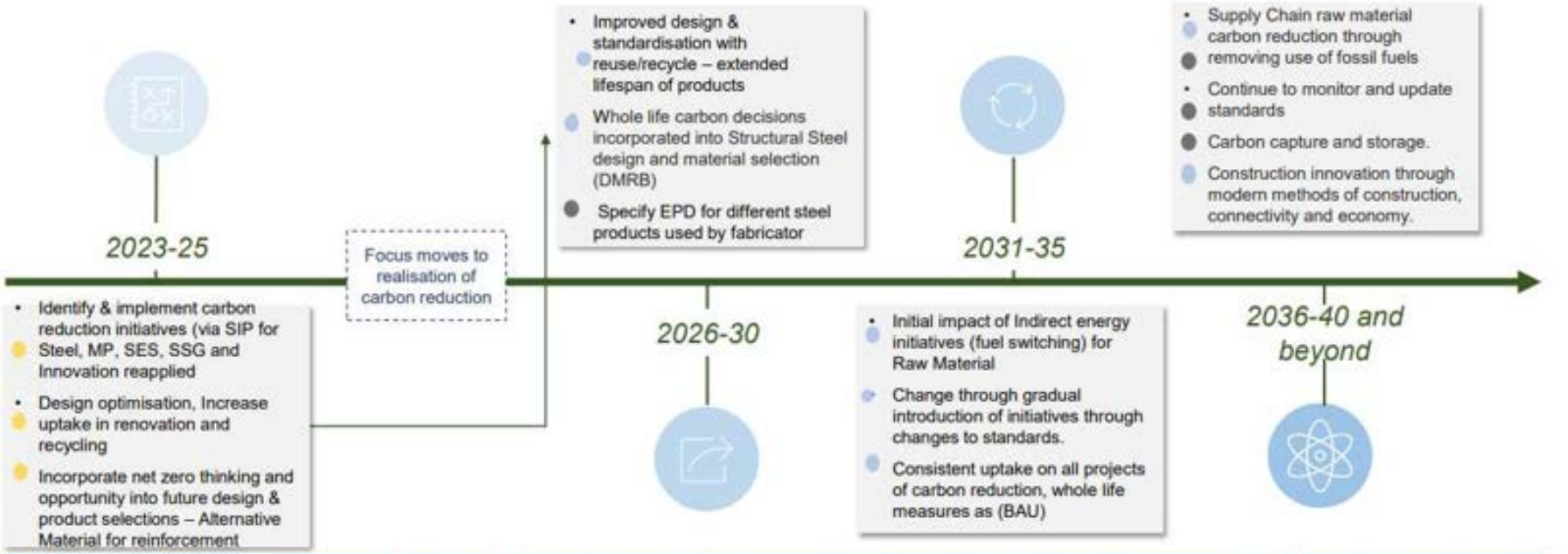
Steel Carbon Plan

https://www.supplychainschool.co.uk/partners/national-highways/

https://www.supplychainschool.co.uk/wp-content/uploads/2023/06/NH-Carbon-Plan-Structural-Steel.pdf

Category: Structural Steel & Gantries

Carbon NetZero Initiatives plan



It is key for National Highways to work closely with the supply chain and wider industry bodies to be able to achieve net zero by 2040. Trialling net zero barrier maintenance and construction schemes on the SRN between 2023-2025. New technologies, fuel changes, a whole life carbon approach to design, delivery and materials will be key to meeting our ambitions.

Legend: Higher Impact · Lower Impact · Unknown Impact

national highways

Steel Carbon Reduction

Our carbon reduction will be driven by **material decarbonisation** and **design optimisation and efficiency**. **Extending asset life** may also reduce demand for new materials.

- Manufacturers switch from Blast-Furnace Basic Oxygen Furnace to Direct Reduced Iron based Electric Arc Furnace
- Use less new steel by increasing direct reuse
- Use less new steel by optimising design
- Manufacturers use hybrid Electric Arc Furnaces for steel plate and section and hydrogen fuels for rebar production
- Emerging technology expected to reduce manufacturing emissions
- Use less steel by using higher strength steel
- Use less steel by updating standards to reduce unnecessary overspecification, where safe to do so
- Carbon Capture and storage at steel manufacturing sites

Carbon Priorities and Challenges

Priorities:

- Carbon Estimating Tool to be piloted from September 2023.
- Further sector discussions that generate achievable milestones to deliver Net Zero construction target by 2040.
- Identifying a programme of schemes suitable for piloting and testing new carbon net zero ideas and solutions.
- Implementation planning & Influencing others

Challenges:

- Meeting our 2040 target for net zero carbon on all construction sites – not only making Steel Industry aware but trying to align differing target dates.
- Agreeing Carbon Roadmap milestones – additional solutions to meet any shortfall
- Accepted use of low carbon products within SES standards & departures – carbon baseline, capture and reporting

NH Groups and Contacts

- **Steel Category Management Community** - Strategic Procurement Division (SPD)
- **Sustainable Supply Chain Group** - Regional Delivery Partnerships (RDP)
- **Structures & Earthworks Implementation Group** - Smart Motorways Alliance (SMA)
- **Steel Productivity Optimisation Group** - Major Projects Innovation Reapplied (MP IR)

NH - Category Group Lead - Steel Structures:

Jane.Fox@nationalhighways.co.uk

mobile: 07706 991 720

SUPPLY CHAIN SUSTAINABILITY SCHOOL

The Demand for Steel: Construction

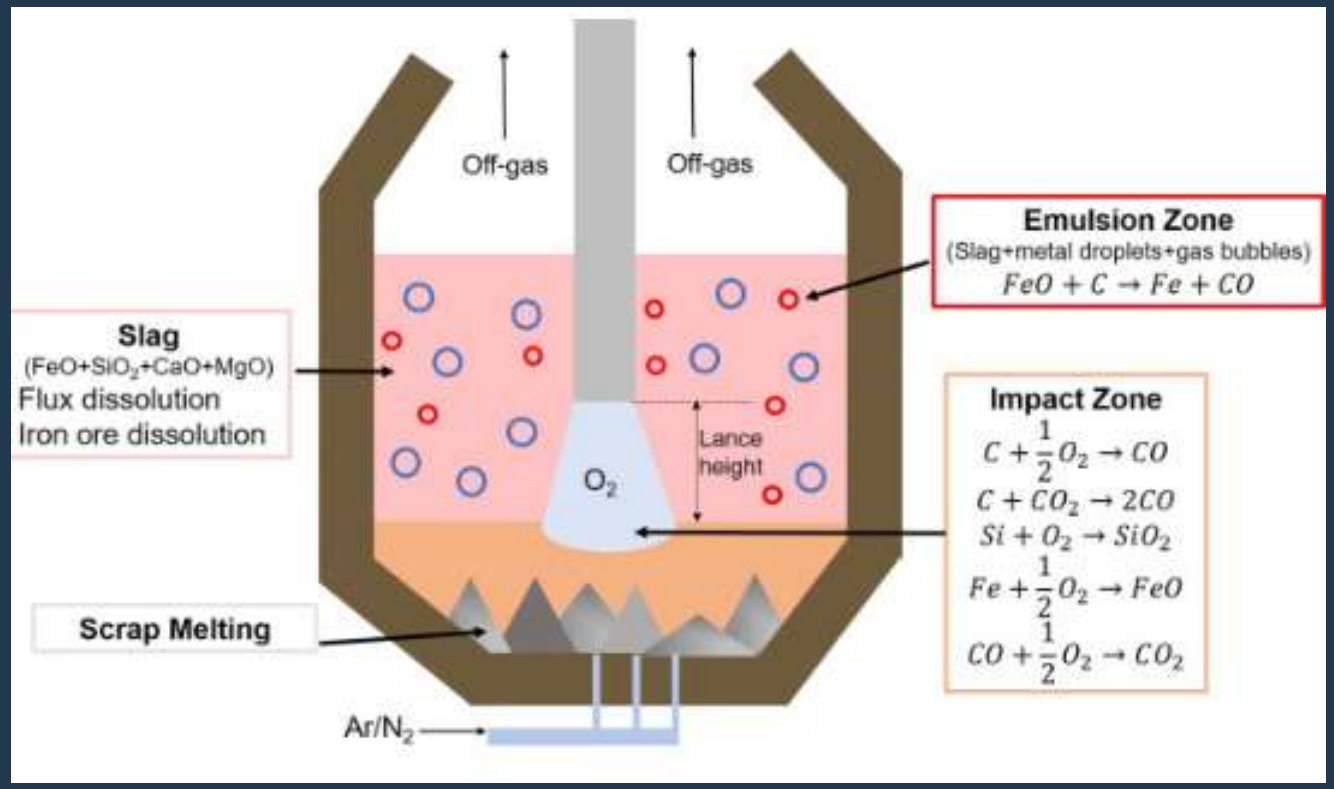
Kye Taylor
Multiplex UK and Europe
Head of Engineering

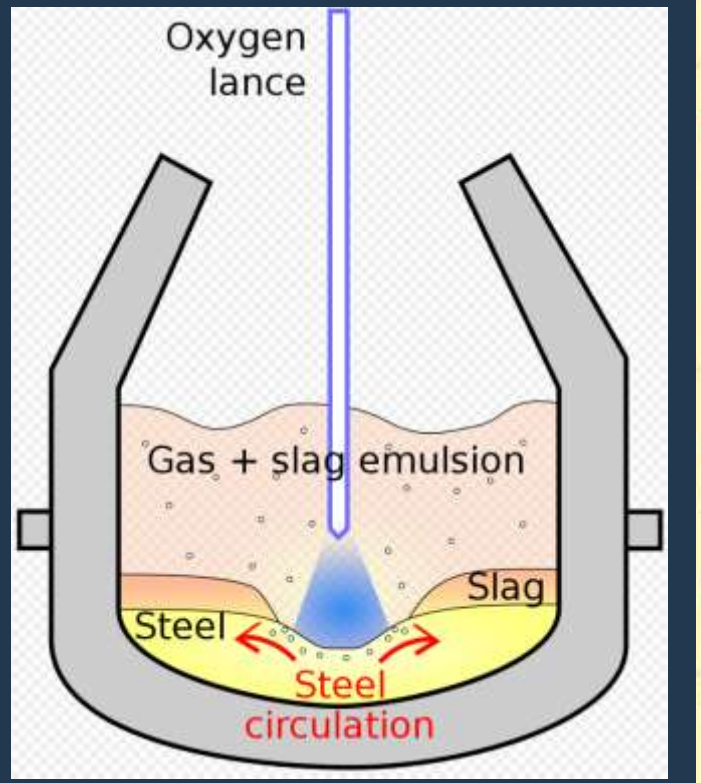
MULTIPLEX

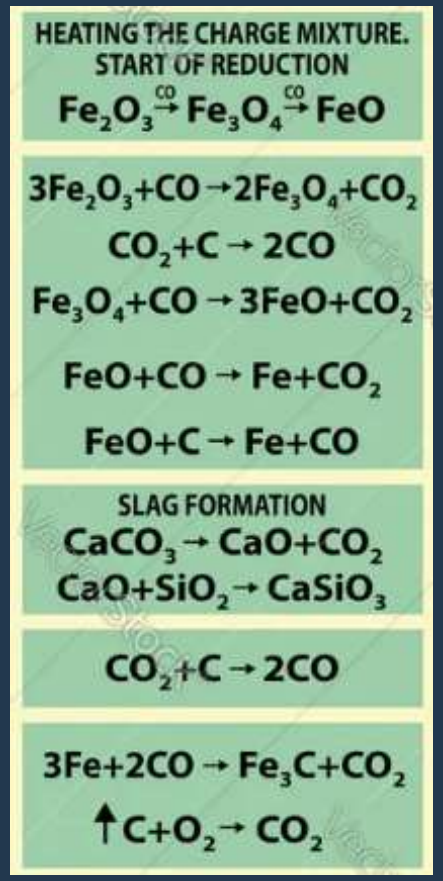
De-Carbonising Steel – Client Demand

21ST SEPTEMBER 2023

Basic Oxygen Furnace (BOF, BOS)

