ArcelorMittal Europe – Long Products

ArcelorMittal

XCarb®

Recycled and renewably produced

Sections and merchant bars

"We have an important role to play in helping society deliver the objectives of the Paris agreement and are determined to lead our industry's transition to carbon neutral steel."

Aditya Mittal,
CEO, ArcelorMittal

XCarb®

Towards carbon neutral steel

What is XCarb®?

XCarb® is the new brand name for ArcelorMittal's ongoing global programme of steelmaking innovation targeted at carbon-neutral steel by 2050. The initiatives that are part of XCarb® aim to reduce the carbon footprint of ArcelorMittal and of our customers.

Our ambition is to position ArcelorMittal as the leading global steel company engaged in the most important challenge faced by the industry – that of producing all the steel the world needs in an environmentally sustainable way.

What is XCarb® recycled and renewably produced?

One of the first decarbonisation initiatives from ArcelorMittal Europe – Long Products is XCarb® recycled and renewably produced.

XCarb® recycled and renewably produced has been designed for products made via the Electric Arc Furnace ('EAF') route - powered by renewable electricity - using scrap steel. Steel produced by ArcelorMittal Europe – Long Products under our XCarb® recycled and renewably produced label is audited and certified by an independent third-party.

What are the processes used to make XCarb® recycled and renewably produced?

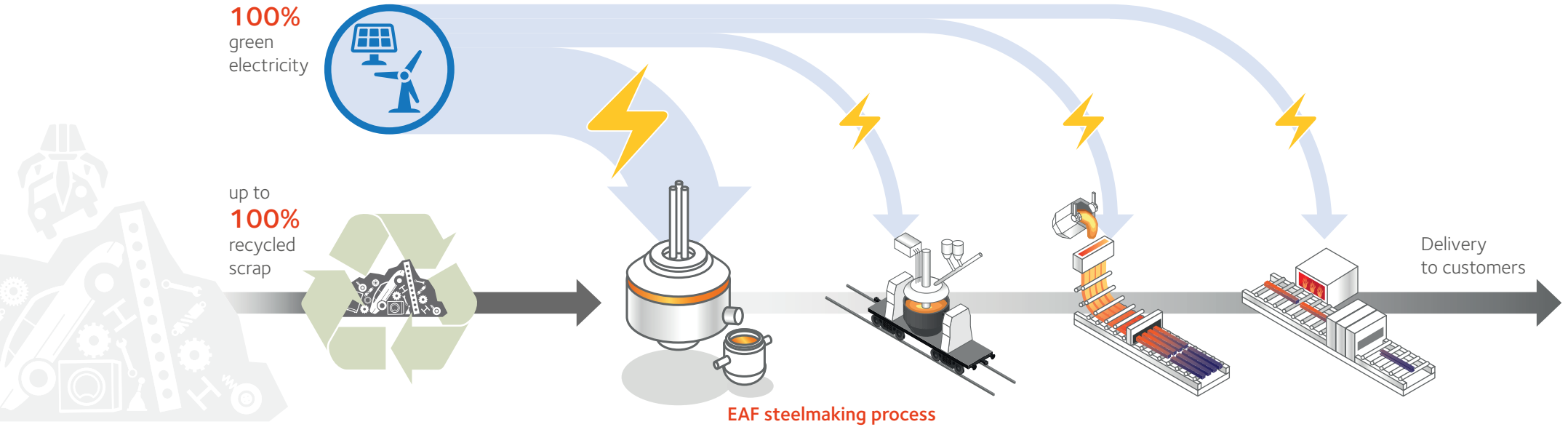
To produce XCarb® recycled and renewably produced steel, ArcelorMittal Europe – Long Products uses 100-percent scrap. All of the electricity needed to transform the scrap into XCarb® recycled and renewably produced steels comes from renewable sources such as solar and wind power. The energy is provided by suppliers who are connected to the same grid as our production sites and whose projects are recent.

The combination of recycled content and renewable energy allows ArcelorMittal Europe – Long Products to offer steels with very low levels of CO_2 emissions per tonne of finished steel. ArcelorMittal Europe – Long Products estimates that XCarb® recycled and renewably produced steel will have a CO_2 footprint as low as 0.3 per tonne of finished steel.

This is significantly lower than the average for the global steel industry which is around 2.3 tonnes of CO_2 emissions per tonne of steel products.[1]

Each tonne of steel produced under the XCarb™ recycled and renewably produced label will have its own production certificate. The certificate guarantees that only recycled steel was used in its production, and that the electrical energy used to make the steel came from renewable sources.

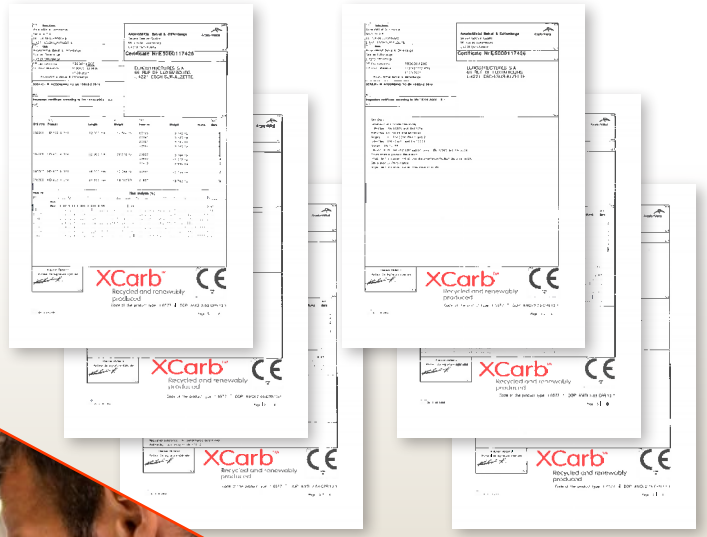
ArcelorMittal Europe – Long Products can also release an Environmental Product Declaration (EPD) for each product family produced under XCarb™ recycled and renewably produced conditions. The EPD will detail the complete environmental cost of the specific product range.



