



Climate Action at worldsteel

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Change

worldsteel

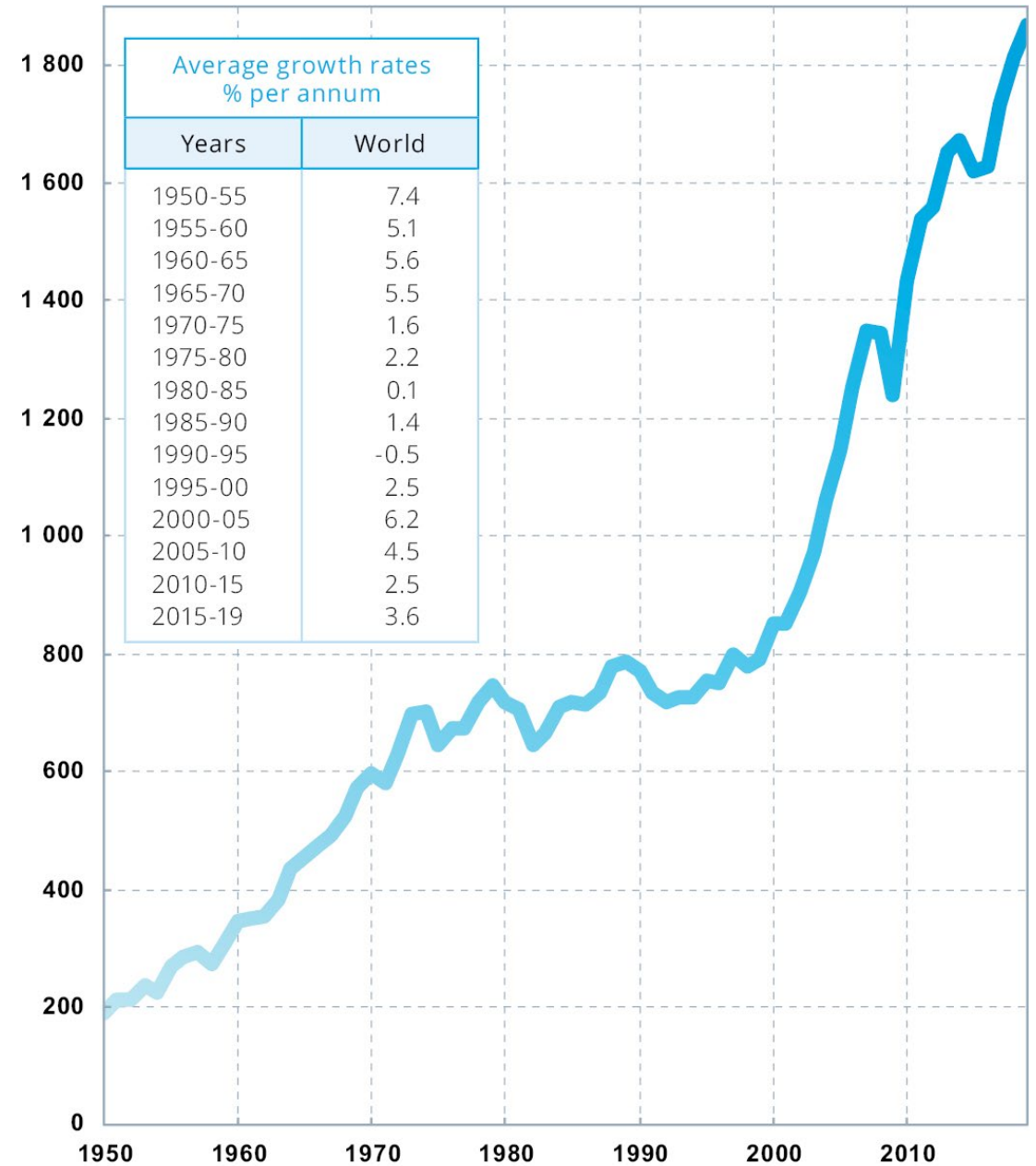
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The scale of the challenge

In 2022 1.9 billion tonnes of crude steel were produced, an increase of 120% since 2000