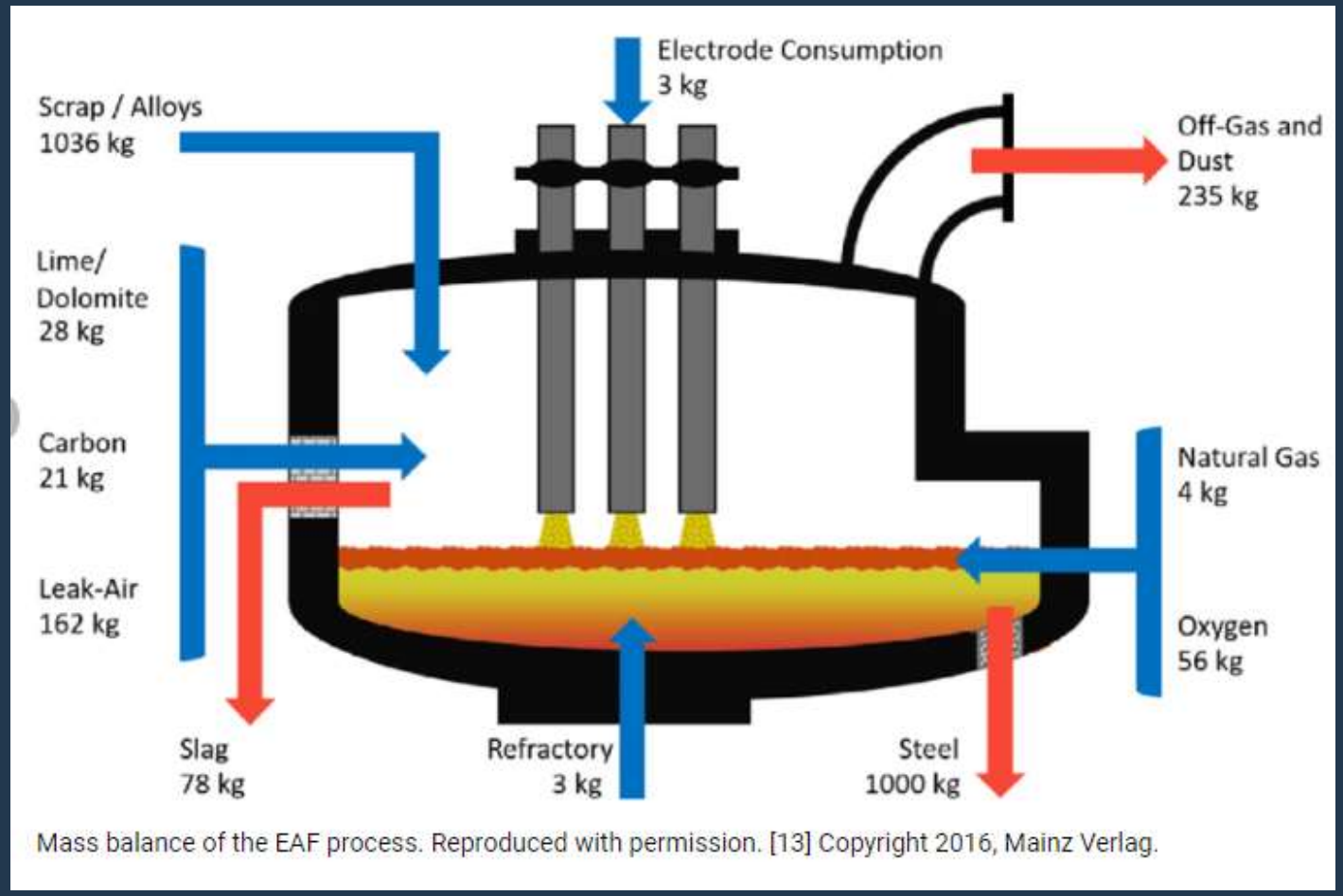






GWP = 2000 - 2500 kgC02e / 1000kg

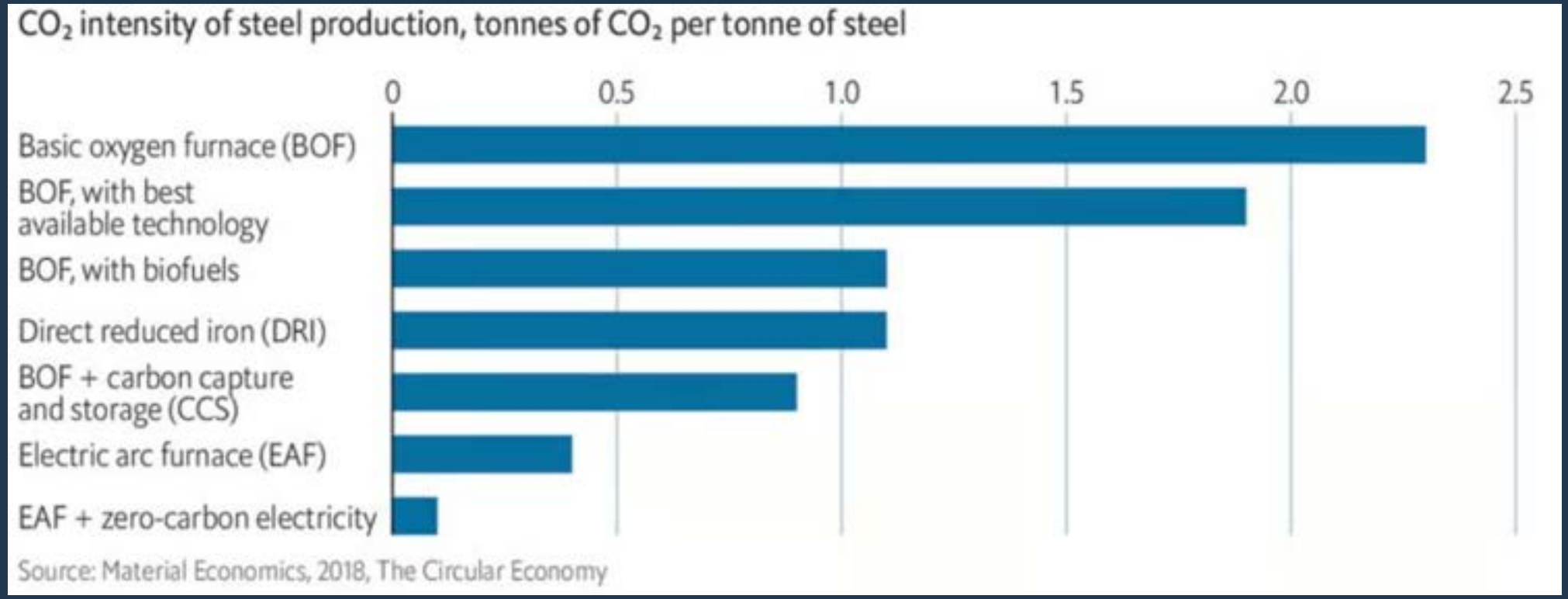
Electric Arc Furnace (EAF)



Mass balance of the EAF process. Reproduced with permission. [13] Copyright 2016, Mainz Verlag.

GWP = 350 - 750 kgC02e / 1000kg

Steel Procurement Options



EAF Coils

Steel Fibres in Suspended decks

ReCycled Aluminium

Low Carbon Concretes

ReUsable Steel

Raised Access Floor ReUse

Area	Option		Carbon δ (kgC02e/m2)	Cost Saving
Steel / Intumescent	1	Fire Engineered Steel Solution	+16	✓
Steel / Intumescent	2	Change in Fire Rating to 75min Above Level 3	Nil	✓
Steel / Intumescent	3	Unprotected Secondary Beams	Nil	✓
Steel / Intumescent	4	Replace External Intumescant with Galvanising	Nil	✓
Steel	5	Increase Column Grade to S460	-14	✓
Steel	6	Reconfigure Edge Beams	-8	✓
Steel	7	Adoption of 80mm Composite Metal Deck	-10	✓
Steel	8	Change Plated Sections to Rolled Sections	-36	✓
Steel	9	Change Plated Sections to ReUsed	-88	Neutral
Steel	10	ReUsable Steel Offering 15-20% ReUsed	-23 to -29	Neutral
Steel	11	ReUsable Steel Staircase	-5	✗
Metal Deck	12	Adopt Magnelis Metal Deck	-22	✗
Concrete	13	Earth Friendly Concrete for settlement Piles	-5	✗
Concrete	14	EcoPact Prime Concrete for slabs	-16	✗
Façade	15	75% Recycled Unitised Aluminium	-12	✗

- Recycle (Great)
  - Crushing concrete to replace new aggregates
  - Recycled glass and Aluminium in façade panels
  - ReSmelt scrap metal to create new Steel products (EAF)

- ReUse (Orders of magnitude more carbon efficient)
  - ReUsable Steel
  - Design for DeConstruction
  - Dry joints instead of wet in Precast
    - Bolted instead of welded Connections

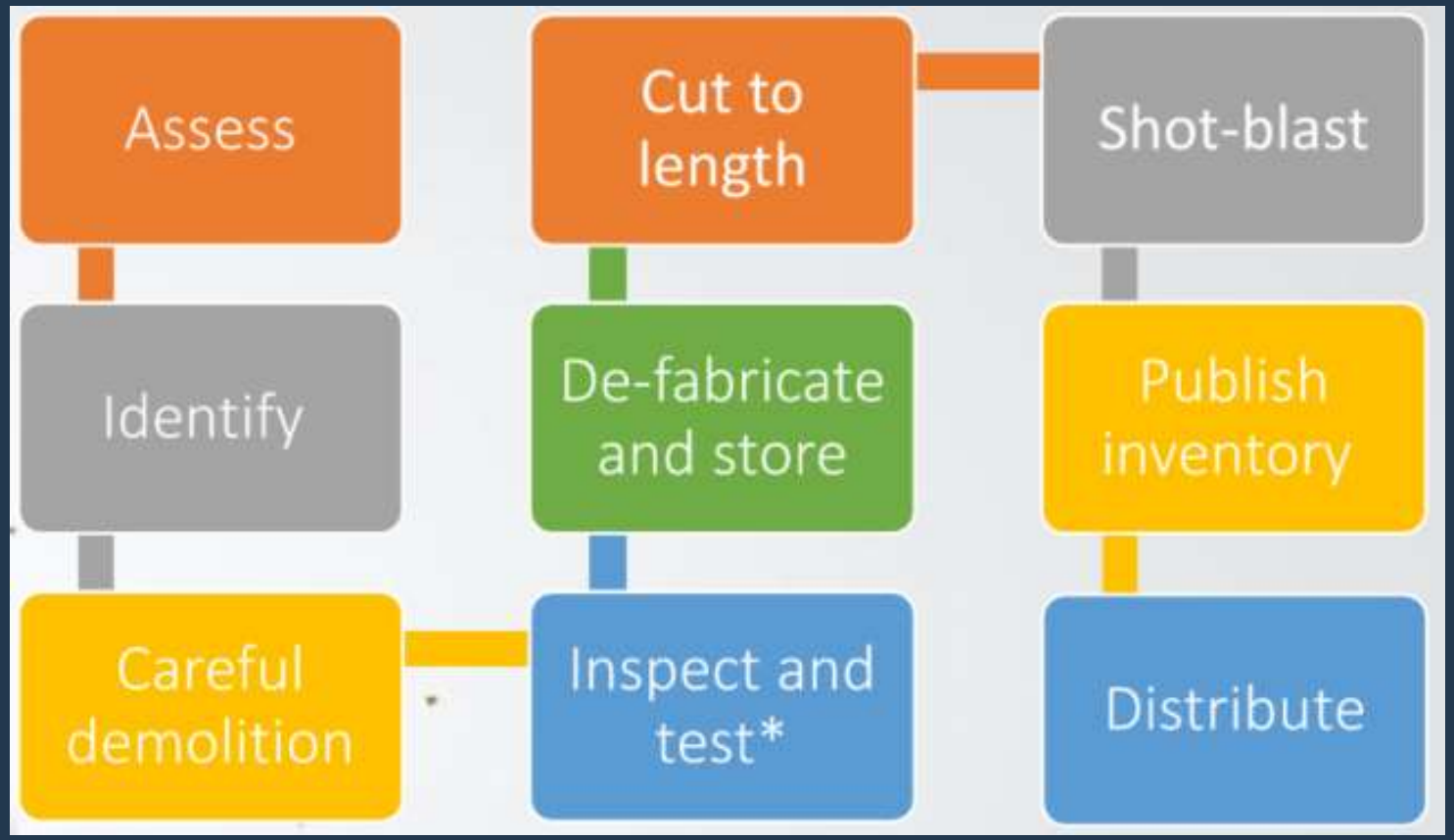
- Basic Oxygen Furnace Primary Steelmaking (BOS / BOF)
  - 2500kg C02e / Tonne of Steel – Prioritize raw materials

- Electric Arc Furnace Steelmaking (EAF)
  - 350-500kg C02e / Tonne of Steel –
  - Prioritize Recycling Steel

- ReUsable Steel
  - 40-60kg C02e / Tonne of Steel

- SCI Structural Steel ReUse P427

- IStructE Climate Emergency Steel ReUse publication



This Environmental Product Declaration confirms that our Reusable Steel products have a Global Warming Potential of 47 kg CO_2-e/tonne.

- Material Passport
- Member Identification
- (Class A) – Post 2003 CE marked – Post 1970 – Building Use Known

EMR Reusable Steel Passport

23A01-AB69

UC 305x305x283

Gaea

Original Member | Defabrication & Notes

Originating Project Information

Project Name	23A01
Reusable Steel Depot	YKIN
Year of Construction	1997
Building Use	Commercial

Original Member Information

Date received	2023-01-31
Date of first load	2023-01-30
EMR Ticket Ref	33333
Likely Orginal Structutral Use	Column
Orginal Length (L1) mm	7000.0
Section Indentification	UC 305x305x283
Gross Weight (t)	300.0

Visual Inspection

signs of gross damage	No

Grouping & In-situ testing

Group Reference	23A01
Vickers Hardness test result	172
Determind Steel Grade	S275
Nos. of Samples Taken from Group	1

Destructive Test Results

Sample	1	2	3
Member ID	n/a	n/a	n/a
Hardness(Hv)			
Tensile Yield (Mpa)			
Tested Ultimate(Mpa)			
Elongation (%)			
Impact Toughness Ave (J)			
Determined Steel Grade			
CEV			

Geometric Inspection (mm)

Dimension	As-Measured	Nominal	Variance
h	610.0	365.3	40.11%
b	325.0	322.2	-40.7%
tw	20.0	75.0	61.71%
tf	60.0	44.1	51.0%

Is the profile within tolerance? No

Pre-Existing Fabrication

Shear studs	No
Web stiffeners	No
Bolt holes	No
Web Penetractions	No
Other Fabricated Items	No

De - Fabrication

Classification	A
Useable Length (L2) mm	6700.0

EMR Member Classification

A	Shotblasted with no holes or stiffeners'
B	Shotblasted with bolt holes
C	Shotblasted with existing & surveyed web stiffeners
D	Un-shotblasted with irregular & surveyed structural penetrations
E	Un-shotblasted with irregular & surveyed fabricated items
F	Repurpose

Notes

1) This passport follows and should be read in conjunction with the assessment, testing and design principles set-out in the SCI P427 (2019) Structural Steel Reuse document

2) The destructive test results do not necessarily relate to a sample taken from this specific Member, but rather the testing group it was part of.

3) The making good of web penetrations involves the introduction of infill plate of the same grade and a minimum thickness equal to web thickness, with a FPBW all-round.

4) This passport should be read in conjunction with the EMR terms of sale.

5) This member is compliant with the EMR Re-Usable Steel EPD

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SUPPLY CHAIN SUSTAINABILITY SCHOOL

Steel Supply, Solutions and Innovation

Nick Silk
Tata Steel UK
New Business Development Manager (Sustainability)

Eoin Bailey
Celsa Steel UK
UK Innovation Manager

Roy Fishwick
Cleveland Steel & Tubes
Managing Director

Nigel Moss
Bourne Group
Group Development Director

SUPPLY CHAIN SUSTAINABILITY SCHOOL

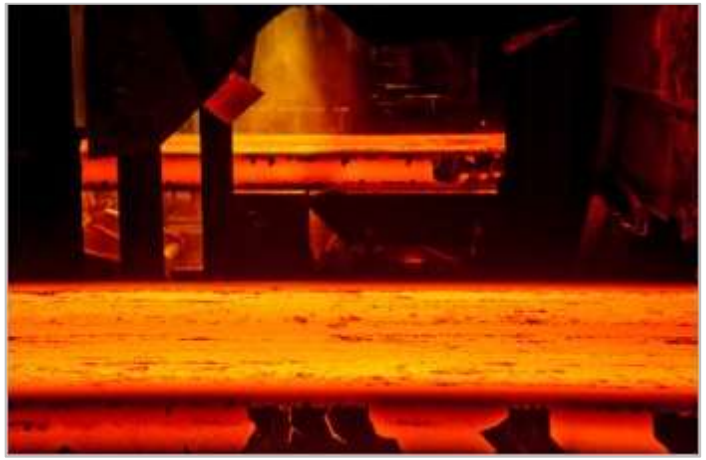
The Demand for Steel: Infrastructure Projects

Nick Silk
Tata Steel UK
New Business Development Manager (Sustainability)

Decarbonisation of strip steels

Dr Nick Silk
Business Development manager – Sustainability
Tata Steel UK

Introduction and context



- Tata Steel UK is fully committed to reducing its impact on the environment
- We have the ambition to produce **net-zero steel by 2045** and to achieve 30% reduction in emissions by 2030

- TSUK is engaged in a wide range of initiatives to decarbonise
- We have launched our innovative **Carbon Lite** solution for short term decarbonisation
- With the support of government we will be able to transform our steelmaking assets