1. https://www.sustainablefinance.hsbc.com/-/media/gbm/sustainable/attachments/4016-hsbc-csf-steel-report-2019v5.pdf

The certification process

XCarb®
Recycled and renewably produced



Delivery of material documentation and certificate with XCarb® recycled and renewably produced

Follow-up of the order system audited by a third party

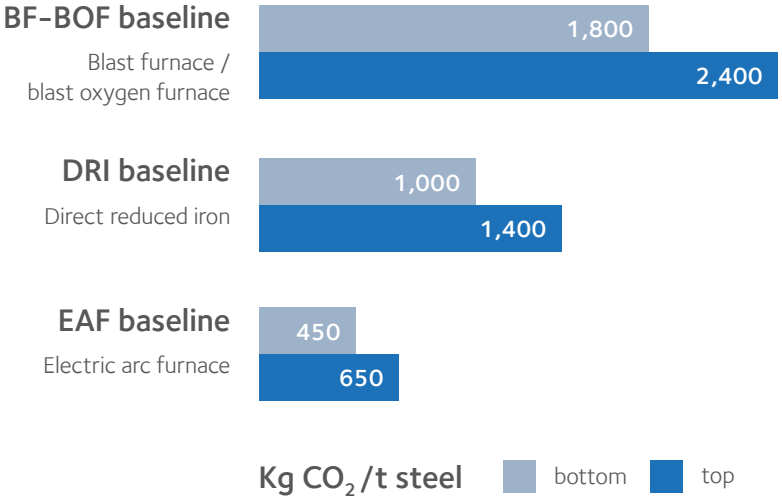
Delivery of the final product to the customers

Purchase of renewable electricity via "Guarantee of Origin" European System

CO_2 intensity of XCarb® recycled and renewably produced

ArcelorMittal Europe – Long Products estimates that XCarb® recycled and renewably produced steel can have a CO_2 footprint as low as 0.3 per tonne of finished steel when the metallics are 100% scrap.

This is significantly lower than the average for the global steel industry which is around 2.3 tonnes of CO_2 emissions per tonne of steel products.[1]



1. https://www.sustainablefinance.hsbc.com/-/media/gbm/sustainable/attachments/4016-hsbc-csf-steel-report-2019v5.pdf

What are the advantages for ArcelorMittal's customers?

Purchasing our XCarb® recycled and renewably produced steel allows you to reduce the global CO_2 footprint of your projects, products, and finished goods. To calculate the total CO_2 impact of your products, our customers can use the figures reported in the EPD: they are independently certified by a third-party.

How do we guarantee that XCarb® recycled and renewably produced steels are made using green electricity?

Steels with the XCarb® recycled and renewably produced label are audited and certified by an independent third-party. Each quarter, the auditor confirms that the steel complies with the two conditions (100-percent recycled steel and 100-percent green electricity) that enables them to receive the XCarb® recycled and renewably produced label.

"XCarb® Recycled and renewably produced initiative is a great way forward for the environment. Combining 100% recycled steel with 100% renewable electricity for the production of new steel products is clearly in line with the Cradle to Cradle-inspired goals for making a more sustainable world. It promotes recycling and the use of renewable electricity and furthermore will support long-term investments in this critical area of steel manufacturing."

William McDonough
Founder, William McDonough + Partners

Towards carbon-neutral steel

When could I get XCarb® recycled and renewably produced steel products?

XCarb® recycled and renewably produced steel can be purchased today.

We have embarked on a long journey to reduce our CO_2 footprint with the goal of becoming carbon-neutral by 2050. Further updates on our progress and our XCarb® product range will be made as that journey continues.

How could I find out more about XCarb®?

ArcelorMittal Europe – Long Products customers can contact their local support team for more information about XCarb® recycled and renewably produced steel.

You can also visit:
europe.arcelormittal.com/sustainability/xcarb/recycled_and_renewably_produced

At ArcelorMittal, sustainability is about more than carbon reduction

Our commitment to sustainable development

High standards of business ethics and governance have been fundamental at ArcelorMittal since the company was founded. We aim to treat our own people and our stakeholders with dignity and respect. We want to listen thoughtfully, learn from our experience, and lead by example.

In 2015, ArcelorMittal launched its sustainable development framework and identified 10 sustainable outcomes to prepare and respond to the most signifcant long-term environmental and social issues including health and safety, product innovation, the environment, climate change, customer reassurance, and social wellbeing.

We believe that our best way of contributing to the United Nations 17 Sustainable Development Goals (SDGs) is to pursue our 10 sustainable outcomes.

corporate.arcelormittal.com/sustainability/our-10-sd-outcomes

ArcelorMittal Climate Action Report

In 2021, ArcelorMittal published its second Climate Action Report. The document details how ArcelorMittal plans to reduce emissions in its European operations by 35 percent by 2030 – a key milestone towards reaching net zero by 2050.

The Report elaborates on the ground-breaking work underway to achieve our carbon-neutral steelmaking objectives. To transform our operations to become carbon neutral, we need to move primary (iron ore-based) steel production away from a reliance on fossil fuel energy and towards the use of 'clean energy' – in the form of clean electricity, circular carbon, and carbon capture and storage (CCS).

corporate.arcelormittal.com/sustainability/climate-action-reports

In 2020, ArcelorMittal was recognised by CDP for our strong performance on corporate transparency and action on climate change. Once again, we maintained our A- score in the CDP's climate change assessment. This puts ArcelorMittal in the top 10 percent of the steel industry and within the top quartile of all metal smelting, refining, and forming companies.

Steel has been recognised by the European Union as a permanent material. This designation recognises that steel can be infinitely recycled without loss of quality, no matter how many times it is recycled.

ArcelorMittal is a founding member of ResponsibleSteel™ – the steel industry's first global multi-stakeholder standard and certification initiative.

The initiative includes members from every stage of the steel supply chain. ResponsibleSteel™ has developed an independent certification standard and programme via a process that aims to align with the ISEAL codes of good practice.