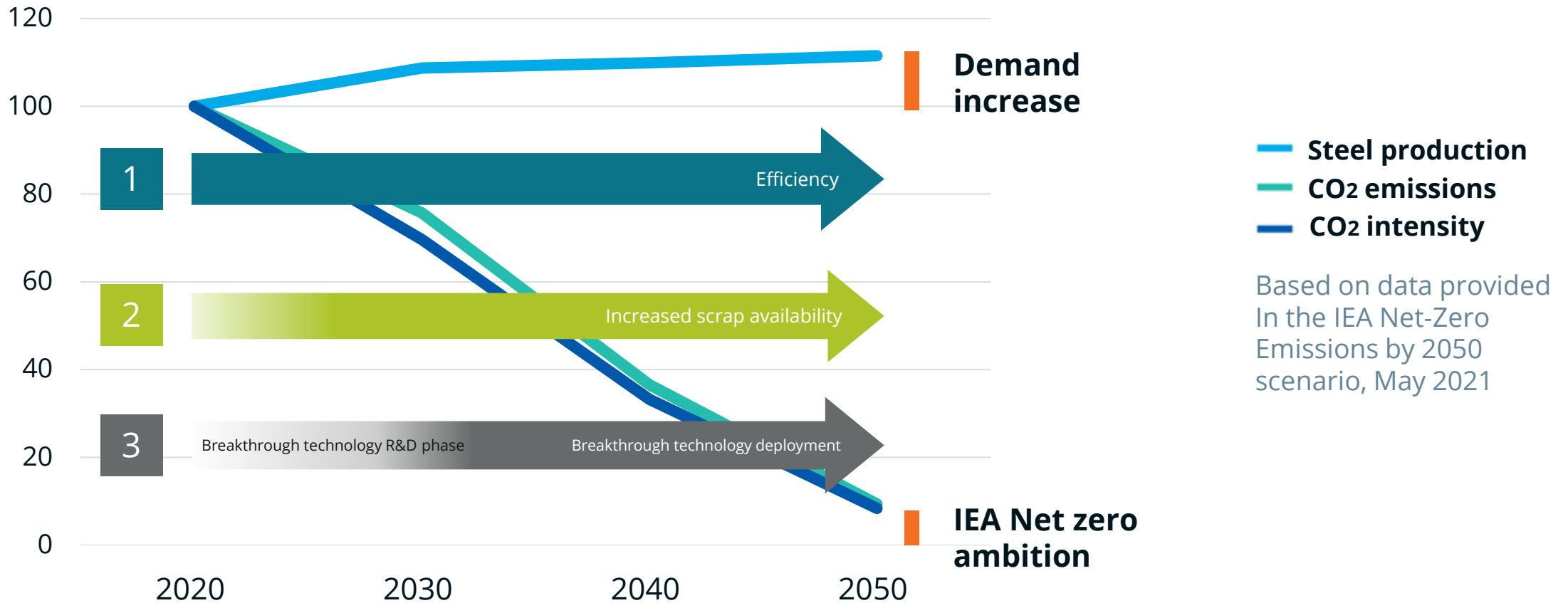
In 2020, on average, every tonne of steel produced led to the emission of 1.9 tonnes of CO₂.

In 2020, the total direct emissions were of the order of 2.6 billion tonnes, representing between 7% and 9% of global anthropogenic CO₂ emissions.



IEA scenarios and our approach

Steel production, total CO2 emissions and CO2 intensity 2020-2050 under the International Energy Agency (IEA) Net-Zero Emissions scenario (NZS)



The interest in the steel transition



Net Zero Steel



GREENHOUSE GAS PROTOCOL



#CDPSupplyChain



Net Zero Steel Pathway Methodology Project



Key themes in the debate

- Moving from long-term commitments and targets to implementation including measurements and accountability
 - An increasing desire to harmonise and work together
 - Increased focus on traceability, claims that can be made and chain of custody to prevent green washing.
- There is a growing recognition that **one** definition of low-carbon / near zero steel is neither likely to be feasible nor desirable – we will need a set of definitions for each of the different purposes / regions.
- To ensure interoperability, there is a need for common measurement standards and accounting rules for the building blocks that make up the steel supply chain.