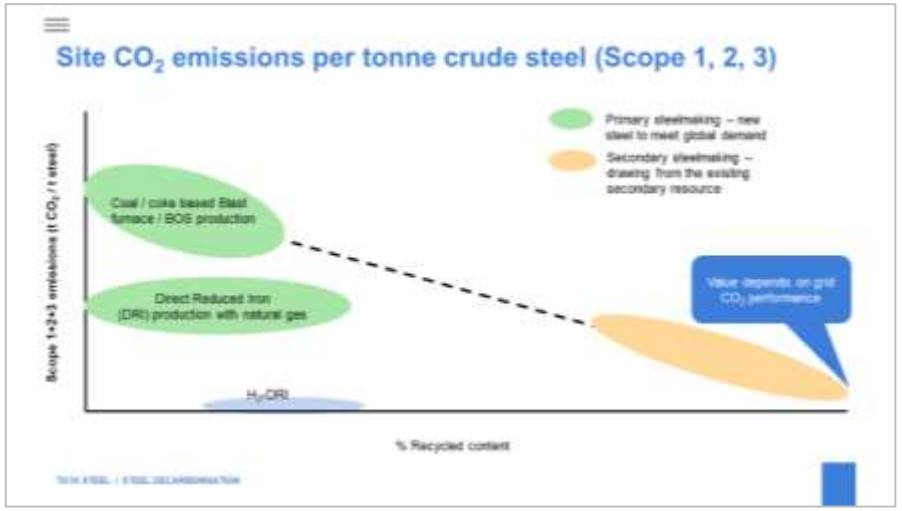
SCIENCE BASED TARGETS

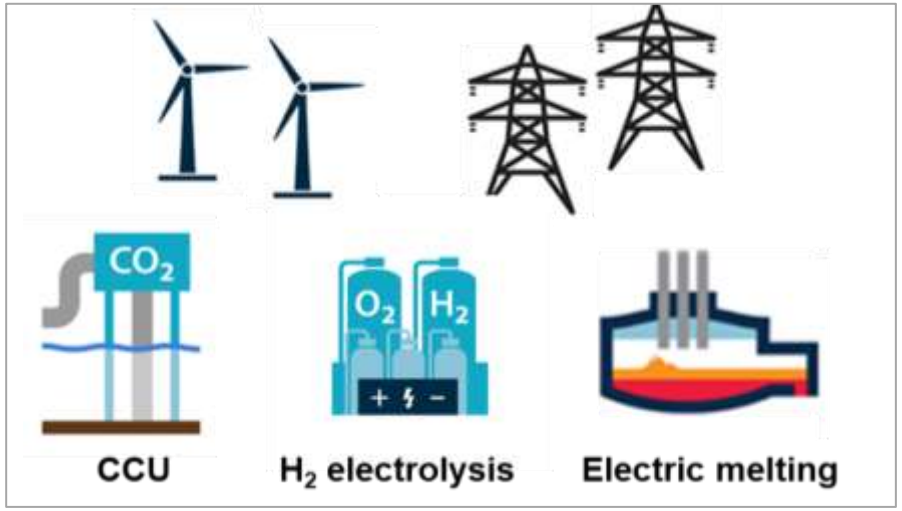
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

- SBTi reviewed the steel sector methodology during 2022/23
- Revised SBTi methodology ‘soft launched’ in the last few days
- Now the methodology is agreed, TSUK is in a position to finalise a pathway and agree targets

Sensitivity: general

Pathways to carbon-neutrality



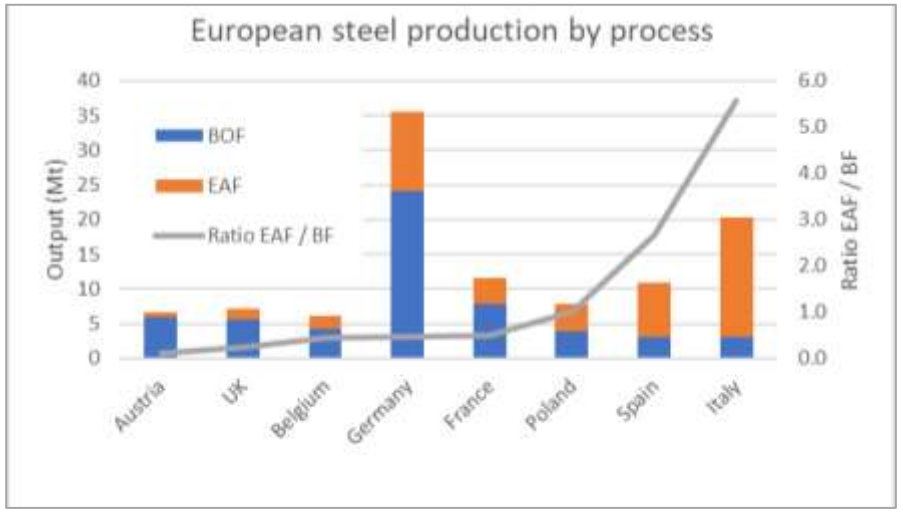


- Steelmaking will always be energy intensive – but it doesn't have to be CO_2-intensive
- A range of decarbonisation options are feasible
- Pathways to decarbonise the steel industry will vary dependent on a range of regional factors

- Electrification is key to decarbonising steel
- Whatever combination of technologies is selected, electricity will be a core requirement
- Secure supply of affordable, green electricity is fundamental for a sustainable UK steel sector

Sensitivity: general

A credible pathway



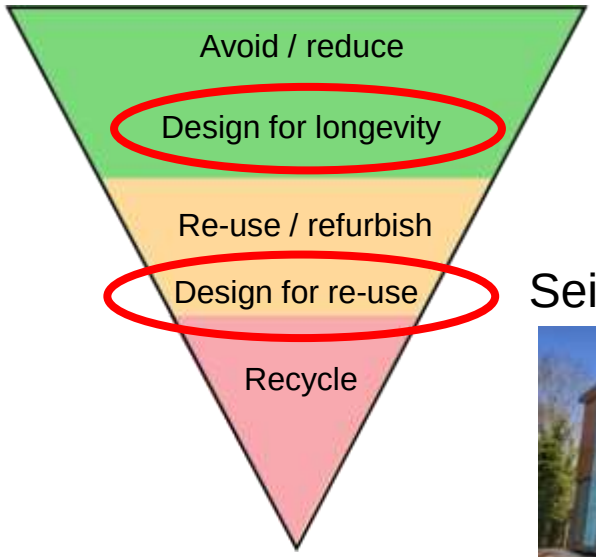
- Tata Steel and the UK Government have jointly agreed on a proposal for the largest investment in the UK Steel Industry for decades
- The proposal lays the decarbonisation pathway towards globally competitive and sustainable steel making in Port Talbot, UK.

- The UK has a relatively low proportion of capacity for scrap recycling compared to EU neighbours
- While still subject to consultation, transition to scrap-based steelmaking is a practical option for strip production in Port Talbot

Sensitivity: general

Circularity supports decarbonisation

Simplified circularity hierarchy



Seismic – modular construction

Modular construction
- minimises waste in manufacture
- demonstrates re-use of components
- whole building can be dismantled and re-constructed in an alternative layout and/or for an alternative purpose

ComFlor®

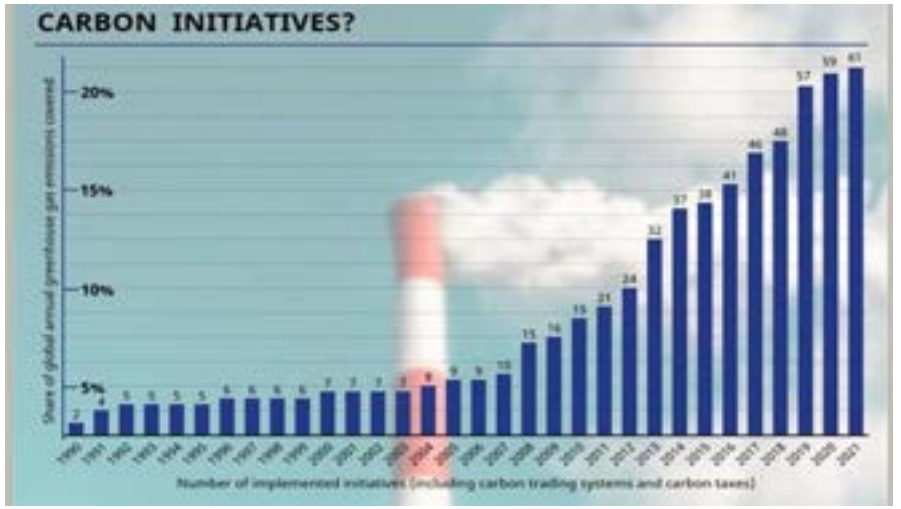
Roofdek®

More sustainable, durable decking and roofing products with Magizinc® for enhanced corrosion resistance

Trimawall® Fast Fit

For speed, safety & reduced environmental impact
- easily demounted for layout adaptability, resilience
- readily re-used to reduce impact of new projects

Necessary interventions for a sustainable UK steel industry



- On average UK steelmakers pay electricity 63% higher prices than those of competitors
- A sustainable UK steel industry, needs energy security plus stable and affordable prices
- Carbon leakage is a substantial risk from the cost of Emissions trading compliance
- Reforms to UK ETS and robust carbon leakage measures are required for a level playing field

The UK steel industry seeks a level playing field on energy and carbon taxation

Sensitivity: general

TATA STEEL

TATA

Thank you for listening

SUPPLY CHAIN SUSTAINABILITY SCHOOL

The Demand for Steel: Infrastructure Projects

Eoin Bailey
Celsa Steel UK
UK Innovation Manager

SUPPLY CHAIN SUSTAINABILITY SCHOOL

Decarbonising Steel: Shaping a Cleaner, Greener Industry

CELSA UK | September 21st, 2023

Eoin Bailey | UK Innovation Manager
eoin.bailey@celsauk.com

CELSA UK | Company Introduction

- Who we are
- What we do
- Where we are
- What we offer
- Over vision
- Q&A

CELSA UK | September, 2023

CELSA GROUP™

6
Business groups

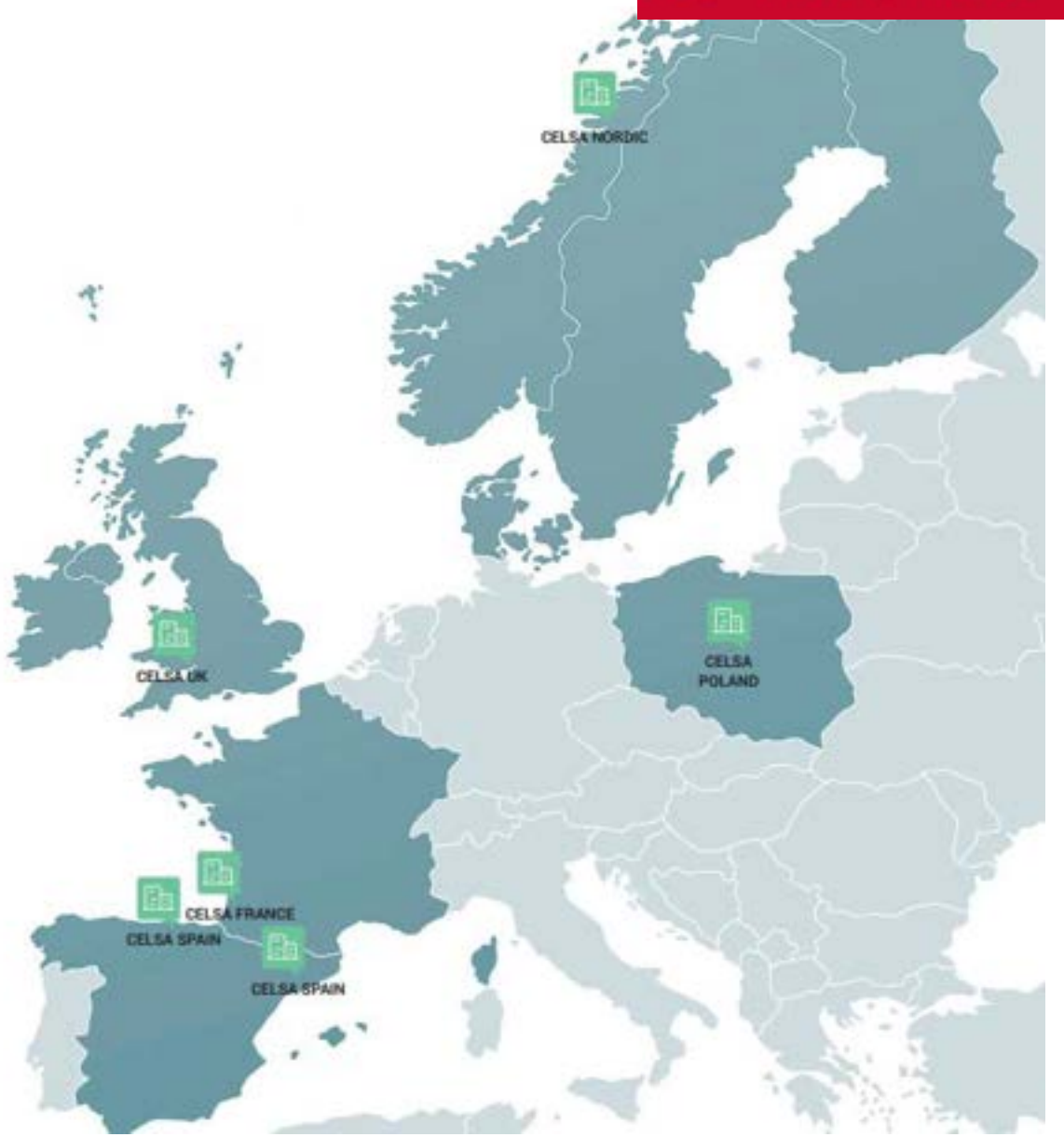
120
Work sites

7
Steel mills

45
Recycling plants

70,000
Professionals

Present in Spain, France, the United Kingdom, Denmark, Finland, Norway, Poland, Sweden and Ireland.



CELSA GROUP | CELSA STEEL UK

CELSA UK | Zero Carbon Ambitions

Largest UK Recycler
1.2 million/T
100% UK sourced scrap

Steel Manufactured
1 million/T Steel produced
98% recycled content

Electric Arc Furnace
Only EAF production
Most resource efficient

Vertically Integrated
Upstream & Downstream
Agile Supply Chain capability

Energy Efficient production
Low Carbon Emissions
Renewable Energy Consumption

Group combined capabilities
7 x EAF across CELSA Group, wide product and service offering

eco REINFORCEMENT

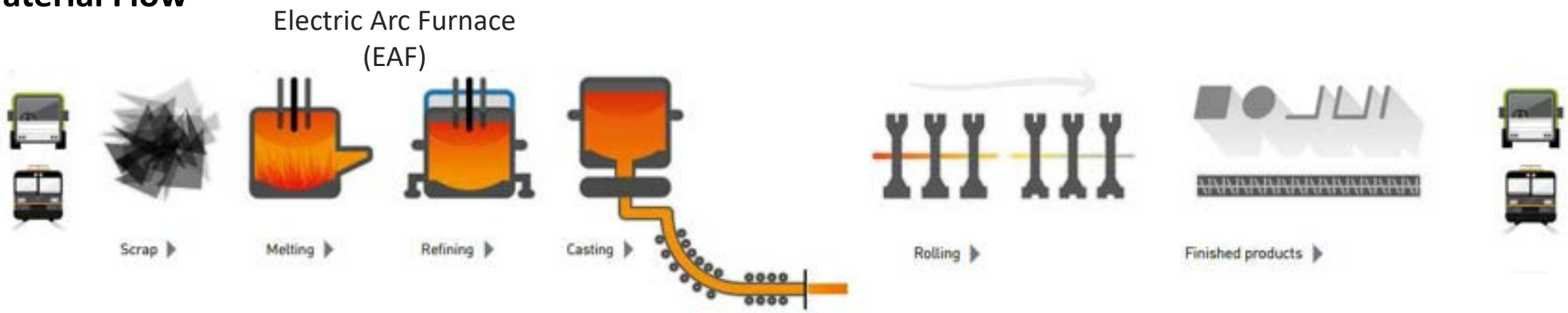
BES 6001 Responsible Sourcing
www.greenbooklive.com

suststeel®

Circular Economy

Material Flow | Manufactured Products

Material Flow



Finished Products

Rod & Bar Mill

Reinforcing bars
For the reinforcement of concrete (Grade 500C)

High Yield Coils
For the reinforcement of concrete (Grade 500C)

Wire Rod
For the production of reinforcing mesh & other applications including wire drawing.