More info:
responsiblesteel.org

ArcelorMittal

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Embodied carbon in construction case studies

Embodied carbon in construction case studies

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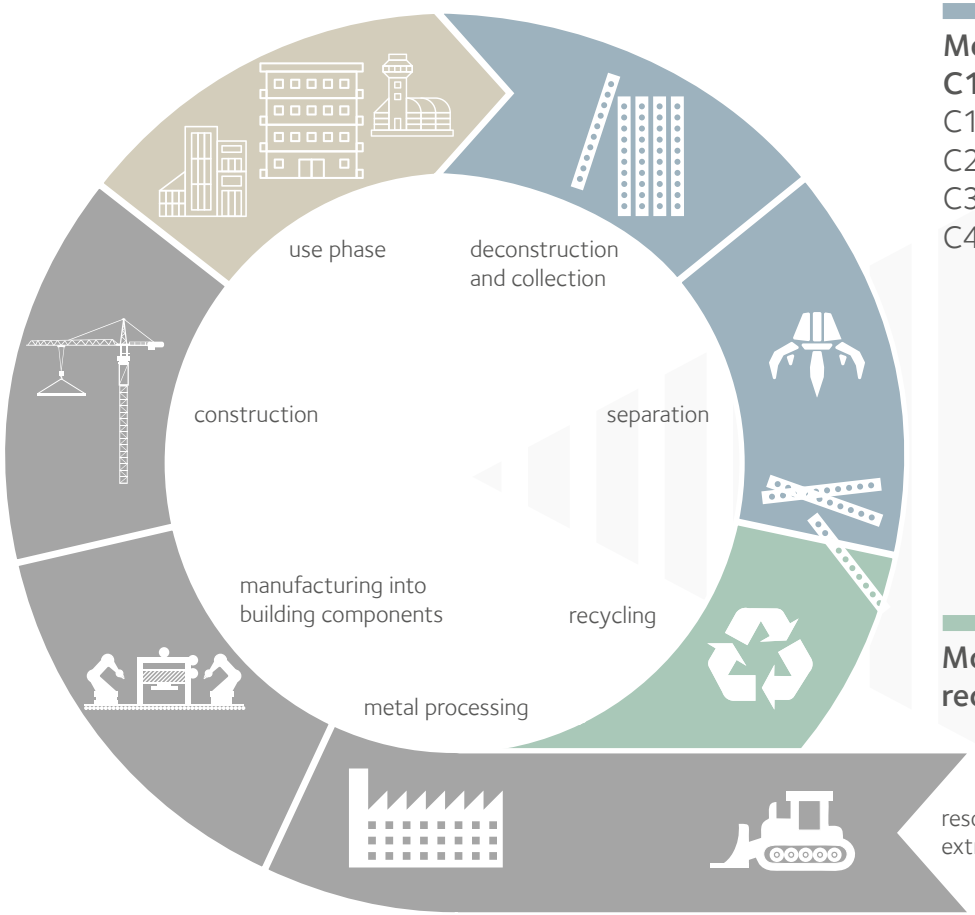

Module C
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C1: de-construction
C2: transport
C3: waste processing
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Module A
A1-A3: product stage
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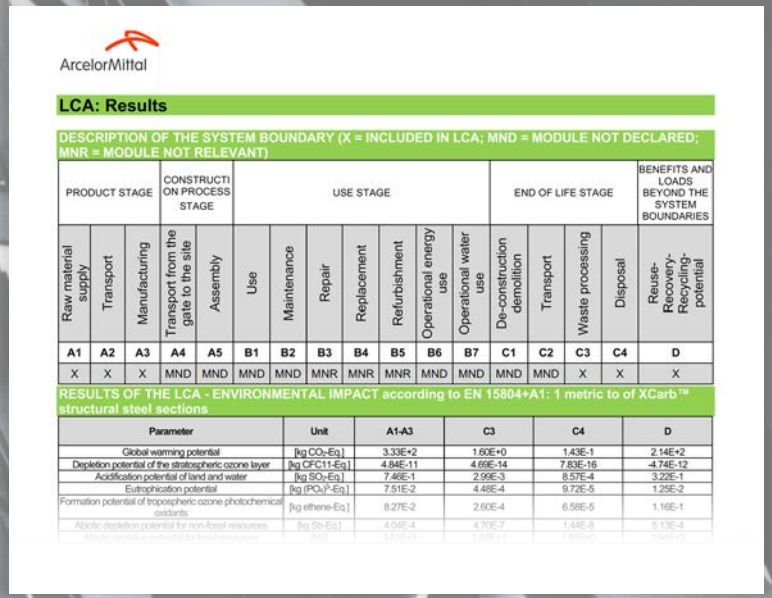

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LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MNR	MNR	MNR	MND	MND	MND	MND	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A1: 1 metric to of XCarb™ structural steel sections

Parameter	Unit	A1-A3	C3	C4	D
Global warming potential	[kg CO_2-Eq.]	3.33E+2	1.60E+0	1.43E-1	2.14E+2
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	4.84E-11	4.69E-14	7.83E-16	-4.74E-12
Acidification potential of land and water	[kg SO_2-Eq.]	7.46E-1	2.99E-3	8.57E-4	3.22E-1
Eutrophication potential	[kg $(PO_4)^3$-Eq.]	7.51E-2	4.48E-4	9.72E-5	1.25E-2
Formation potential of tropospheric ozone photochemical oxidants	[kg ethene-Eq.]	8.27E-2	2.60E-4	6.58E-5	1.16E-1
Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	4.04E-4	4.70E-7	1.44E-8	5.13E-4
Abiotic depletion potential for fossil resources	[MJ]	3.81E+3	1.82E+1	1.99E+0	1.94E+3

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Embodied carbon by life cycle stage: the XCarb® recycled and renewably produced EPD (environmental product declaration) for sections and merchant bars

The environmental product declaration (EPD) can be used to compare the low footprint of XCarb® recycled and renewably produced steel with any other alternatives.