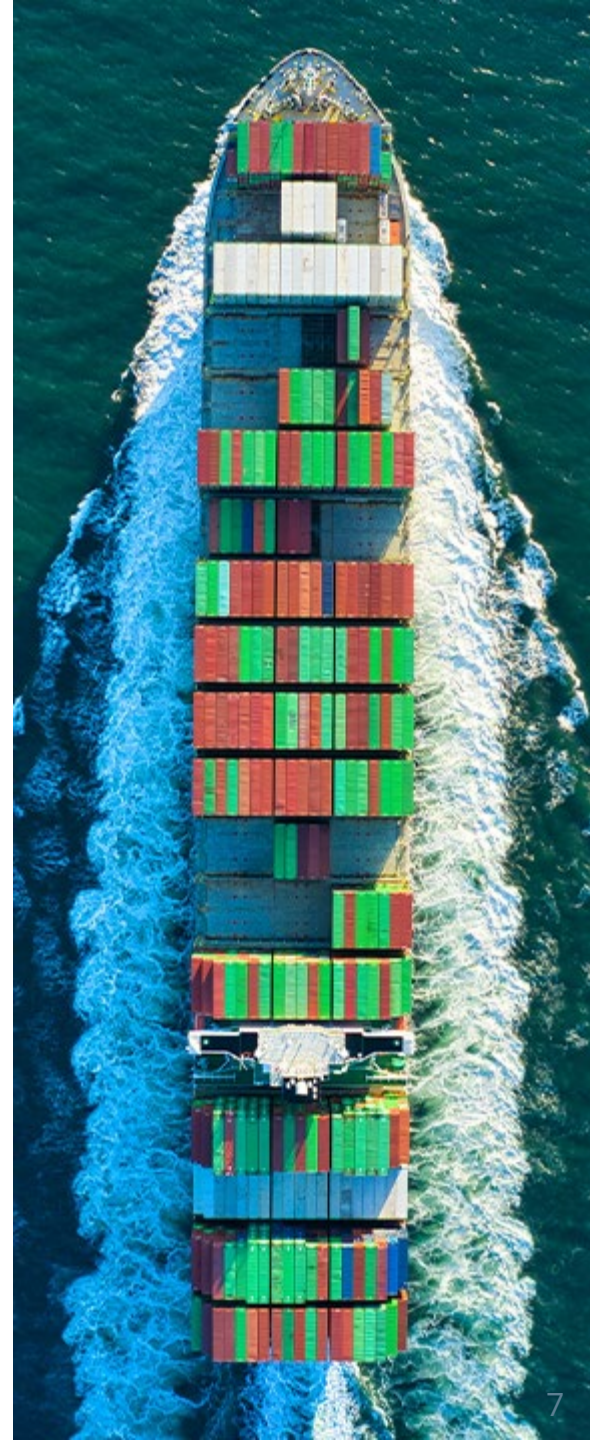


Observations

- It is important to have an ongoing discussion with stakeholders about the steel industry and the ongoing transition
- Main participation in international initiatives are still from EU and North America. Often broader representation from industry than from governments.
- It is crucial to engage developing and emerging economies and ensure their active participation
- New organisations and countries are joining the discussions

Principles for global action

- Global applicability – inclusive approach, not leaving anyone behind
- Technology neutrality – letting companies choose the best options in their circumstance
- Material neutrality – consider intermaterial competition in all applications
- Sound methodologies and credible data sources