Section Mill

Channels, Parallel, Tapered Flange & UPN
Typically used in composite steel construction.

Plain round bars
With various applications including construction.

Equal & Unequal Angles
Typically used as a structural steel element in construction.

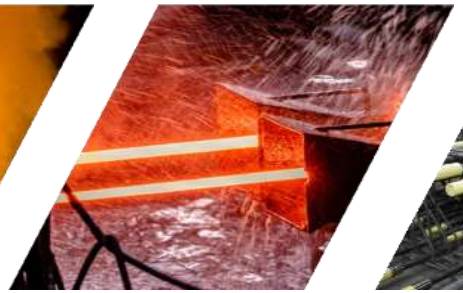
Flat bars
With various applications including construction, transport and machinery.

Locations | Brands

CELSA Manufacturing


Scrap


Melt Shop


Mill


Fabricator

CELSA GROUP™

BRC REINFORCEMENT

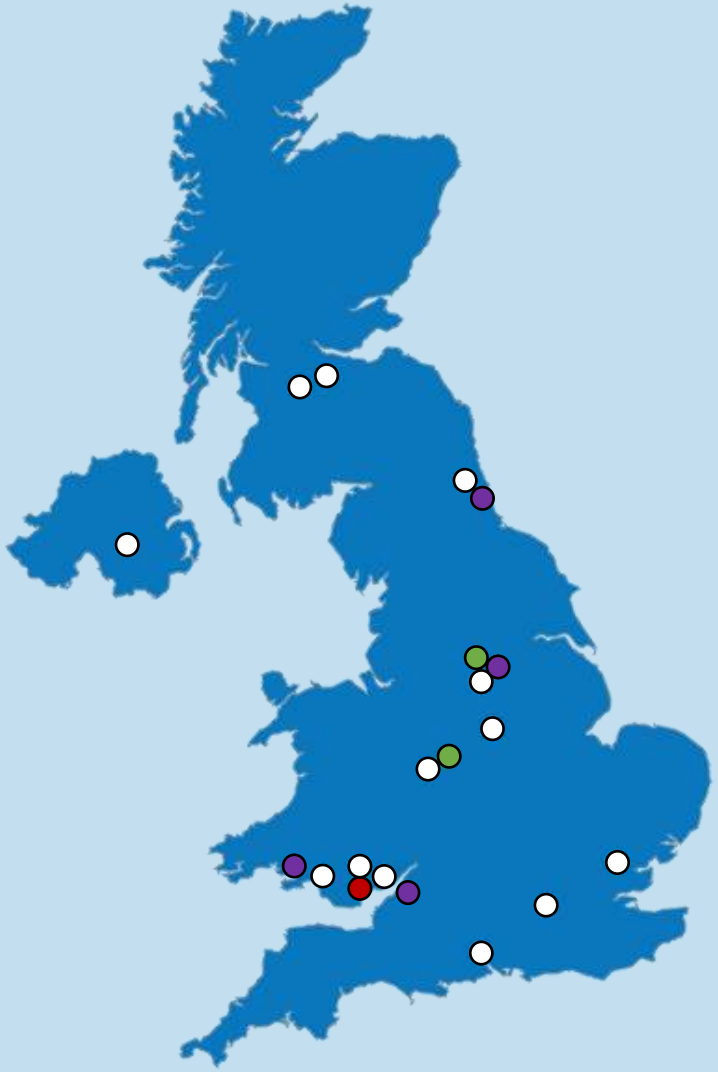
Express Reinforcements Ltd.

ROM

ROMTECH

RFA-TECH

- **Scrap Facility**
- **Head Office, EAF & 2x Mills**
- **Fabricator**
- **Mesh Producer**



CELSA GROUP | CELSA STEEL UK

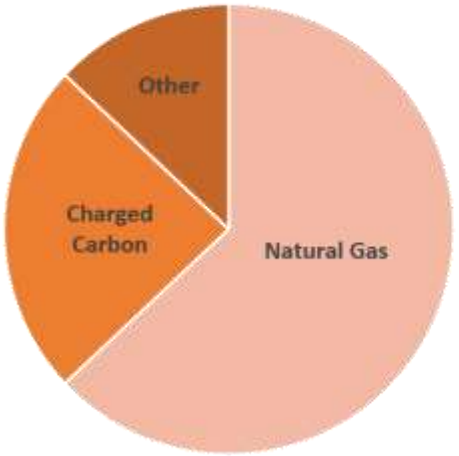
EPD| Low Carbon Option

Kgs CO_2 /T	CELSA UK EAF	European avg EAF	China BOS
Production (inc. energy)	**429***	785	2,200
Transport	+6	+160	+550
Total	435	945	2750

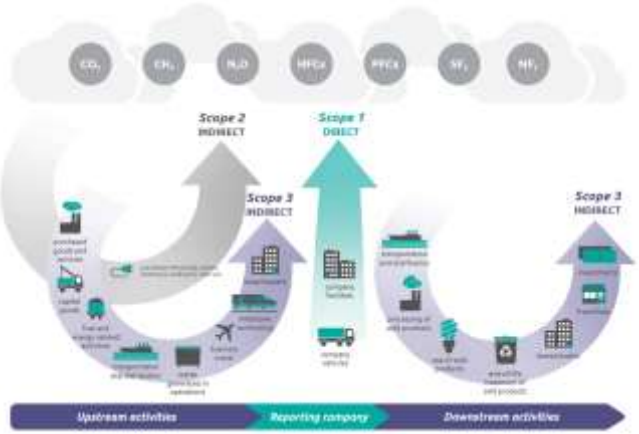
Environmental Product Declaration (EPD)
Lower carbon options are available under REGO (Renewable Energy Guarantees of Origin)
*EPD currently certified – constantly being updated

CELSA UK | Net Zero Pathway

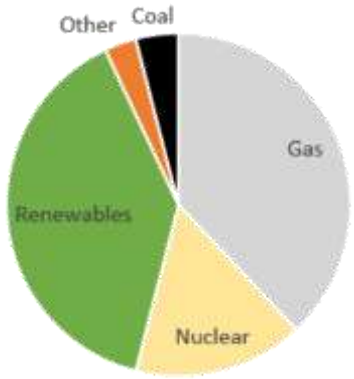
Scope 1



	Process Optimisation	Mid-Term	Long Term
Natural Gas	• Burner Efficiency • Recuperator • Hot Charging	• Feasibility Study *(completed)*	• Conversion to hydrogen (fuel switching)
Charged Carbon	• Optimise Consumption & Efficiency	• Carbon Alternative Materials e.g biochar/e-coke	
Electrodes		• Advances in material use and choice	



Scope 2

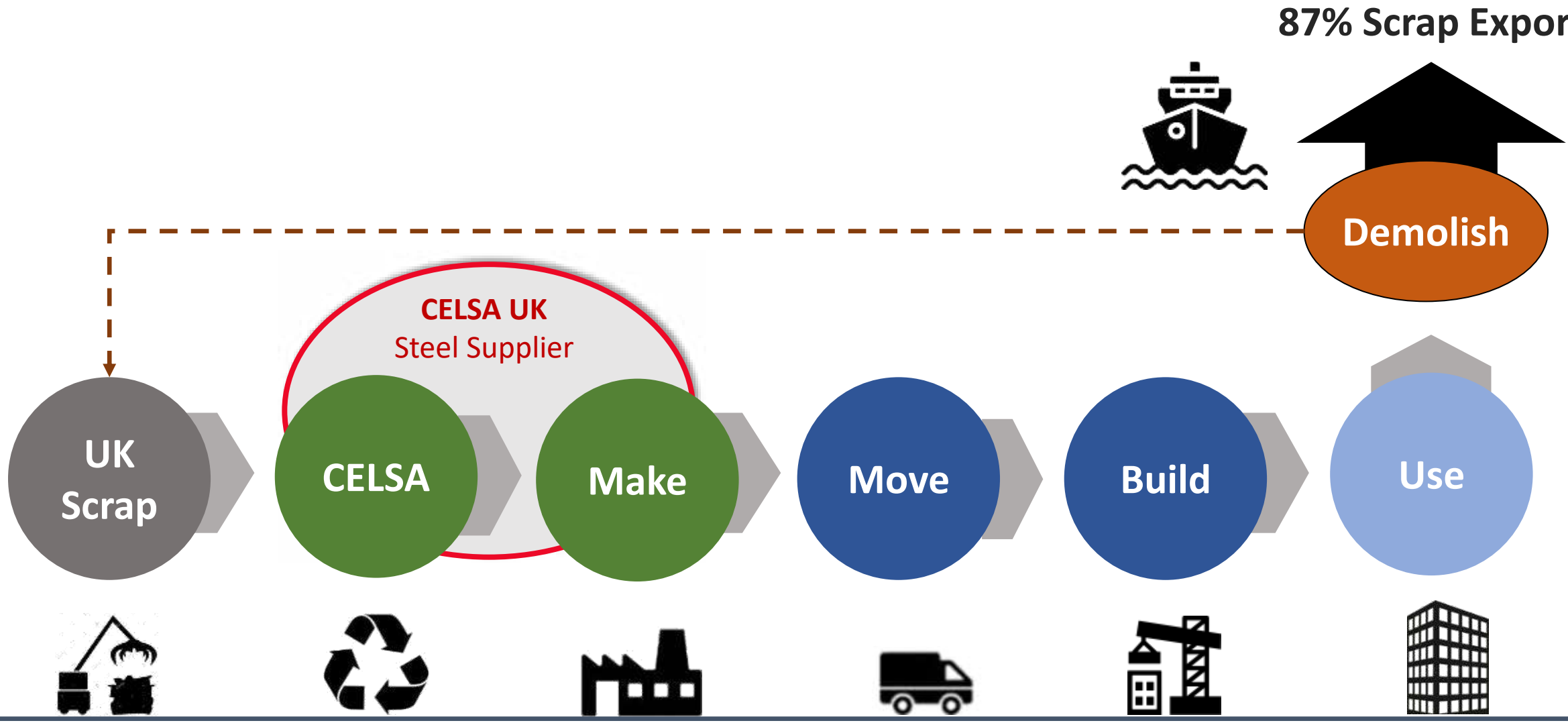


	Short Term	Mid-Term/Long Term
Electricity	• Process Efficiency & Optimisation • Stabilisation of Supply	• Green Energy through PPA & G.O

Scope 3

	Short Term	Mid-Term/Long Term
Supply Chain	• Engagement with Supply Chain • Internal Procurement Review	• Sustainable Procurement Framework (ISO 20400) • Modal Shift • Fuel Switch (Biofuel/EV)

Steel Supplier | Transactional



98% Recycled Steel | Low CO2 | within a Linear Economy

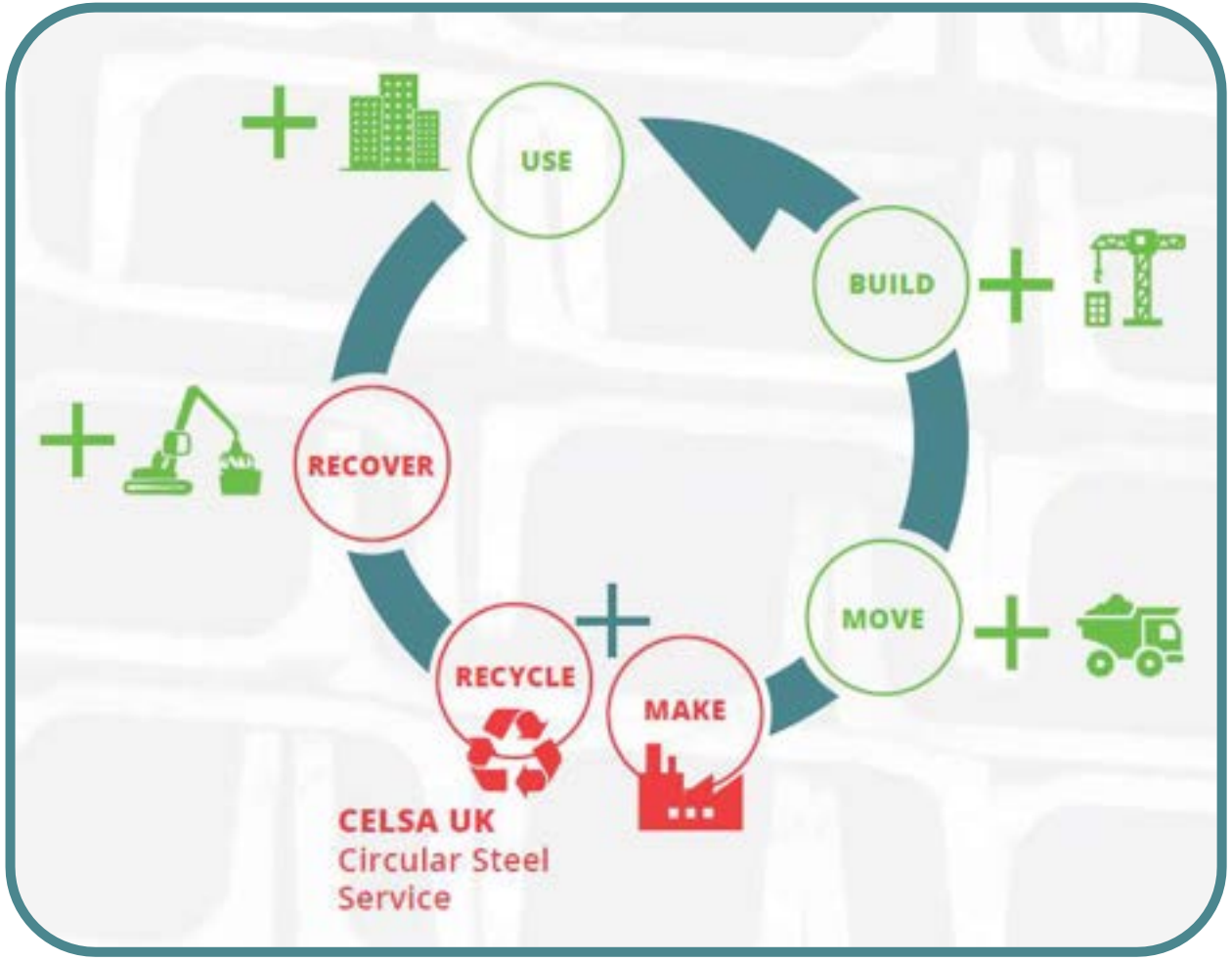
Strategic Partner | Collaborative

Construction Scope 3 Reduction

A platform for collaborative circularity that supports resource efficiency, carbon reduction and supply chain resilience across the built environment.