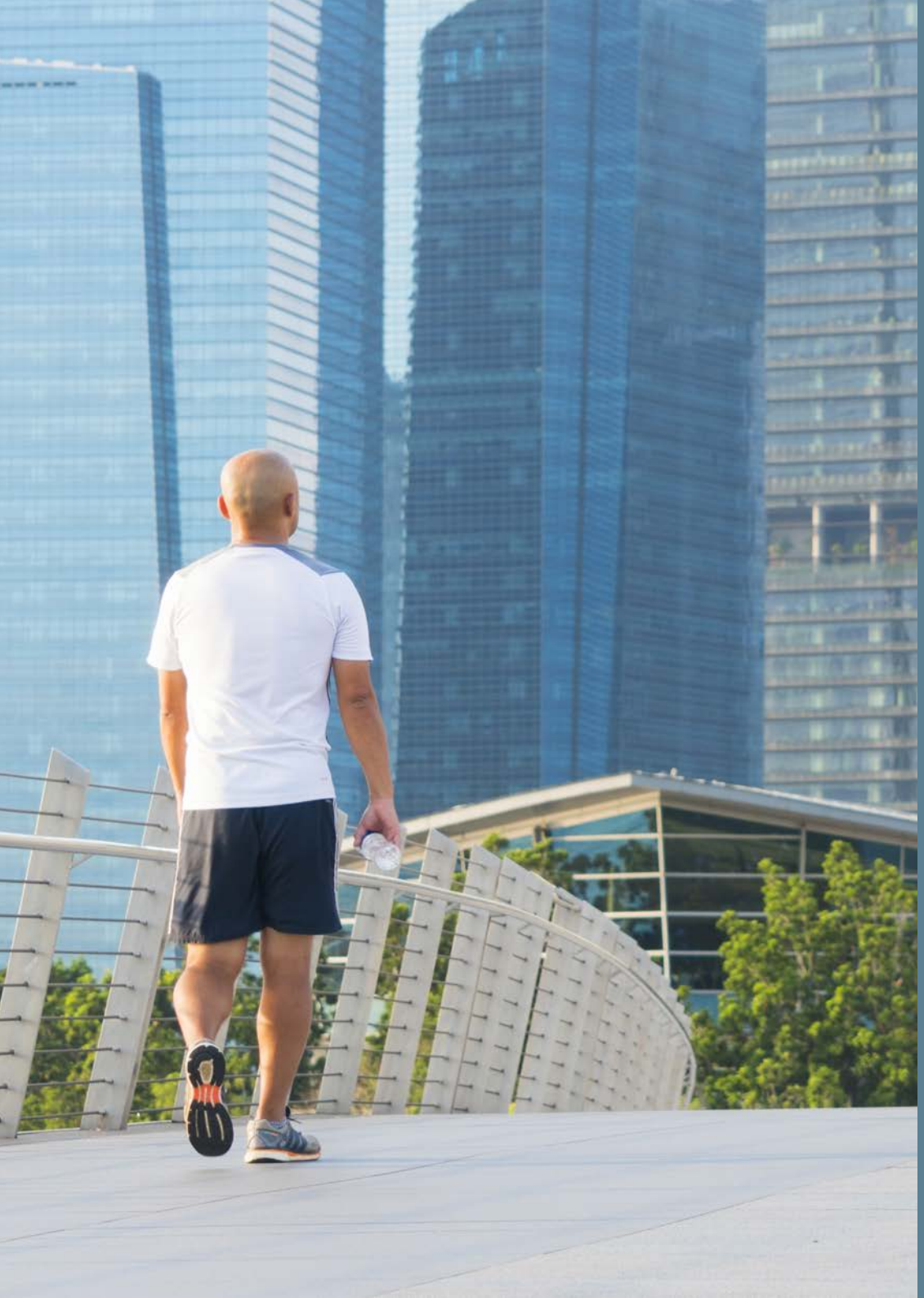
Global warming potential (GWP) in kg CO_2/tonne

Modules A1–A3 (product stage): 333 kg CO_2/t

Module C3 (waste processing): 1,6 kg CO_2/t

Module C4 (disposal): 0,1 kg CO_2/t

Module D (recycling): 214 kg CO_2/t



Embodied carbon in construction case studies

"By 2030, all new buildings, infrastructure and renovations will have at least 40% less embodied carbon with significant upfront carbon reduction, and all new buildings must be net zero operational carbon.

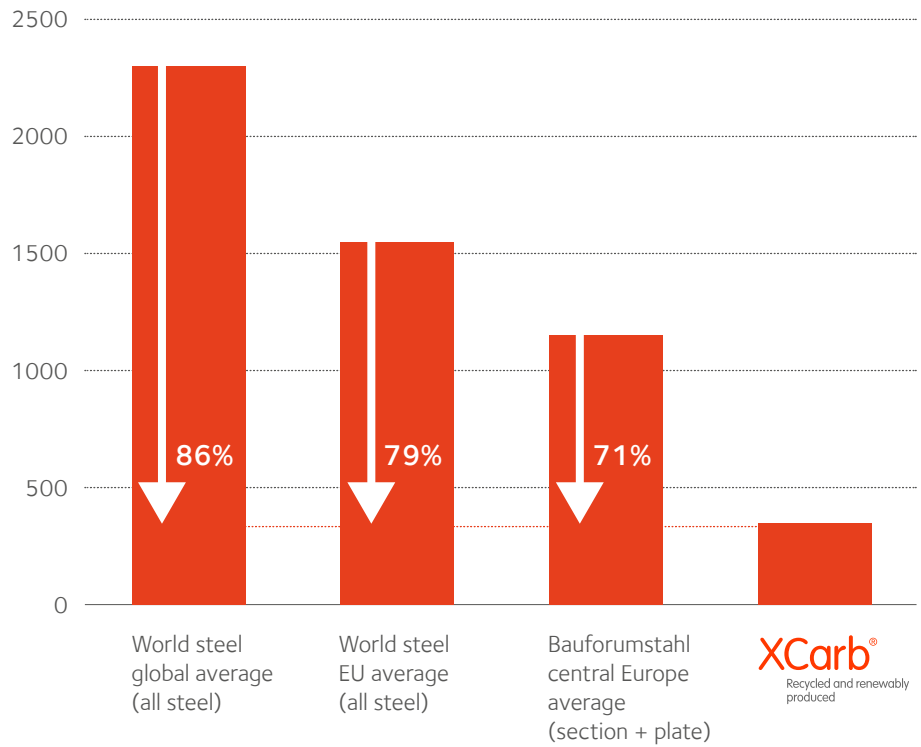
By 2050, new buildings, infrastructure and renovations will have net zero embodied carbon, and all buildings, including existing buildings, must be net zero operational carbon."