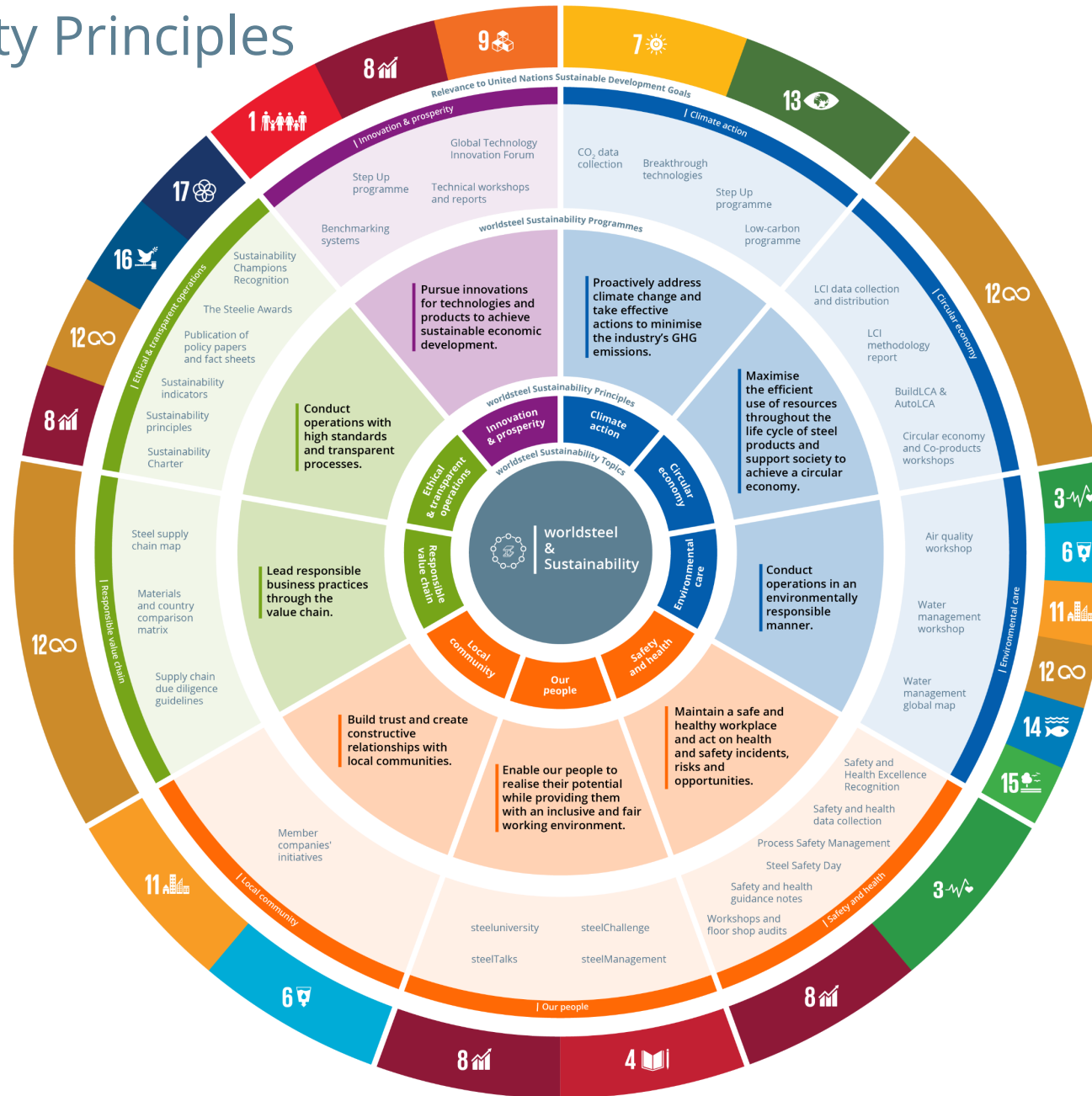


How worldsteel can contribute

We interact with international initiatives in different ways:

- Provide industry expertise – involve experts if and when required
- Provide a global view
- Provide data where appropriate and as mandated by members
- Share information about initiatives with worldsteel members and where appropriate collect comments
- Organise webinars etc. where initiatives can inform worldsteel members of their activities and get feedback
- ‘Reasonability’ checks of the assumptions made

Our Sustainability Principles

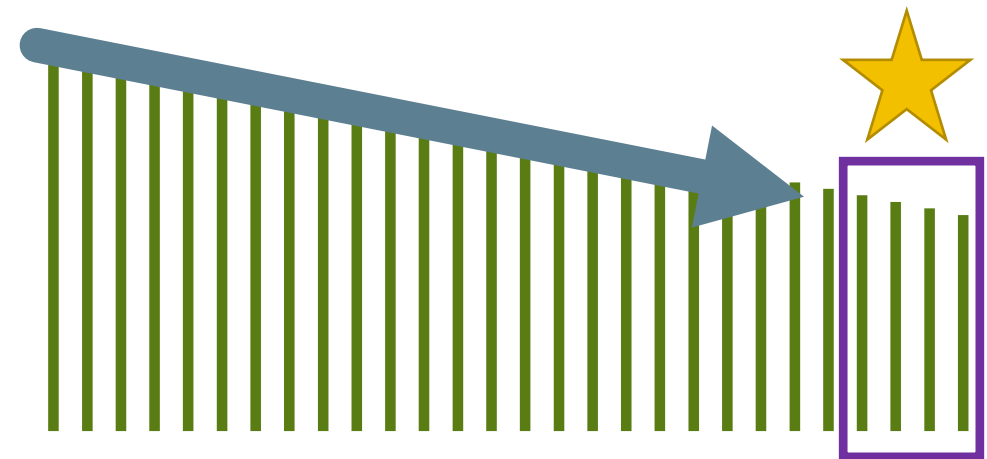


Why step up?

- The industry needs to take action before breakthrough technologies are commercially available
- In 2019 worldsteel members agreed to an industry wide improvement challenge named step up
- The objective is for the steel industry to reach maximum level of performance for emissions and energy intensity using existing proven installed technology and practices.