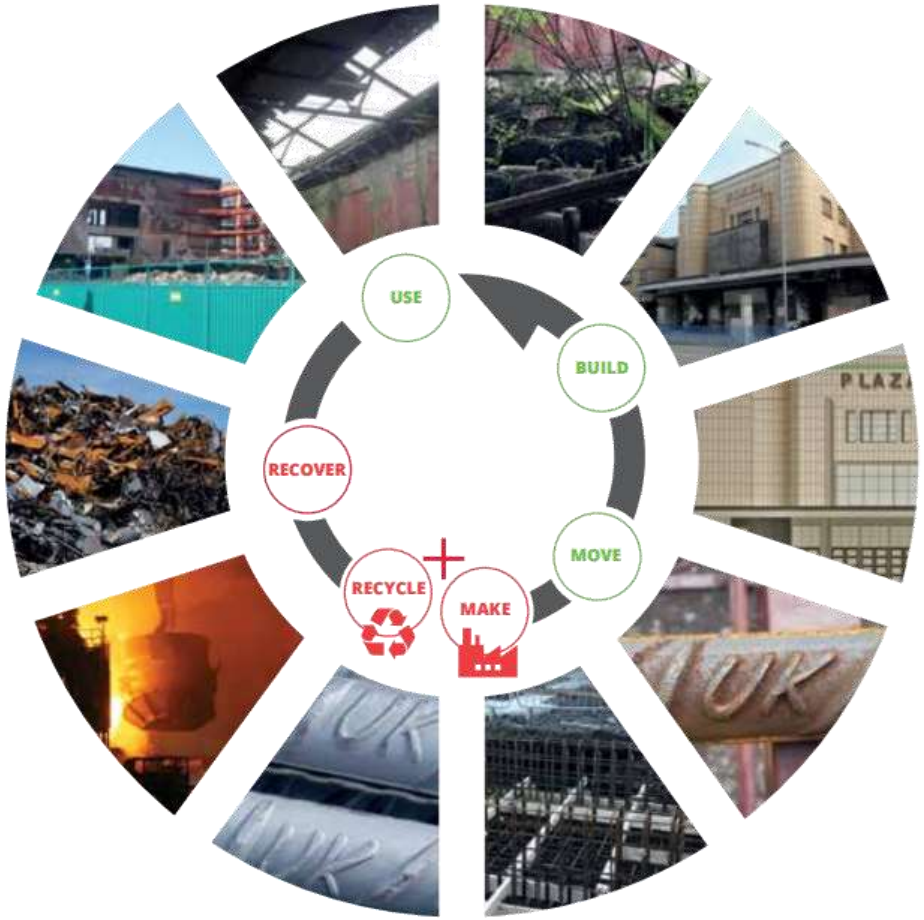
celsa circular steel

Voucher



Added Value | Added Benefit

Plaza Cinema | Pilot Project



Collaboration to build
Trust | Transparency | Shared Vision | Shared Values

Carbon Reduction Benefits based on:

- **25 T scrap recycled**
- **14 T reinforcement steel purchased**

	Kg CO_2 / T
Plaza Scrap Value @1.67 x 25	- 41,750
CELSA UK EPD @0.429 x 14	+ 6,006
Total Pilot Carbon Saving	**- 35,744**

Scrap Recycling Saves:
1,670 kg CO2/T
https://worldsteel.org/climate-action/climate-change-and-the-production-of-iron-and-steel/

Cluster Collaboration | Shared Benefits

SOUTH WALES INDUSTRIAL CLUSTER

CELSA Circular Steel Programme:

- New Product Offerings
- Partnerships
- Certifications
- Investments
- Innovation

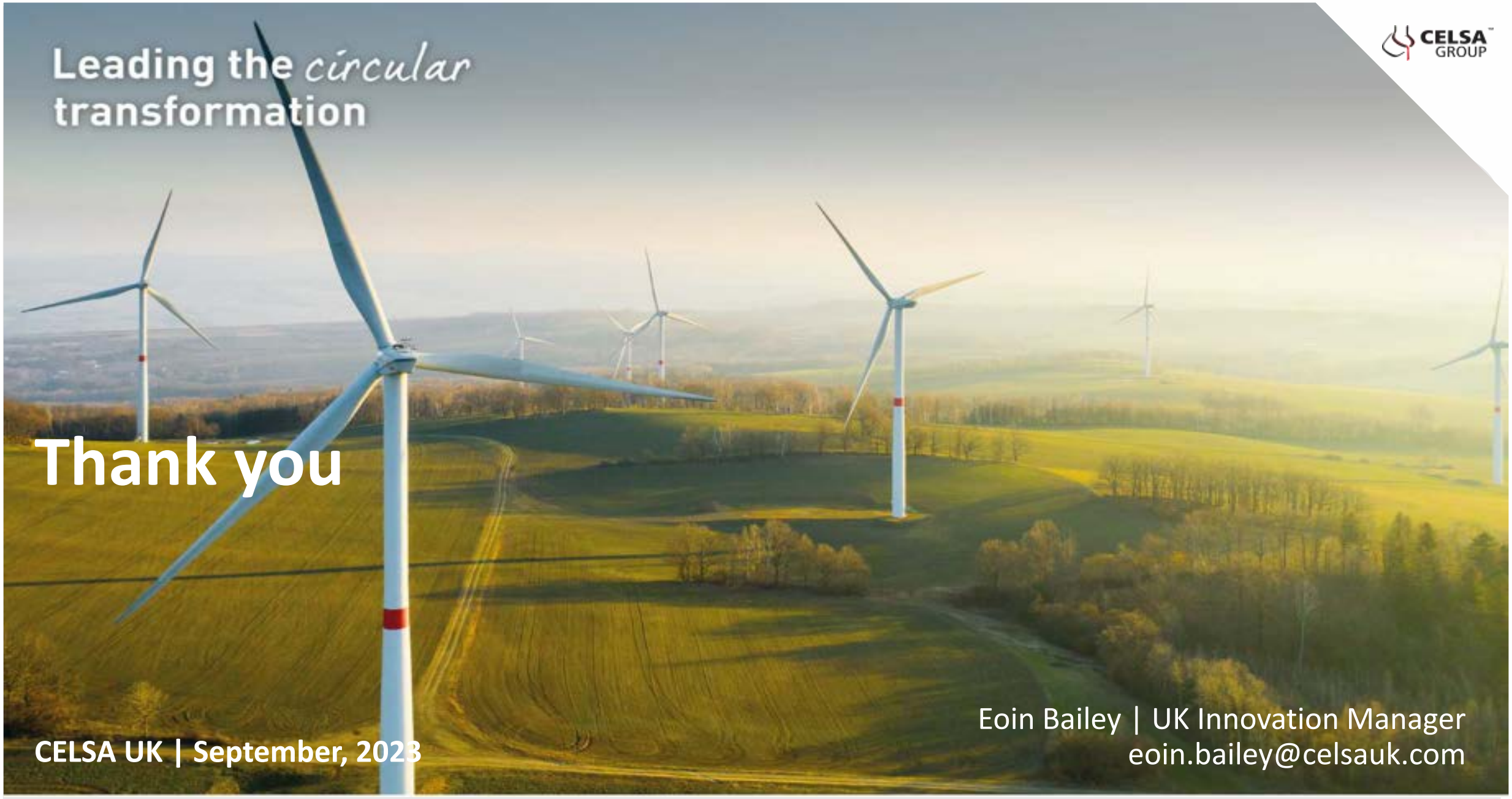
celsa circular steel | CELSA GROUP™

Our
PURPOSE

"We give infinite life to finite resources"

Our
VISION

“To be the leaders of the circular supply chain to build a net positive future"



Thank you

CELSA UK | September, 2023

Eoin Bailey | UK Innovation Manager
eoin.bailey@celsauk.com

SUPPLY CHAIN SUSTAINABILITY SCHOOL

The Demand for Steel: Infrastructure Projects

Roy Fishwick
Cleveland Steel & Tubes
Managing Director

CLEVELAND STEEL & TUBES LTD

Steel Reuse – A Practical View

Cleveland Steel and Tubes – 50 years of repurposing and reusing steel

Managing Director; Roy Fishwick –BSc MBA

30 years experience

What is Reuse?

Second hand material – used in another application

Waste material – saved from waste OR

Prevent Need for New

Byproduct – material created but not required when new product manufatured

Legally

Can we reuse?

Piling – Eurocode pt5 specifically allows

For reuse

CE Marking 1090-1/1090-2 –

not specific but “allows” for reuse

- “products from non-harmonised standards” section 5.3
- specification is key – if specify S355 it must be made to harmonised standard
- if made since 2012 must be CE marked, older material NO
- properties must be specified/proven

3 Material properties

3.1 General

(1)P This Part 5 of EN 1993 shall be used for the design of piles and retaining walls fabricated from steel conforming with the standards referred to in 3.2 to 3.9.

(2) This document may also be used for other structural steels, provided that adequate data exist to justify application of the relevant design and fabrication rules. Test procedures and test evaluation should conform with section 2 of EN 1993-1-1 and EN 1990 and the test requirements should align with those given in the relevant standards mentioned in 3.2 to 3.9.

(3)P Re-used and second quality piles shall as a minimum comply with the requirements concerning geometrical and material properties specified in the design and shall be free from damage and deleterious matters that would affect strength and durability.

5 Constituent products

5.1 General

Generally constituent products to be used for the execution of steel structures shall be selected from the relevant European Standards listed in the following clauses. If constituent products that are not covered by the standards listed are to be used, their properties shall be specified.

Definitions and requirements of EN 10021 shall apply together with those of the relevant European product standard.

5.2 Identification, inspection documents and traceability

The properties of supplied constituent products shall be documented in a way that enables them to be compared to the specified properties. Their conformity with the relevant product standard shall be checked in accordance with 12.2.

For metallic products, the inspection documents according to EN 10204 shall be as listed in Table 1.

Can we reuse?

CE Marking

Steel from pre 2012 does not require CE marking nor do components if you do not change their physical properties

Steel work “placed on the market” requires CE marking – if not it doesn’t

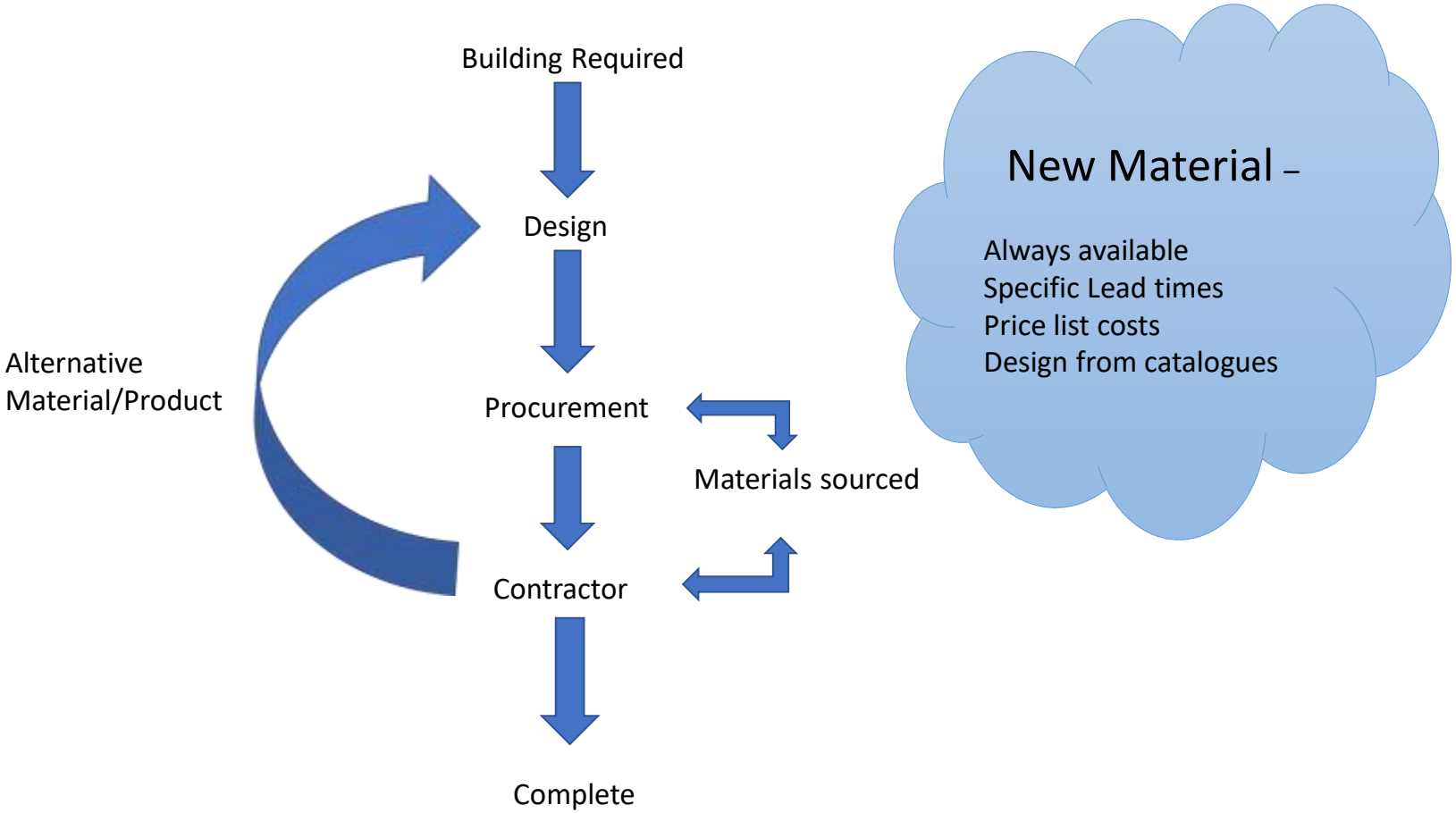
Steel specified to harmonised standards must be 3.1 certified AND meet the requirements of that standard

SPECIFICATION IS KEY - SPECIFY GRADE OR EQUIVALENT

SPECIFY DENTS/DINGS/HOLES ETC

Business Models

Traditional Model



Design

(some reuse is better than none)