World Green Building Council
extract from
Bringing embodied carbon upfront

WORLD GREEN BUILDING COUNCIL

Case study: structural steel sections, depending on the manufacturing process, have different embodied carbon factors

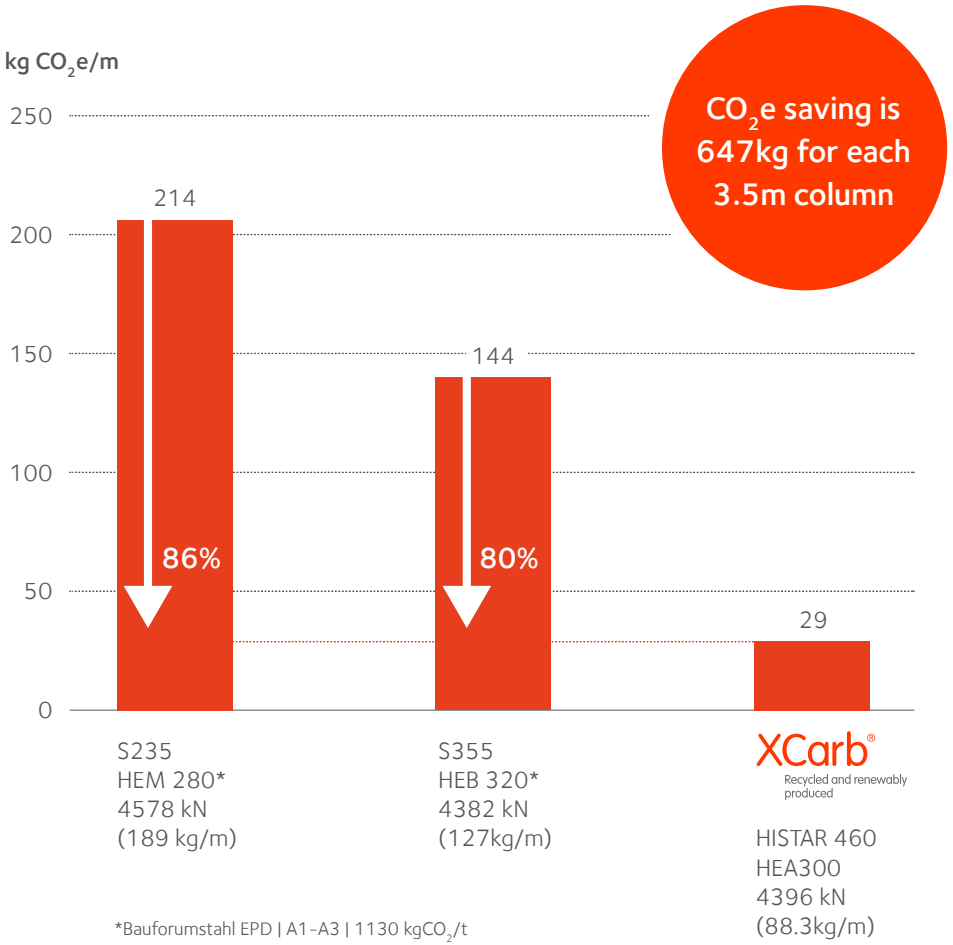
Kg CO_2e per tonne of rolled section (A1-A3)