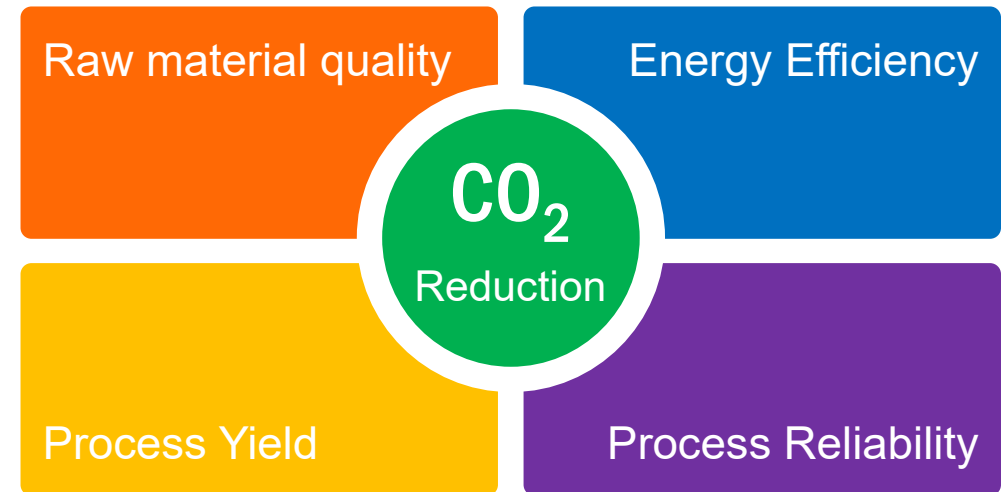


Emissions and Energy Intensity /t CS



Levers of improvement

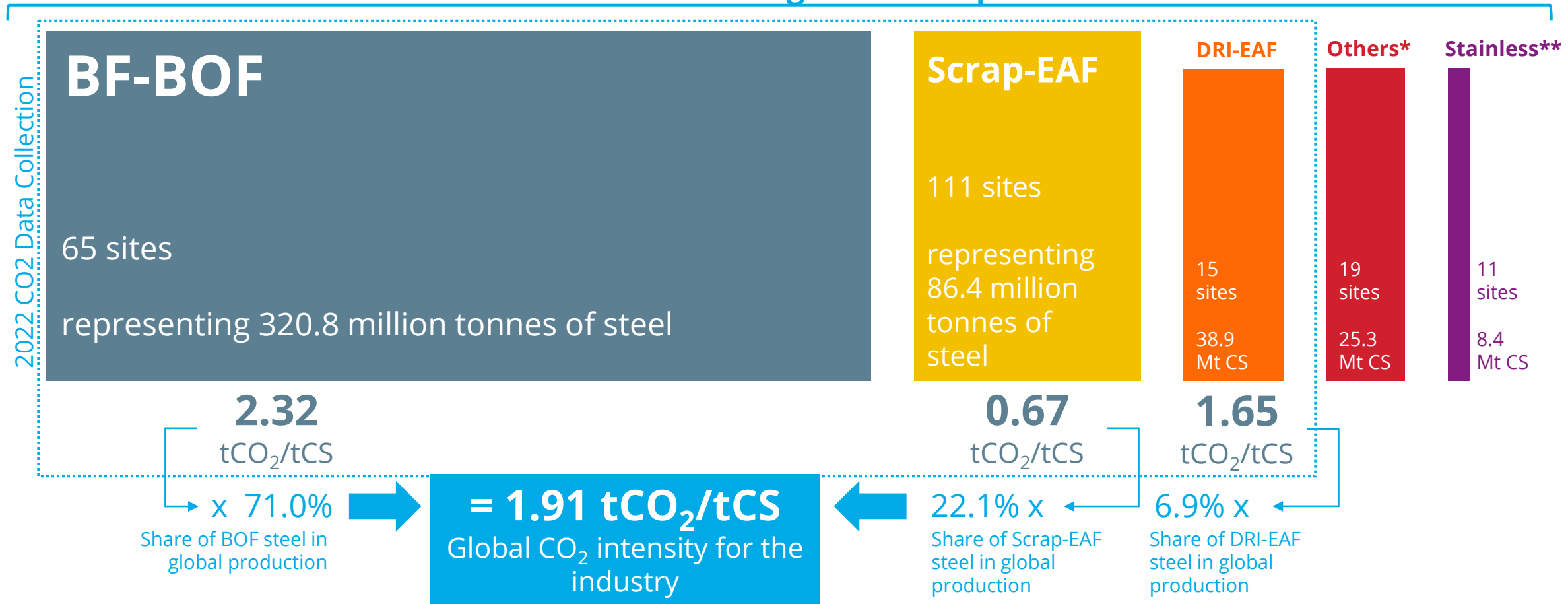
- Over a decade of benchmarking worldsteel has identified 4-key levers having the most impact on emission intensity (tCO₂/tCS)
- Best performance can come from existing assets and best operating practices
- More than 25 reviews carried out to date in 10 Countries (China, Russia, Netherlands, India, Saudi Arabia, UAE, Oman, Qatar, Brazil, Argentina, Slovak Republic)