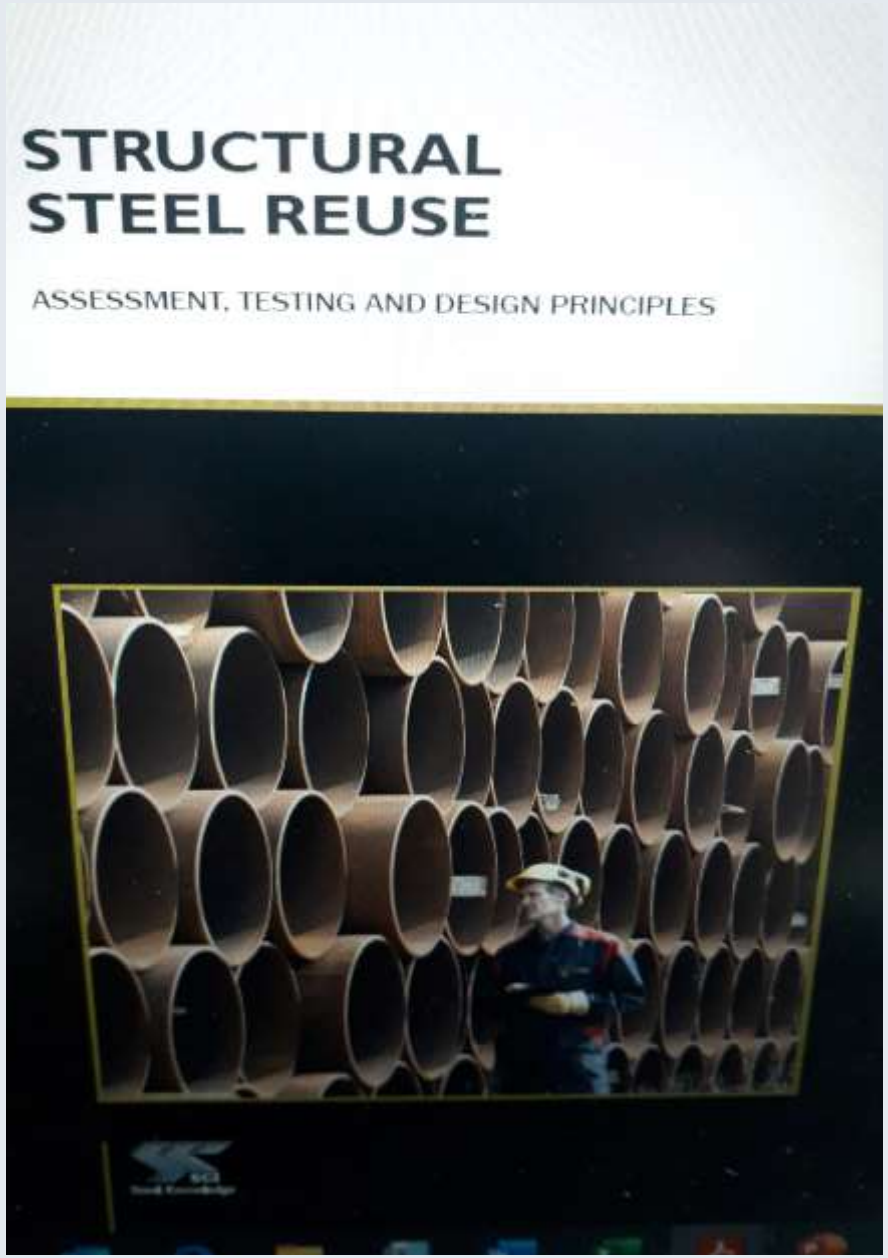
Literature available to assist

Steel Reuse Protocol

NSSS annex J

P427 steel & P440

Model Specification for purchasing

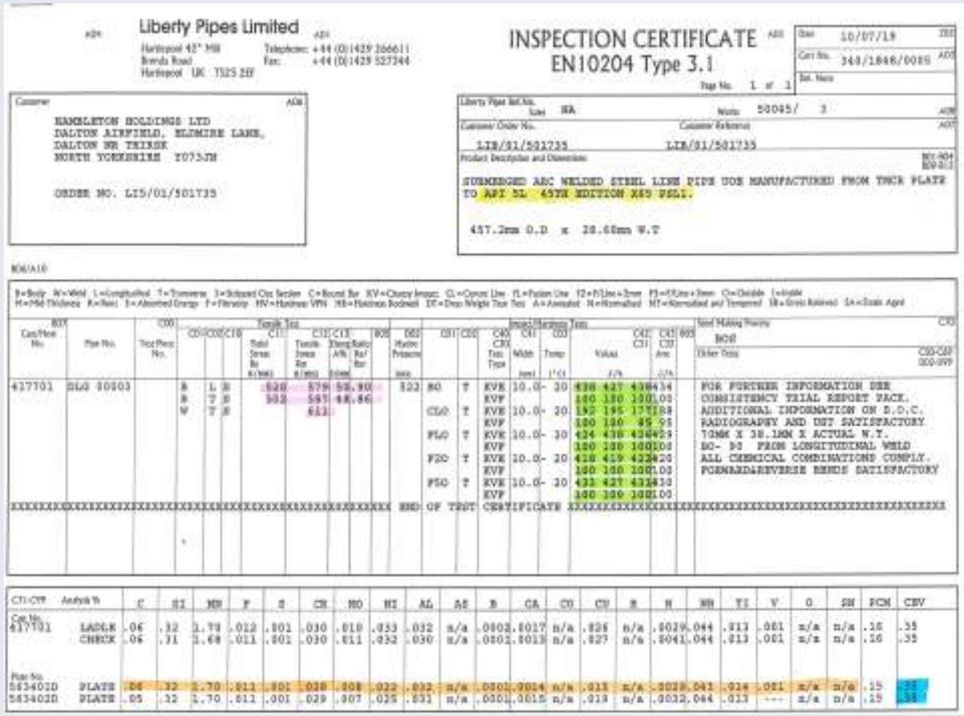


Fitness for Purpose

(declaring the material properties)

Result

Mill Report


Liberty Pipes Limited

INSPECTION CERTIFICATE
EN10204 Type 3.1

HAMBLETON HOLDINGS LTD
DALTON AIRFIELD, ELMIRE LANE,
DALTON NR THIRSK
NORTH YORKSHIRE YO73JH

ORDER NO. LI5/01/501735

SUBMERGED ARC WELDED STEEL LINE PIPE USE MANUFACTURED FROM THCK PLATE TO API 5L 45TH EDITION X65 PSL1.

457.2mm O.D x 28.60mm W.T

FOR FURTHER INFORMATION SEE CONSISTENCY TRIAL REPORT PACK. ADDITIONAL INFORMATION ON D.O.C. RADIOGRAPHY AND UST SATISFACTORY ... ALL CHEMICAL COMBINATIONS COMPLY. FORWARD&REVERSE BENDS SATISFACTORY

Direct Comparisons

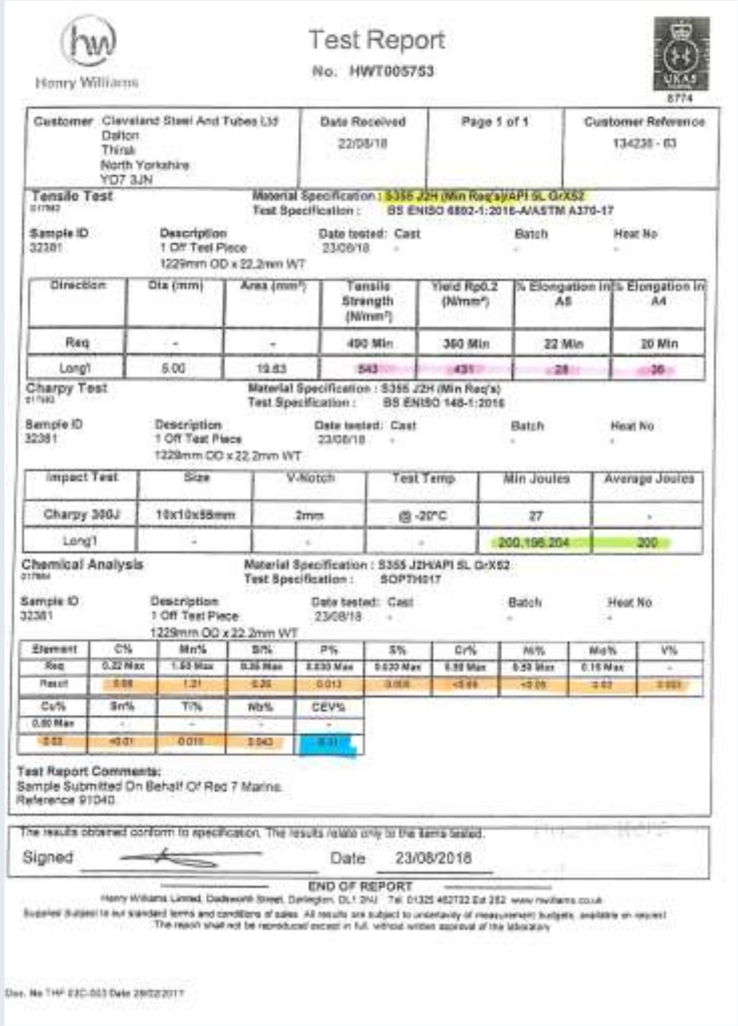
Grade

Strength – Tensile/Yield

Chemical composition

CEV - weldability

Lab Report


Henry Williams

Test Report

No. HWT005753

Customer	Date Received	Page 1 of 1	Customer Reference
Cleveland Steel And Tubes Ltd, Dalton, Thirsk, North Yorkshire, YO7 3JN	22/08/18		134238 - 63

Tensile Test — Material Specification : S355 J2H (Min Req's)/API 5L GrX52 — Test Specification : BS ENISO 6892-1:2016-A/ASTM A370-17

Sample ID 32381 — Description: 1 Off Test Piece, 1229mm OD x 22.2mm WT — Date tested: 23/08/18 — Cast: - — Batch: - — Heat No: -

Direction	Dia (mm)	Area (mm²)	Tensile Strength (N/mm²)	Yield Rp0.2 (N/mm²)	% Elongation in A5	% Elongation in A4
Req	-	-	490 Min	360 Min	22 Min	20 Min
Long'l	5.00	19.63	543	431	28	36

Charpy Test — Material Specification : S355 J2H (Min Req's) — Test Specification : BS ENISO 148-1:2016

Sample ID 32381 — Description: 1 Off Test Piece, 1229mm OD x 22.2mm WT — Date tested: 23/08/18

Impact Test	Size	V-Notch	Test Temp	Min Joules	Average Joules
Charpy 300J	10x10x55mm	2mm	@ -20°C	27	
Long'l	-	-	-	200,196,204	200

Chemical Analysis — Material Specification : S355 J2H/API 5L GrX52 — Test Specification : SOPTH017

Sample ID 32381 — Description: 1 Off Test Piece, 1229mm OD x 22.2mm WT — Date tested: 23/08/18

Element	C%	Mn%	Si%	P%	S%	Cr%	Ni%	Mo%	V%
Req	0.22 Max	1.60 Max	0.55 Max	0.030 Max	0.030 Max	[illegible]	[illegible]	[illegible]	-
Result	[illegible]	1.21	0.20	0.013	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Cu%	Sn%	Ti%	Nb%	CEV%
0.80 Max	-	-	-	-
[illegible]	<0.01	0.011	0.043	[illegible]

Test Report Comments:
Sample Submitted On Behalf Of Red 7 Marine.
Reference 91040.

The results obtained conform to specification. The results relate only to the items tested.

Signed — Date 23/08/2018

END OF REPORT

CLEVELAND STEEL & TUBES LTD

CE Cert

DoP

Weld Cert

CE

2773

Cleveland Steel & Tubes Ltd
Dalton Industrial Estate
Thirsk
North Yorkshire
YO7 3JN

14

Welded steel items – marked A21202 & A21201 [redacted]
Ltd Contract No. C1155
MCFC Etiad Stadium Expansion

Declaration of Performance – No. 83982/JZ

Execution Class 2

BS EN 1090-1: 2009 + A1: 2011

Intended uses:
Structural metallic construction components intended for use in steel structures and concrete structures where the components can be made from hot rolled, cold-formed or with other technologies produced profiles with various shapes, flat products (plates, sheet, strip), bars, castings, forgings made of steel materials.

Declaration of Performance

CST Job No. 83982/JZ

Type: Welded steel items to Execution Class 2 in accordance with component specification for [redacted] Contract C1155 - MCFC Etiad Stadium Expansion, Marked A21202 & A21201

Intended use/s: Structural metallic construction components intended for use in steel structures and concrete structures where the components can be made from hot rolled, cold-formed or with other technologies produce profiles with various shapes, flat products (plates, sheet, strip), bars, castings, forgings made of steel materials.

Manufacturer: Cleveland Steel & Tubes Ltd
Dalton Industrial Estate
Thirsk
North Yorkshire
YO7 3JN

System of assessment and verification of constancy of performance: System 2+

Notified Body: Steel Construction Certification Scheme
4, Whitehall Court
Westminster
London
SW1A 2ES

Notified Body No: 2773

Steel Construction Certificate Scheme has performed (i) initial inspection of the manufacturing plant and factory product control and (ii) continuous surveillance, assessment and evaluation of factory production control and issued Factory Production Control certificate 2773-CPR-0093 and Welding certificate 2773-CPR-0093-WC.