Intelligent material selection makes all the difference

Case study: column in multi-storey building

Multi-storey column subject to axial load buckling length 3.5m

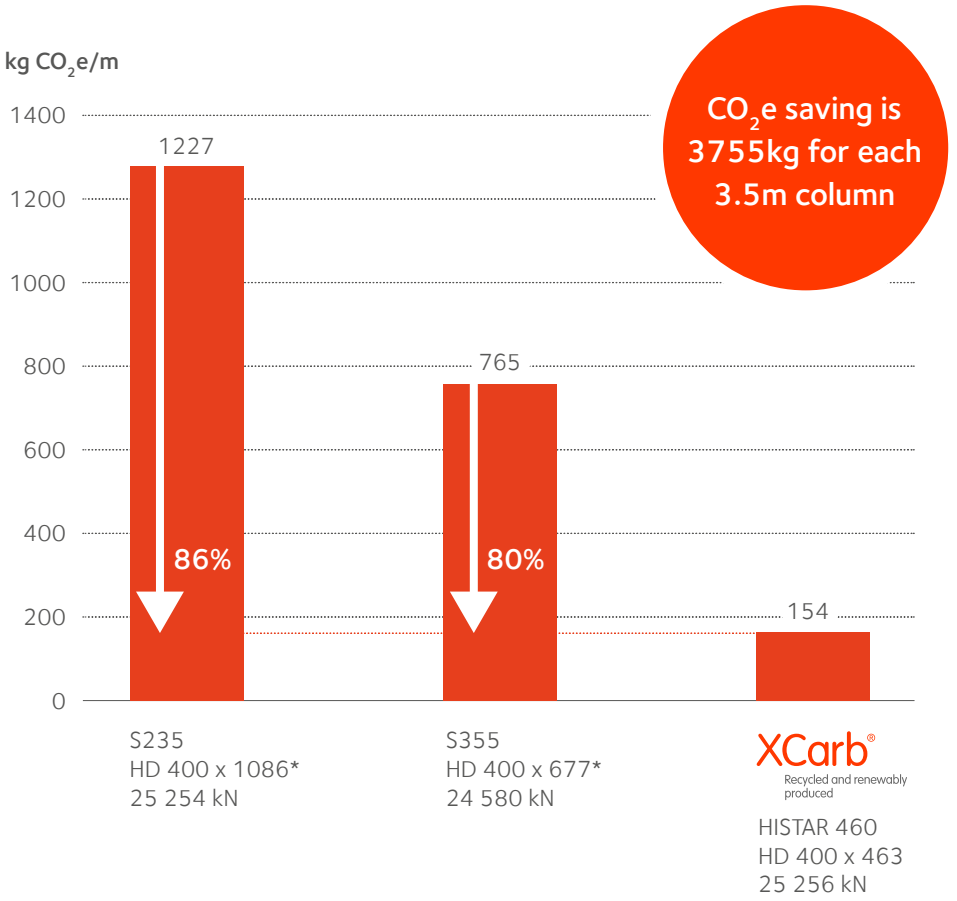


*Bauforumstahl EPD | A1-A3 | 1130 kgCO_2/t

Intelligent material selection makes all the difference

Case study: column in high rise construction

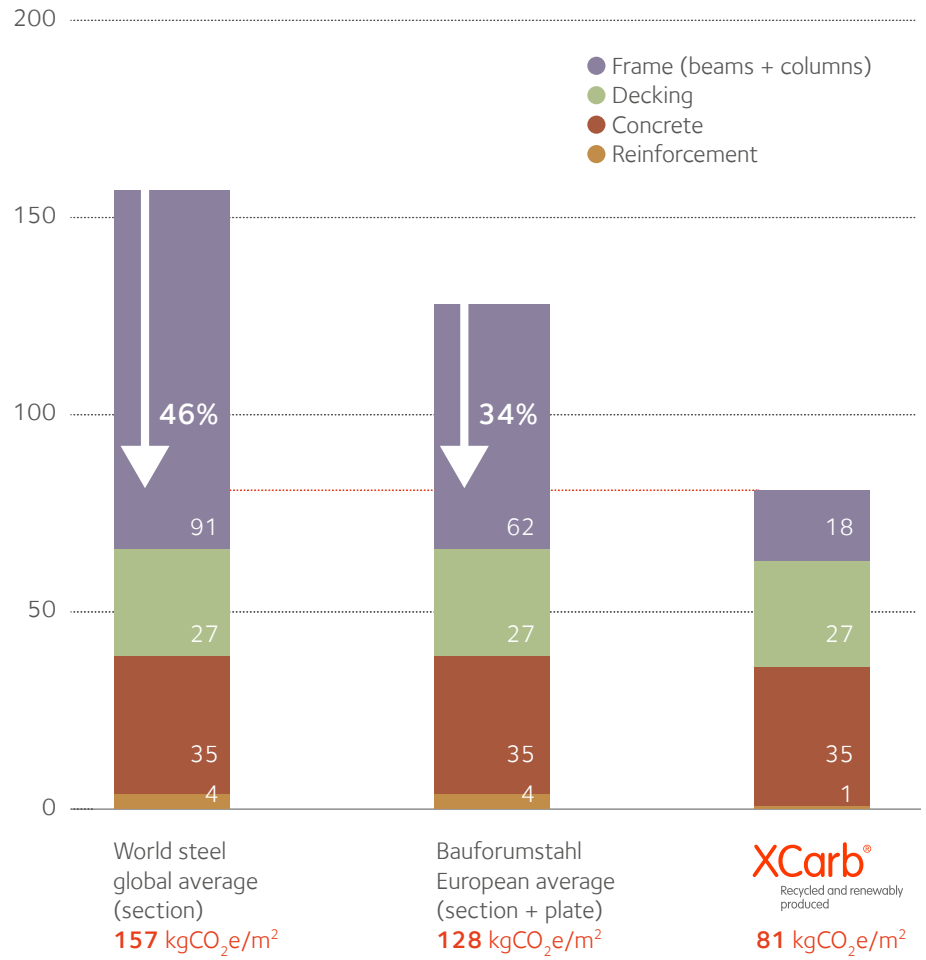
Multi-storey column subject to axial load buckling length 3.5m



*Bauforumstahl EPD | A1-A3 | 1130 kgCO_2/t

Case study: XCarb® recycled and renewably produced – the perfect partner for low carbon embodied composite floors