CO₂ data collection and analysis

Annual site-level data, following the worldsteel CO₂ methodology, is provided by members. Applying worldsteel criteria to the data, sites are classified in 5 Classes. For each, a class **weighted average CO₂ Intensity** is calculated, weighted by each site's production.

Covers 24.8% of the 2021 global steel production



*Others refer to any unconventional site that does not meet the criteria for the alternative classes

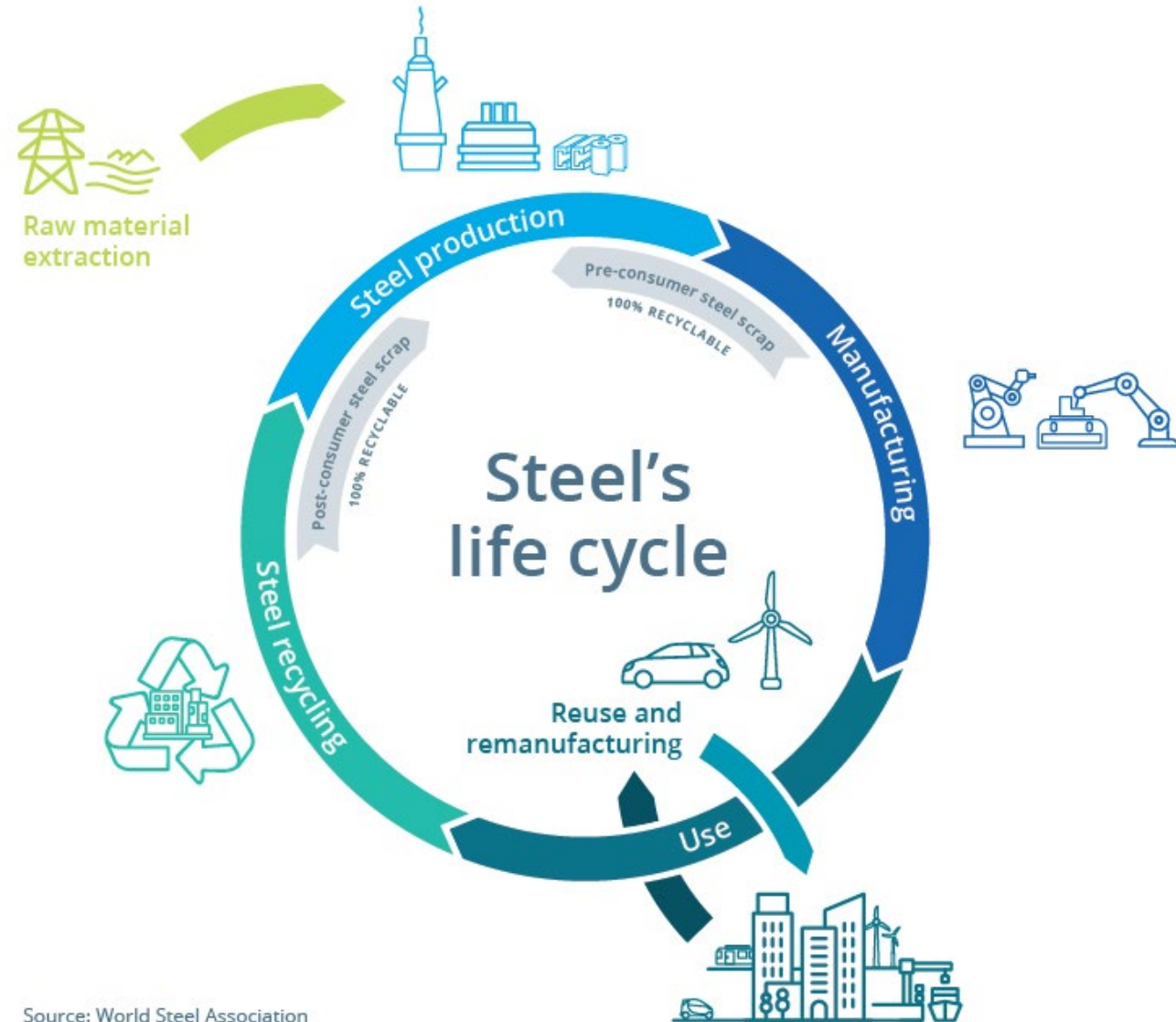
** Refer to worldstainless CO₂ report for further details