Essential characteristics	Performance	Harmonised technical specification
Tolerances on dimensions and shape	EN 1090-2	EN 1090-1: 2009 + A1: 2011
Weldability	EN 10025-2, S355J2	EN 1090-1: 2009 + A1: 2011
Fracture toughness/impact resistance	S355J2 (27J @ -20°C)	EN 1090-1: 2009 + A1: 2011

Applus RTD UK
9 Bowesfield Crescent,
Stockton - on - Tees, England TS18 3BL
Tel:+44 (0)1642 613660
Fax:+44 (0)1642 601666

Applus RTD

ULTRASONIC TEST REPORT

REPORT No.:		JOB No.: 755	PAGE No.: 1 of 1
ORDER No.:		TEST DATE: 9/3/15	REPORT DATE: As test date

CLIENT: Cleveland Steel Tubes
ADDRESS: Dalton Airfield, Thirsk

EQUIPMENT TYPE: USK 7
EQUIPMENT SERIAL No.: 4253

PROBE	MAKER	mm	FREQ MHz	TYPE	No.
0	WK	10	5	CD	16981
45	WK	10	4	SMAP	858291
60	WK	10	4	SMAP	169012
70	WK	10	4	SMAP	168025

LOCATION OF ITEM OR TEST: Your Works

DESCRIPTION OF ITEM: See Below

COUPLANT: UCA-2M
CAL. BLOCKS: V2
REF. BLOCKS: DAC (3mm hole)
RANGE: 0-100

MATERIAL: Carbon Steel
SURFACE COND.: Clean
HEAT TREATMENT: N/A
TEMPERATURE: Ambient
REQUIRED TEST %: See below

REF. SENSITIVITY 0°: 1st BWE to FSH
SCAN SENSITIVITY 0°: 2nd BWE to FSH
REF. SENSITIVITY SHEAR: DAC
SCAN. SENSITIVITY: DAC +14 dB
TRANSFER CORRECTION: 2dB

TEST STANDARD: BS EN ISO 17640:2010
PROCEDURE No.: 1700-N-UT-01-Rev 2

ACCEPTANCE CODE: BS EN ISO 5817 : 2007
ACCEPTANCE LEVEL: Table 1 Class B

RESULTS:

Client	Order No	O/D	Thk	%age
Cleveland Steel	N/A	762	20.4	100%
ID	Pipe No	Pipe No	Circ	ACC / REJ
	145806	165250	Circ	Acc

INSPECTOR: Ken Stewart
CERTIFICATION: PCN
CERTIFICATE No: 103649

APPROVED BY:

Applus RTD

CLEVELAND STEEL & TUBES LTD

Practical Considerations of Reuse

GRADE – protocol means lower Outcomes

Cost

Availability

Timing

Program impacts

ITS NOT NEW

Design Efficiency (over size/waste)

Issues for fabrication

COSMETICS

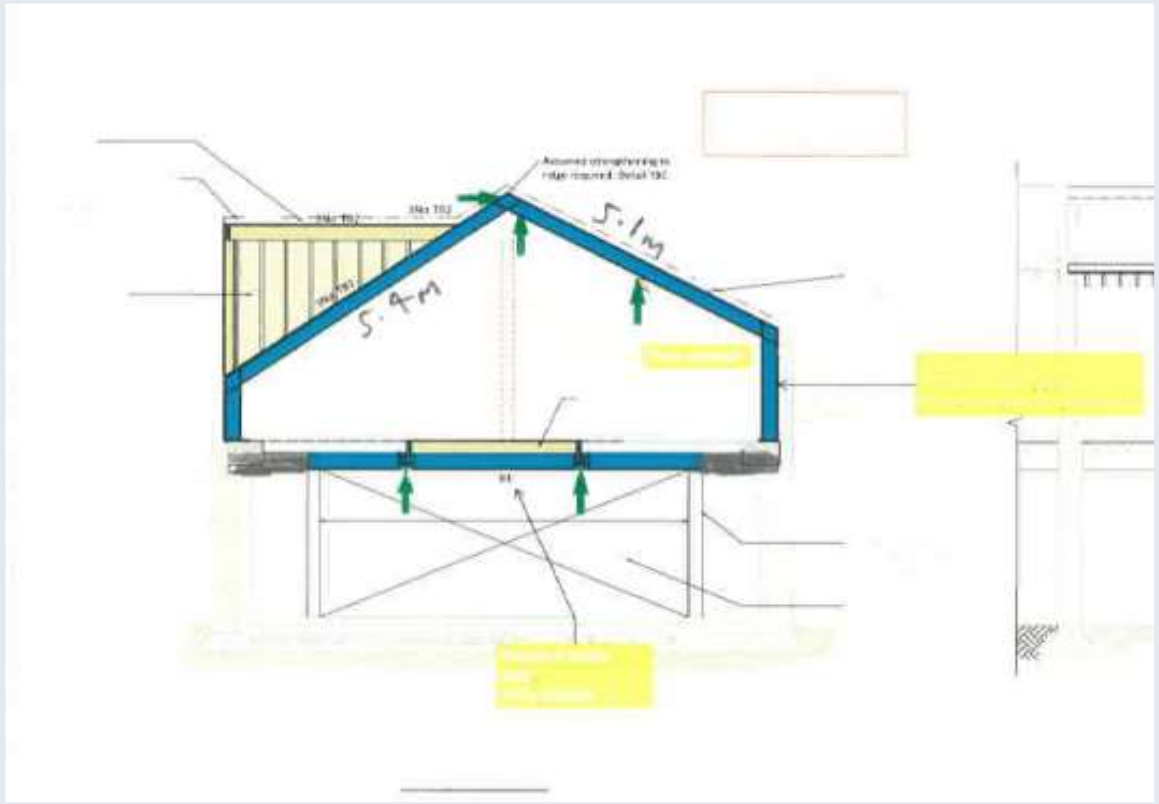
Case Studies

Arkengarthdale Bridge

4T of Carbon saved

CLEVELAND STEEL & TUBES LTD

Simple Reuse



CLEVELAND STEEL & TUBES LTD

Holbein Gardens

40T of Carbon saved

CLEVELAND STEEL & TUBES LTD

Bloomberg

2017

100s of tonnes

Holding up London

Tree of Trees – Platinum Jubilee

Provided by Cleveland Steel in Yorkshire, the design has been optimised to maximise the use of old surplus steel, keeping the level of embodied carbon to a minimum.

CST
CLEVELAND STEEL & TUBES LTD

CLEVELAND STEEL & TUBES LTD

Cleveland Steel & Tubes Ltd
Dalton Industrial Estate, Thirsk, North
Yorkshire, YO7 3JN, United Kingdom

Telephone: +44 (0)1845 577789
Fax: +44 (0)1845 578373

Factory Production Control 2273-CPR-0093

BS EN ISO 9001:2015

BS EN ISO 9001:2015, NHSS 38

As featured by the Daily Telegraph Business club

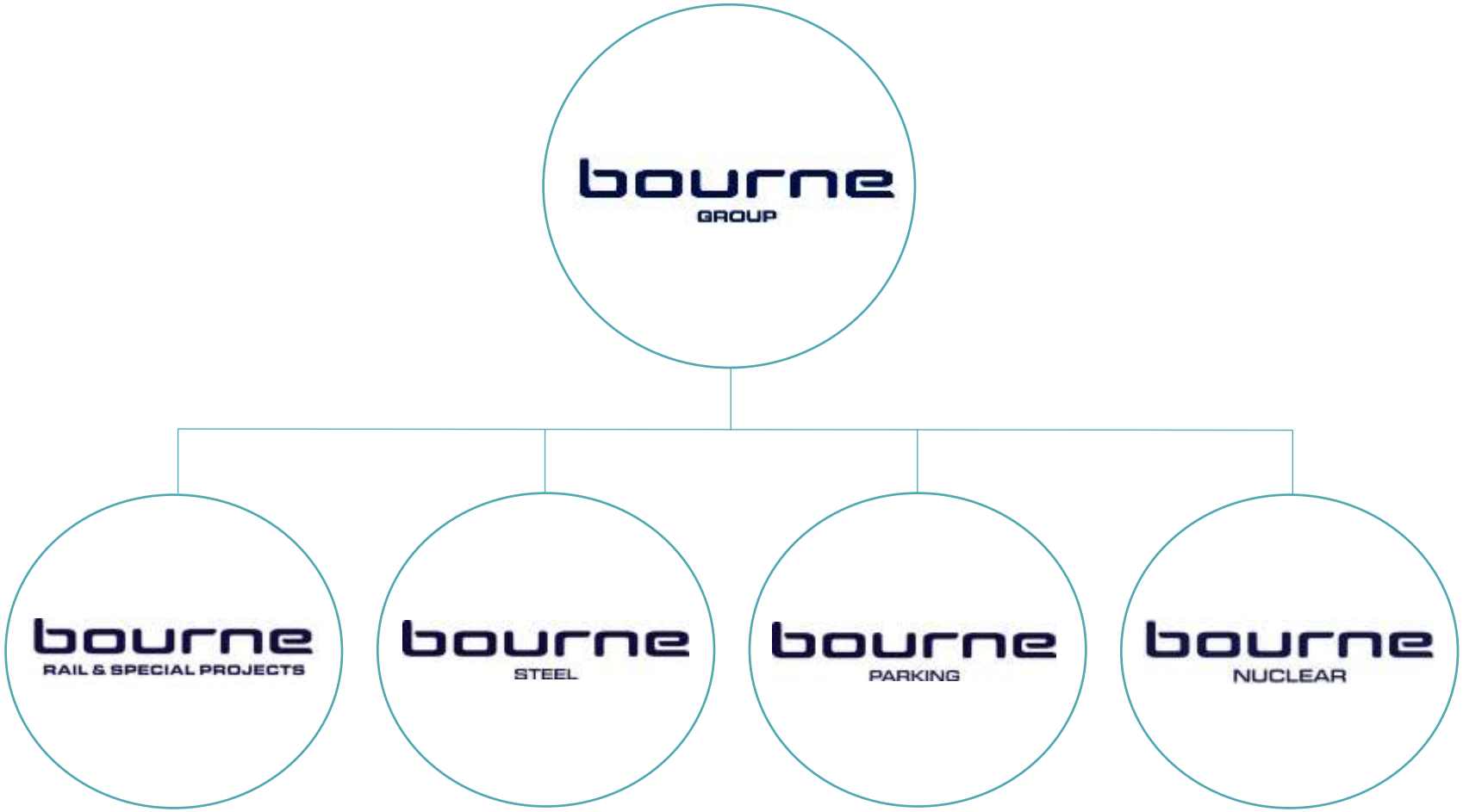
Bianco Group

SUPPLY CHAIN SUSTAINABILITY SCHOOL

The Demand for Steel: Infrastructure Projects

Nigel Moss
Bourne Group
Group Development Director

Nigel Moss – Group Development Director



www.bournegroup.ltd

Steel is at the centre of everything we do.

- RAIL
- COMMERCIAL
- MOD HIGH SECURITY (EX CL 4)
- NUCLEAR
- DESIGN & BUILD
- CAR PARKS
- MODULAR
- BRIDGES
- LEISURE & RETAIL
- AIRPORTS
- ARCHITECTURAL METALWORK
- HEALTH (HOSPITALS)
- POWER & ENERGY
- EDUCATION
- REFURBISHMENT
- RESIDENTIAL

Decarbonising Steel - the Bourne Approach

CLIMATE GROUP
STEELZERO
In partnership with Responsible Steel

The Bourne Group were founding signatories and have committed to ‘steel zero’, which collectively seeks to pursue a net zero target in raw steel production by 2050

<u>Practically</u>

This influences every steel purchasing decision we make as we aim towards our interim 2030 target.

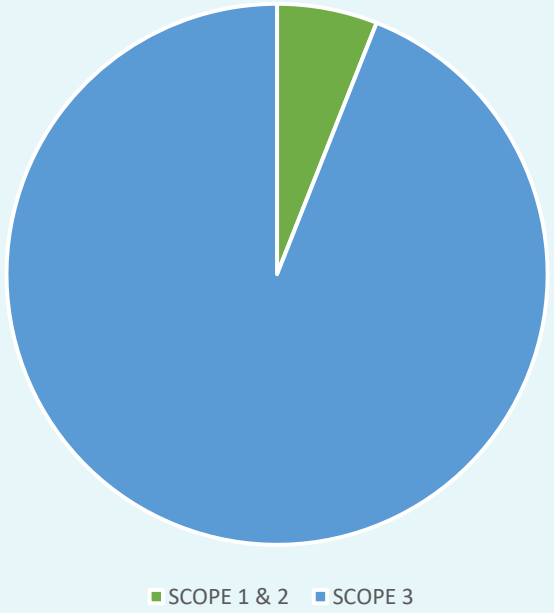
Embrace the circularity of steel

<u>Practically</u>

Strong, flexible material forming very efficient structures
Known and tested quality
100% recoverable and recyclable
The original “Design for Manufacture and Assembly”
Minimum waste levels through manufacture

Practical and Measured Approach

CARBON FOOTPRINT OF STRUCTURAL STEEL



SCOPE 3 REDUCTION:

COMMITMENT TO STEEL ZERO – LOW EMBODIED CARBON STEEL

BES 6001 RESPONSIBLE SOURCING

CARBON BENCHMARKING – USE OF ISTRUCTE CARBON REDUCTION TOOL

OPPORTUNITY MATRIX FOR EACH PROJECT – TARGET SETTING DRIVING CARBON REDUCTION

OPTIMISATION OF DESIGN – REDUCING DEMAND

INTEGRATION OF REUSED STEEL

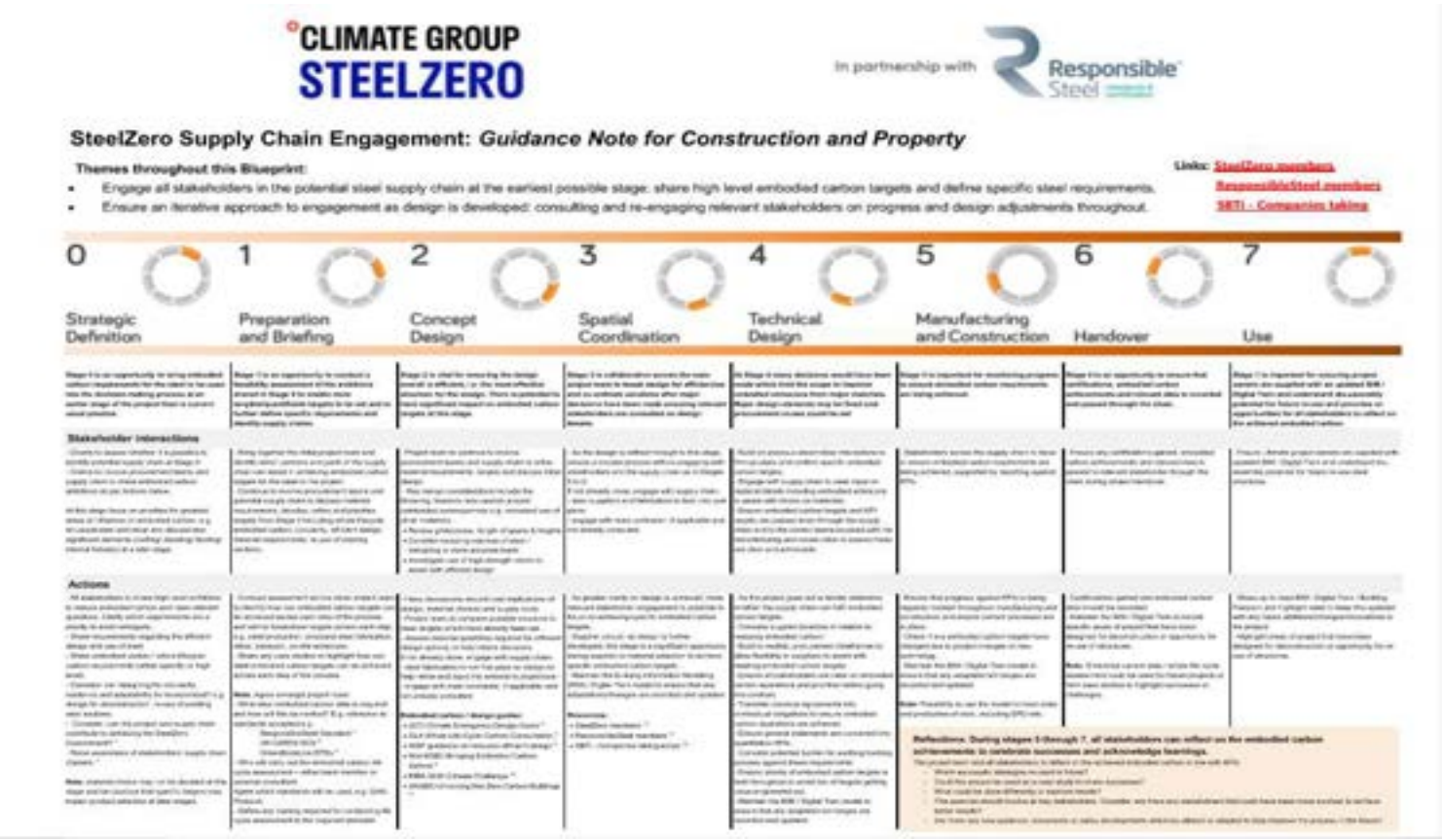
- THE BOURNE GROUP IS COMMITTED TO INNOVATE AND EXPAND CARBON REDUCTION THROUGH
  - FOCUSSED DESIGN
  - GREATER RE-USE OF MATERIAL
  - INCREASED OFF-SITE MANUFACTURE
  - FURTHER ALLEVIATION OF WASTE

- ENVIRONMENTAL POLICY INCORPORATES SUSTAINABILITY OUTCOMES
- PUBLISHED SUSTAINABILITY MANAGEMENT PLAN INCLUDING:
  - RESPONSIBLE SOURCING
  - STEELZERO
  - GREENHOUSE GAS EMMISSION
  - ENERGY USE
  - WASTE PREVENTION/MANAGEMENT
  - WATER USAGE
  - PROCUREMENT/SUPPLIER MANAGEMENT
  - LIFE CYCLE ASSESSMENT
  - TRANSPORT IMPACTS
  - BIODIVERSITY/SITE STEWARDSHIP
  - HUMAN RIGHTS
  - BUSINESS ETHICS/MODERN SLAVERY
  - EMPLOYMENT AND SKILLS
  - LOCAL COMMUNITIES
  - SUPPLY CHAIN SUSTAINABILITY SCHOOL

- APPROVED SCIENCE BASED TARGET

- COMMITTED TO CARBON REDUCTION PLAN

Early Project Engagement
=
Greatest Carbon Reduction



CLIMATE GROUP
STEELZERO

In partnership with Responsible Steel

SteelZero Supply Chain Engagement: ***Guidance Note for Construction and Property***

Themes throughout this Blueprint:

- Engage all stakeholders in the potential steel supply chain at the earliest possible stage: share high level embodied carbon targets and define specific steel requirements.
- Ensure an iterative approach to engagement as design is developed: consulting and re-engaging relevant stakeholders on progress and design adjustments throughout.