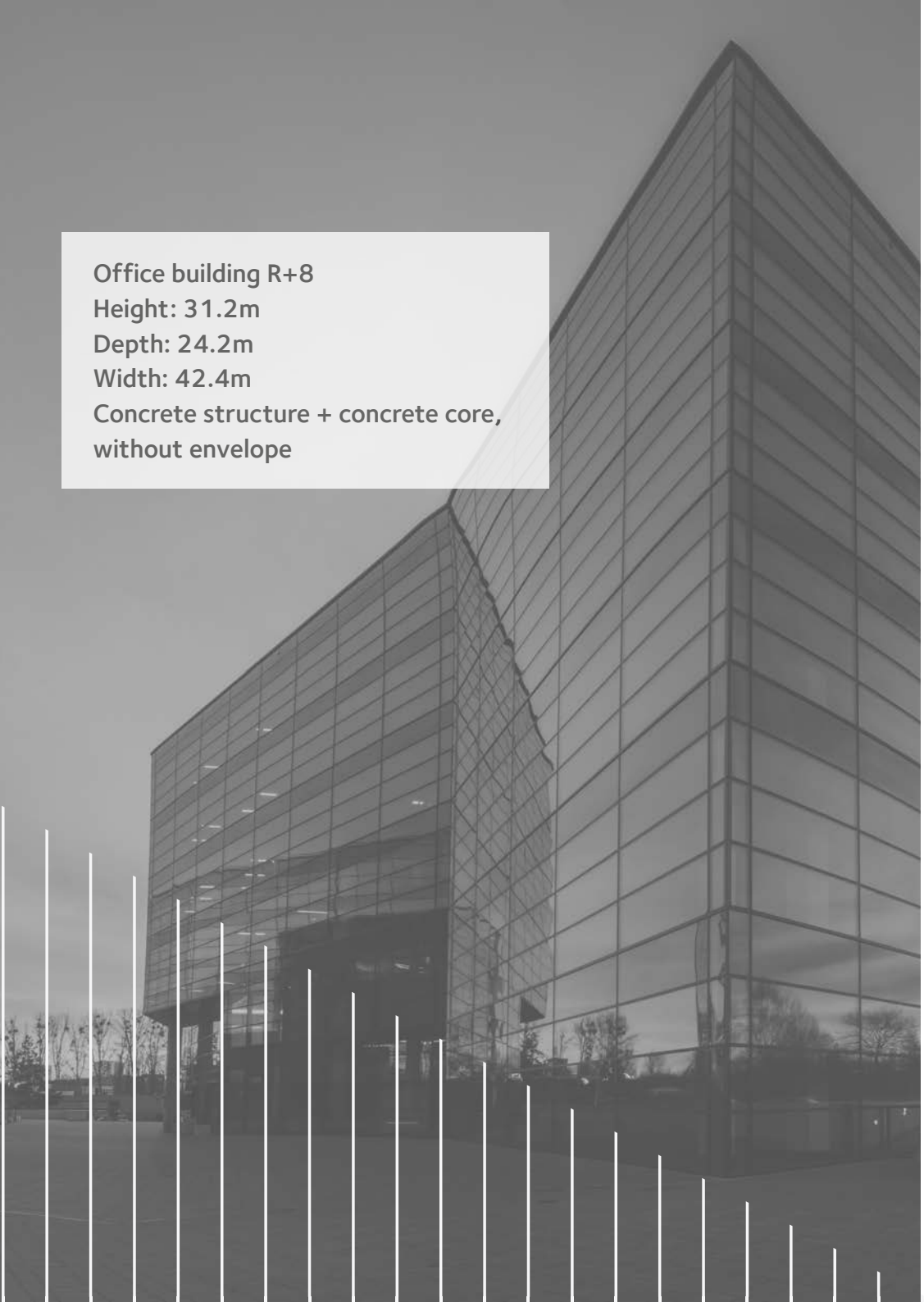
Frame and floors [A1-A3]
kg CO_2e/m^2



Case study: embodied carbon in construction – Industrial building, LVS3*

Module A – Concrete vs. Steel S235 vs Steel S460

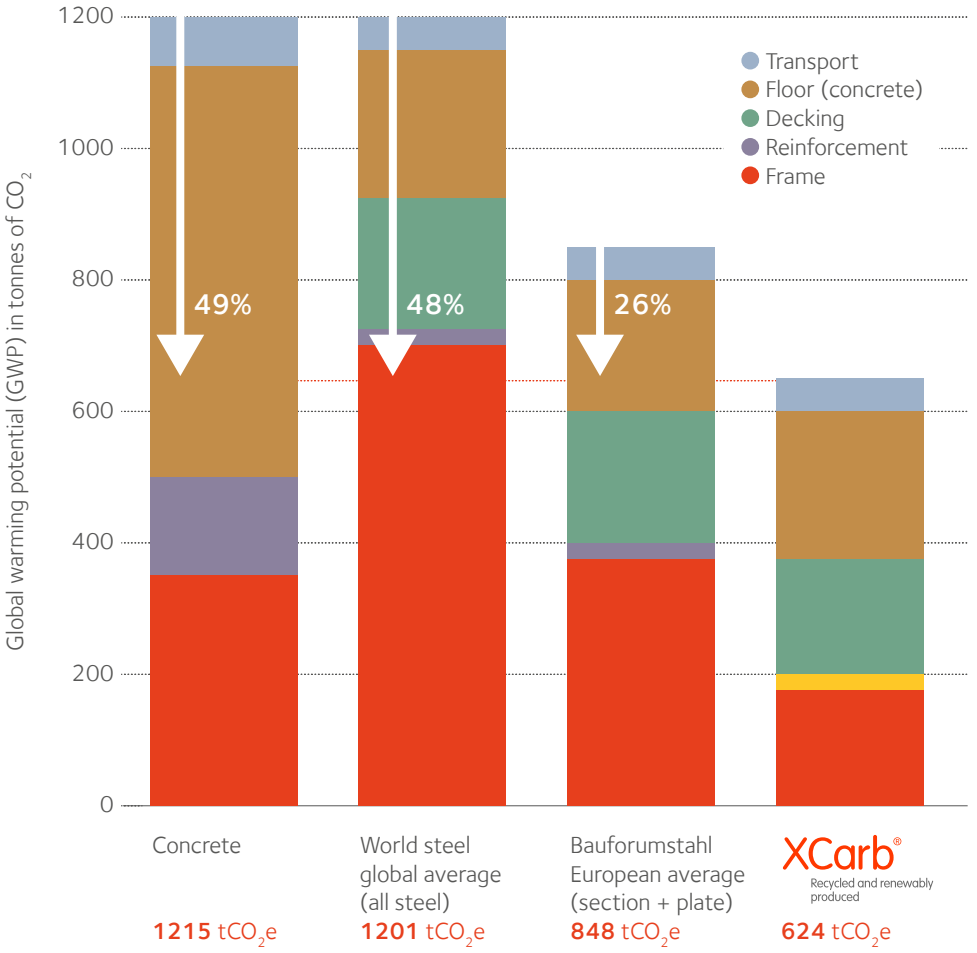
*LVS3 European project: https://op.europa.eu/en/publication-detail/-/publication/cbb3472d-fbbe-11e5-b713-01aa75ed71a1



Office building R+8
Height: 31.2m
Depth: 24.2m
Width: 42.4m
Concrete structure + concrete core, without envelope

Case study: embodied carbon in construction – Office building, LVS3*

Module A – Concrete vs. S460 Steel



*LVS3 European project:
https://op.europa.eu/en/publication-detail/-/publication/cbb3472d-fbbe-11e5-b713-01aa75ed71a1

The intelligent construction choice

Steligence®

Built into the holistic Steligence® approach is a broad range of thinner, lighter, and high-performance steel solutions.