Our performance: Sustainability Indicators

INDICATORS*	UNIT	2019	2020	2021	
ENVIRONMENTAL PERFORMANCE					
1.	CO₂ emissions intensity	tonnes CO ₂ per tonne crude steel cast	1.85	1.89	1.91**
2.	Energy intensity	GJ per tonne crude steel cast	20.08	20.70	21.31**
3.	Material efficiency	%	97.49	97.86	97.34
4.	Environmental management system	%	97.16	96.13	95.50
SOCIAL PERFORMANCE					
5.	Lost time injury frequency rate	injuries per million hours worked	0.83	0.85	0.81
6.	Employee training	training days per employee	6.90	7.15	6.71
ECONOMIC PERFORMANCE					
7.	Investment in new processes and products	%	7.09	8.03	6.41
8.	Economic value distributed	%	98.27	97.77	93.83

Life Cycle Assessment

- Annual data collection, began in 1995
- Process and site level data collected from >150 steel making sites
- Data generated for 17 steel products including hot rolled coil, plate, rebar, sections, galvanised steel and tinplate
- Covers the impact of steel in product applications from cradle to gate, and can include the benefits of reuse and recycling.
- All environmental impacts covered: global warming potential, resource depletion, acidification, water quality etc.
- Global and regional datasets available
- Developed in line with ISO 14040, 14044 and ISO 20915
- Data collection open to all worldsteel members



Source: World Steel Association

worldsteel LCA eco-profile Asia | Cold rolled coil



Declared product	1 metric tonne cold rolled coil
System boundary	Cradle-to-gate + end-of-life
Production routes	BOF and EAF
Geographic scope	Asia average
Normative reference	worldsteel LCI methodology report, ISO 14040/44
LCIA methodology	Selected indicators according to EN 15804+A2:2019
Allocation of co-products	System expansion
Owner of the declaration	World Steel Association
Publication date	June 2023
Verification	Externally - worldsteel methodology Internally - applied data Internally - eco-profile

worldsteel

This LCA eco-profile refers to the life cycle assessment results of cold rolled coil as rolled coil. It is based on the worldsteel LCA methodology report, ISO 14040/44. The results are presented in the worldsteel LCI Study Report as well as the worldsteel Methodology Report 2017. Other LCI data may have different scopes, boundaries and implement different methodologies.

Declared product

The presented results refer to a declared unit of 1 metric tonne of cold rolled coil representing the Asia industry average.

Product description

Cold rolled coil, obtained by a further thickness reduction of a pickled hot rolled coil at low temperature in a cold-reduction mill; can be further processed. Used as primary rolled coils and coated coils. Typical thickness between 0.15 - 3 mm. Typical width between 1000 - 2000 mm.

worldsteel LCA eco-profile Europe | Hot-dip galvanised coil



Declared product	1 metric tonne hot-dip galvanised coil
System boundary	Cradle-to-gate + end-of-life
Production routes	BOF and EAF
Geographic scope	Europe average
Normative reference	worldsteel LCI methodology report, ISO 14040/44
LCIA methodology	Selected indicators according to EF3.0 + energy and water indicators
Allocation of co-products	System expansion
Owner of the declaration	World Steel Association
Publication date	June 2023
Verification	Externally - worldsteel methodology Internally - applied data Internally - eco-profile

worldsteel

This LCA eco-profile refers to the life cycle assessment results of hot-dip galvanised coil as hot-dip galvanised coil. It is based on the worldsteel LCA methodology report, ISO 14040/44. The results are presented in the worldsteel LCI Study Report as well as the worldsteel Methodology Report 2017. Other LCI data may have different scopes, boundaries and implement different methodologies.

Declared product

The presented results refer to a declared unit of 1 metric tonne of hot-dip galvanised coil representing the Europe industry average.