Links: SteelZero members
ResponsibleSteel members
SBTi - Companies taking

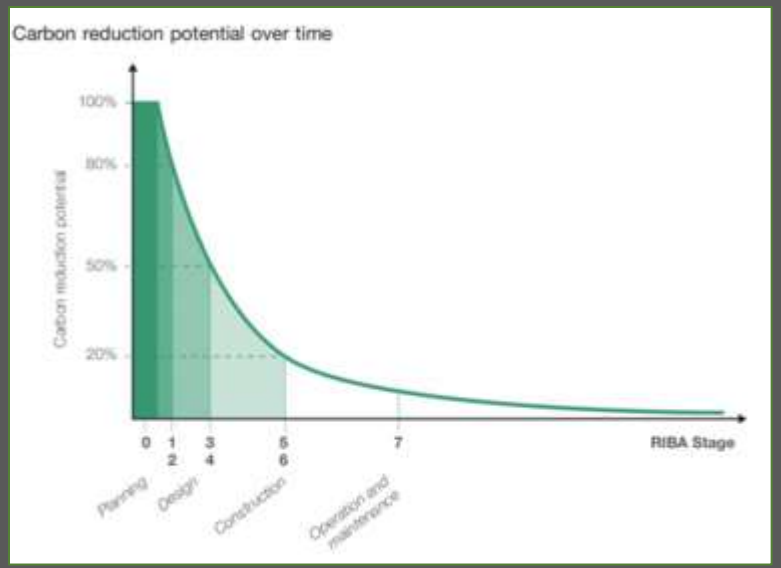
0	1	2	3	4	5	6	7
Strategic Definition	Preparation and Briefing	Concept Design	Spatial Coordination	Technical Design	Manufacturing and Construction	Handover	Use
Stakeholder interactions							
Actions							

COLLABORATION:

- ENGAGE WITH CLIENT DESIGN TEAM DURING INITIAL STAGES OF THE PROJECT TO IDENTIFY OPPORTUNITY TO ACHIEVE REDUCTION OF EMBODIED CARBON

BENCHMARKING:

- DEVELOPMENT AND INTEGRATION OF ISTRUCTE CARBON REDUCTION TOOL ACROSS ALL TENDERS TO CALCULATE AND COMPARE EMBODIED CARBON



Reuse – Making it happen

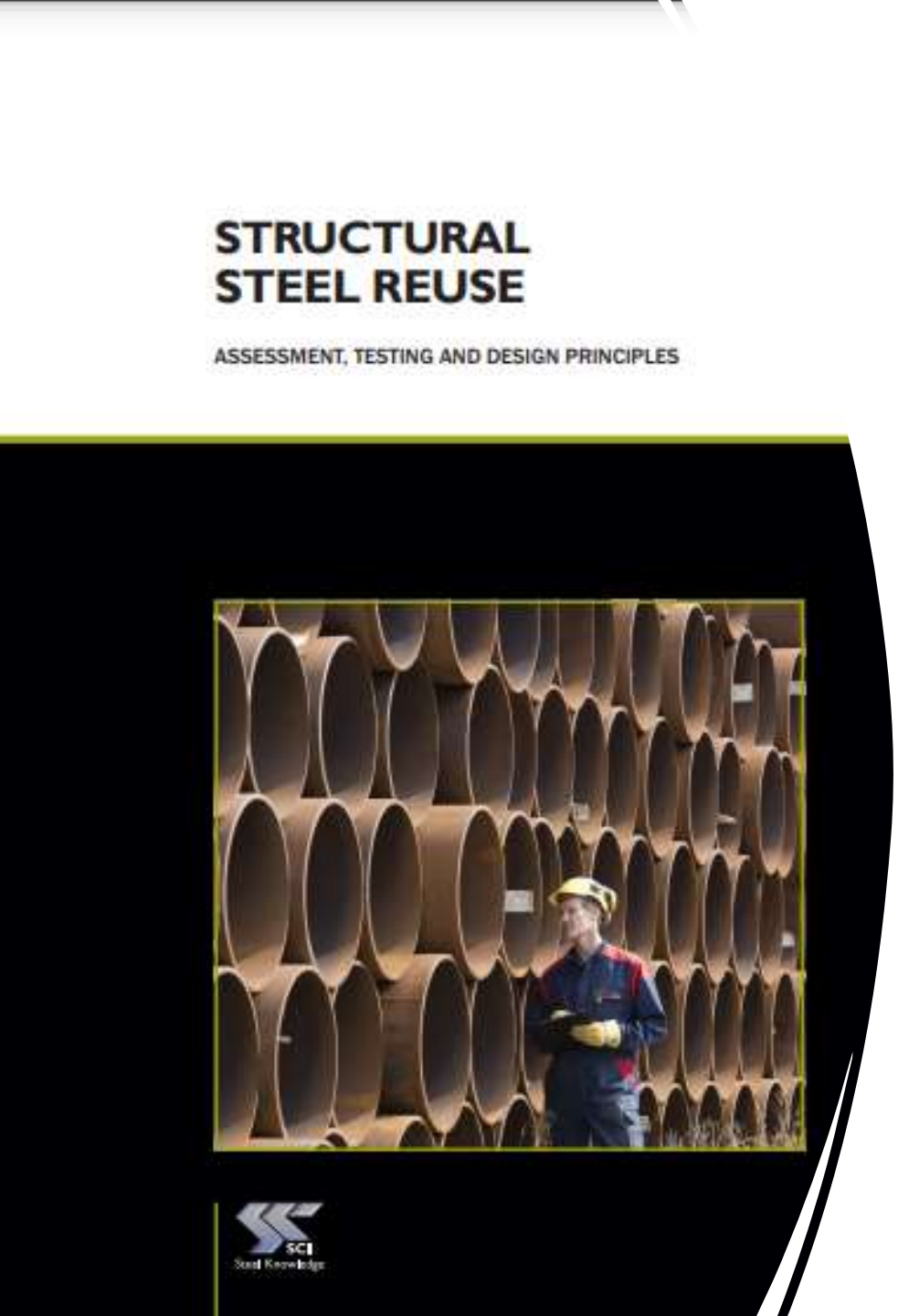
- Early engagement – use of focussed PCSA
- Appropriate Specification
  - SCI P427
  - BCSA Model specification for the purchase of reclaimed steel sections
- Flexible design
- Available stock – development
- Harvesting for your project
- Utilisation
- Waste
- “We have the tools”

Reuse - The Prize

Steel Type	Producer	Process	GWP (A1-A3) kg CO2 eq/t
Structural Hollow Sections	Tata	BOF/Re-Roll	2500
Steel Plate	Metivest	BOF/Re-Roll	2250
Rolled Sections I, H, C, L	British Steel	BOF	2450
Hi-Star Rolled Sections	Arcelor Mittal	EAF	524
Xcarb 100% scrap 100% renewable energy	Arcelor Mittal	EAF	~300
Re-use	All	All	~50

BOF = Basic Oxygen Furnace (**~70% Global Production)**

EAF = Electric Arc Furnace (**~30% Global Production)**



Guidance for Assessment, testing and design

Steel Construction Institute Publication P427 covers

- Reclaim and reuse process
- CE marking and material declaration
- Design recommendations
- Assessment of reclaimed materials
- Responsibilities for Stockholders
- Test Programme
- Fabrication issues

The Value Chain is Developing

- Major Developers are seeking to add their redundant structures to stock
- Demolition moving to De-construction
- Scrap recyclers are becoming stockholders
- De-fabrication and surface preparation at stockholder
  - Agreed delivery conditions
  - Ease of handling and stocking
  - Waste reduction/instant recycle of unwanted scrap
  - Cut to length to minimise transport
- Connection design to suit re-use
- Fabrication and Quality procedures to deal with retained details
- Holes
- Internal Stiffeners

Climate emergency Σ Steel reuse

4. Zero waste

Delivering steel's circular economy potential

Steel reuse is now a viable low-carbon option for all parties to a project, as this article explains from the perspectives of contractor, steel producer, fabricator, engineer and client.

Introduction

The contractor

David Moylan (Erith Group)

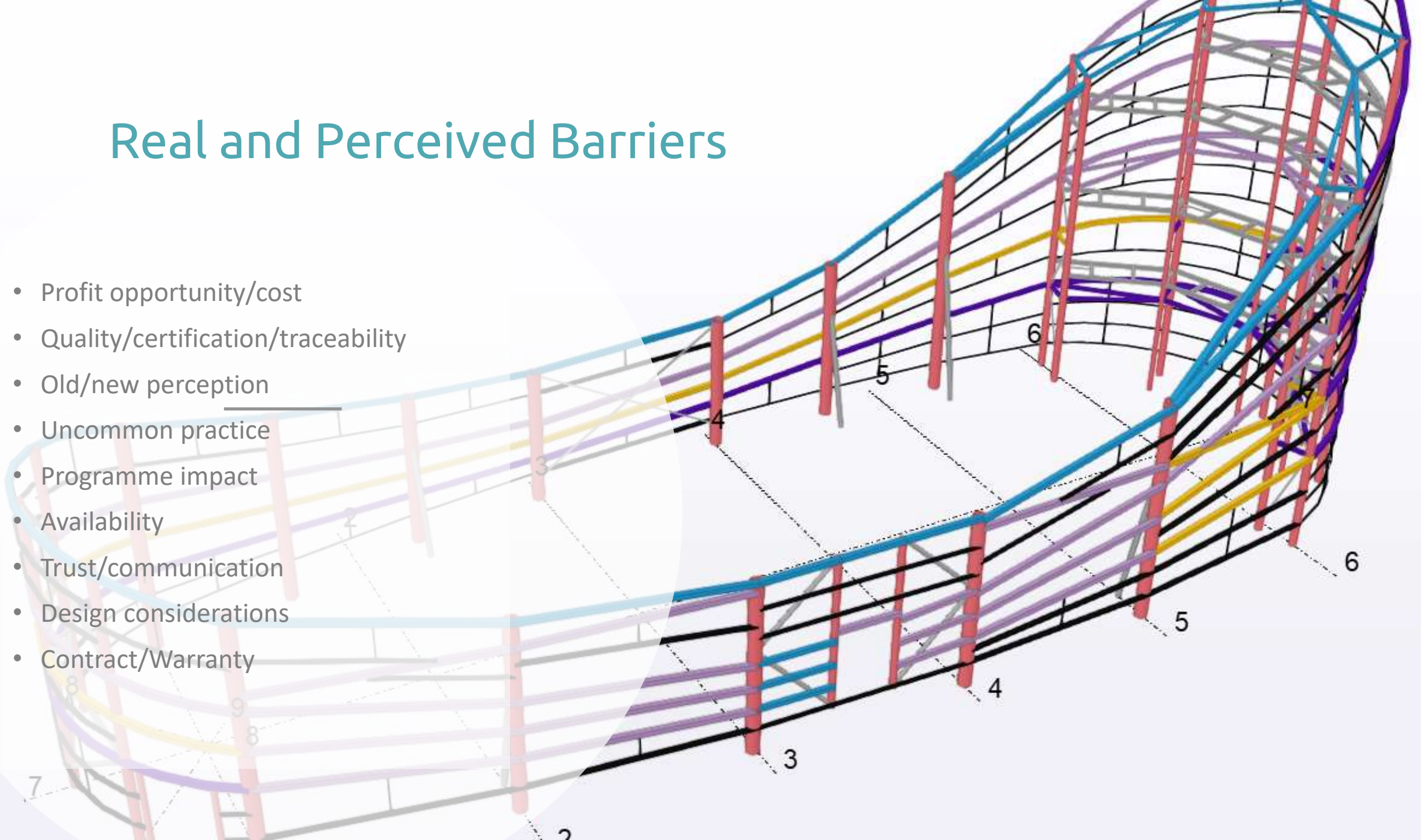
The reusable steel producer

Bill Firth (EMR)

Available Free at istructe.org

Real and Perceived Barriers

- Profit opportunity/cost
- Quality/certification/traceability
- Old/new perception
- Uncommon practice
- Programme impact
- Availability
- Trust/communication
- Design considerations
- Contract/Warranty



The Possible

45 tonnes of repurposed steel

=

100+ tonnes of embodied carbon saved

Early engagement throughout the value chain

Find it here!

Energy and carbon e-resources
supply chain sustainability school

https://www.supplychainschool.co.uk/topics/sustainability/energy-and-carbon/

Science Based Targets: Sustainability Short

An increasing number of businesses are setting science-based targets to reduce their carbon emissions. This Sustainability Short looks at what SBTs are, why they're relevant to you, and how you can participate.

UPPLY CHAIN SUSTAINABILITY SCHOOL

Thank you

Any more questions?

SUPPLY CHAIN SUSTAINABILITY SCHOOL

We need your feedback please

Click here for the feedback form
https://forms.office.com/e/KBxRyCTJRH

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SUPPLY CHAIN SUSTAINABILITY SCHOOL

0207 697 1977

info@supplychainschool.co.uk

supplychainschool.co.uk