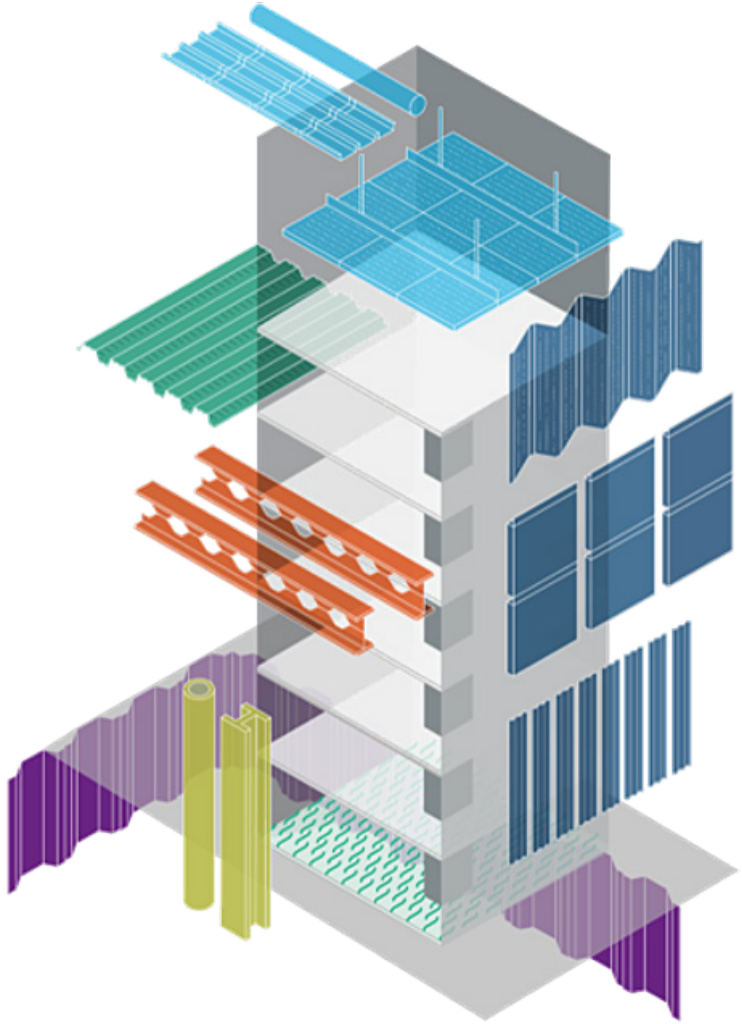
Amongst those solutions, the use of high strength steel sections allows a complete building optimisation and has the potential to reduce the embedded carbon footprint of a building by 54 percent while enhancing the flexibility and economics of the structure.

Considering the share of global emissions from the built environment, the impact of such improvement could be very significant.

steligence.arcelormittal.com

The intelligent construction choice

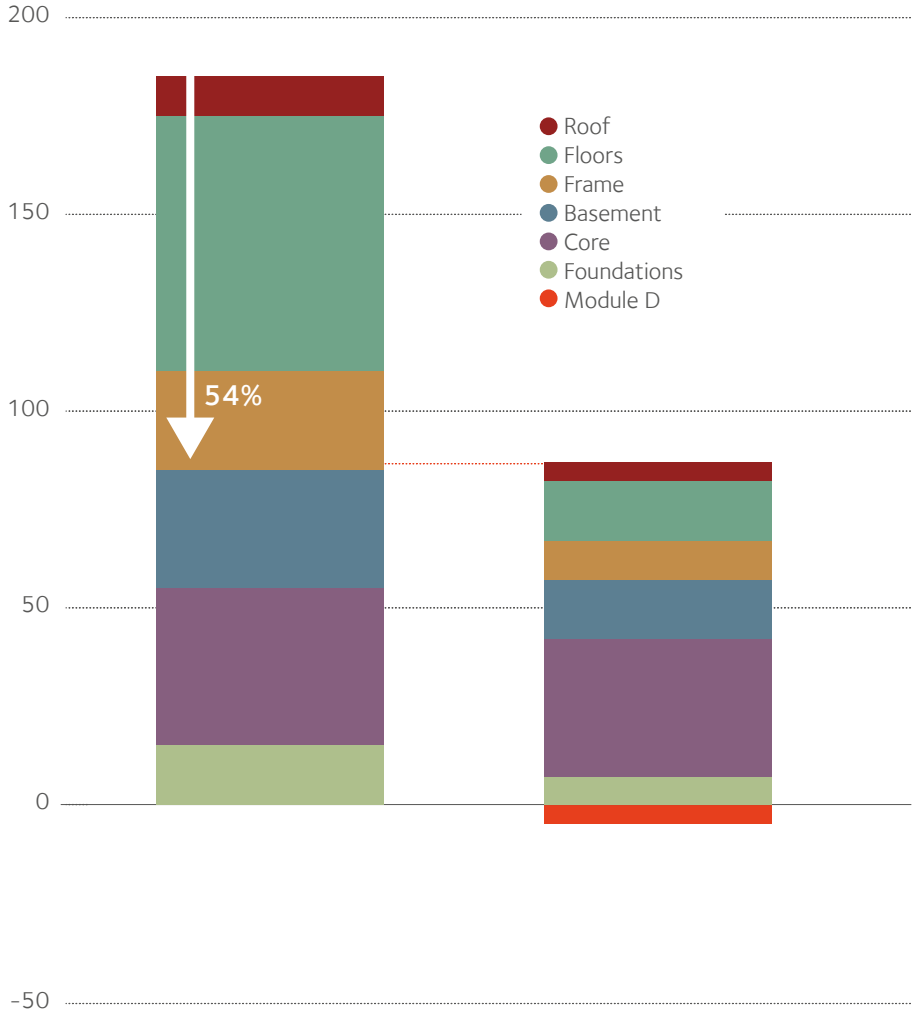
Steligence®



Case study: embodied carbon in construction – The Steligence® office building

Cradle to cradle | A-C + D

kg CO_2e/m^2



182 $kgCO_2e/m^2$

"Best in class" steel

83 $kgCO_2e/m^2$

ArcelorMittal

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Brochure XCarb® recycled and renewably produced – Sections and merchant bars Published by ArcelorMittal Europe – Long Products – 08/2021