Product description

A steel coil treated by passing cold rolled coil through a molten zinc bath, to coat the steel with zinc to provide corrosion resistance. Typical thickness between 0.3 - 3 mm. Typical width between 1000 - 2000 mm. They have excellent forming properties, paintability, weldability, and are suitable for forming, pressing and bending. Applications include domestic applications, building elements, roofing applications, automotive applications (e.g. body in white for car parts), lighting fixtures, drums and various kinds of sections applications, profiled sheets, etc.

worldsteel LCA eco-profile Global | Sections



Declared product	1 metric tonne sections
System boundary	Cradle-to-gate + end-of-life
Production routes	BOF and EAF
Geographic scope	Global average
Normative reference	worldsteel LCI methodology report, ISO 14040/44
LCIA methodology	Selected indicators according to EN 15804+A2:2019
Allocation of co-products	System expansion
Owner of the declaration	World Steel Association
Publication date	June 2023
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worldsteel LCA eco-profile

This LCA eco-profile refers to the life cycle assessment results of Global sections by the World Steel Association. It aims at the transparent communication of life cycle related environmental indicators on a global basis. All presented impact assessment results build on the worldsteel 2022 LCI Study Report as well as the worldsteel Life Cycle Inventory Methodology Report 2017. Other LCI data may have different scopes, boundaries and implement different methodologies.

Declared product

The presented results refer to a declared unit of 1 metric tonne of sections representing the Global industry average.

Product description

A steel section rolled on a hot rolling mill. Steel Sections include I-beams, H-beams, wide-flange beams, and sheet piling. This product is used in construction, multi-storey buildings, industrial buildings, bridge trusses, vertical highway supports, and riverbank reinforcement etc.

Open Forum 2022

- The aim of the Open Forum is to engage with stakeholders in the steelmaking ecosystem, including equipment manufacturers, suppliers, the finance sector and academia to discuss issues of common interest to steel industry stakeholders
- Inaugural event, 4-5 October 2022, Brussels, Belgium
- Over 100 participants
 - 50 worldsteel members
 - 50 external organisations



Exceptional engagement and very positive feedback from participants on topics, speakers and organisation

Themes of the Open Forum 2022

Open Forum in 2022 focused the discussion on the following topics:

- **The pathway to Paris** – Where are we and how might the transformation of the steel sector play out as the world looks to achieve the goals of the Paris Agreement?
- **Implementation activities** – What activities are taking place among companies and in the supply chain?
- **Measuring and tracking the transition** - How do we measure and verify emissions, technology implementation etc. to know if the industry and/or individual steel companies are on track?
- **Raw materials and energy requirements for steel industry's transition** – What demands will the introduction and roll out of breakthrough technologies put on the input materials required by the industry?
- **How customers and finance are shaping the market for low-carbon steel** – In order to create a business case for investments in low-carbon steel production it is crucial to know that there will be a market for the products once they are produced. This session will give an overview of some existing initiatives that aim to increase the demand for low-carbon steel and how this is being supported by the finance sector.



Engaged discussion on all topics

Several roadmaps showing what the transition might look like are now available

- Reaching net-zero emissions by 2050 is technically and economically possible but will require deployment of multiple available and emerging technologies.
- Early progress in the 2020s is essential to stay within the carbon budget.
- The transition in different regions will depend on existing assets, energy resource availability, policies, and regional demand for steel.
- The transition will have significant resource implications, with large increases in required hydrogen, electricity, and natural gas inputs, but a stark decline in coal.
- Commercialisation and deployment of technologies to achieve net zero will require major investment inside and outside the steel industry
- A new level of partnership between policymakers, industry leaders, and financial institutions will be needed



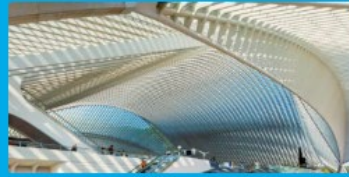
worldsteel website

Restructured and expanded public website content in the new Climate Action section includes the policy paper and:

- Fact sheets detailing the suite of low-carbon breakthrough technologies currently under development.
- Examples of member initiatives in related areas, including new business practices encouraging low-carbon market development
- Work being carried out by other international organisations including the IEA and ResponsibleSteel

Climate Action

worldsteel policy paper



Open Forum



Breakthrough Technology Conference



Efficiency and Step Up



Scrap use



Breakthrough technologies



Climate Action Data Collection



Climate Action member initiatives



External initiatives



worldsteel contact



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