



Not just any rebar  
**it's CARES  
certified  
rebar**

Not all rebar is created equal. Our app provides instant product provenance. So you can be sure the quality and safety standard you specify is what is delivered.

**That is why you should specify CARES certified - not just any rebar**

Assured Steel Certification  
Independent | Impartial | Trusted



[carescertification.com](https://carescertification.com)



**Assured Steel Certification**

**Independent | Impartial | Trusted**

August 2024

# Contents

- Activities and Organization
- The challenge
- The solution - Digitalisation




# Contents

- **CARES** Activities and Organization
- Product Conformity Assessment Model (*Upstream & Downstream*)
- The Solution: Digital Ecosystem & Digital Passport
- UAE Steel Regulation
- Green Procurement



# Activities and organisation

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# CARES - Assured steel certification

- CARES certification provides confidence to the users, purchasers and specifiers of steels through a regime of third party
- Regulation, testing and inspection
- Independent, not for profit certification body, established in 1983
- Provide accredited product certification schemes primarily for constructional steels

## ***Assurance & Certification Services:***

- Product Certification
- Management System Certification
- Technical Approvals
- Post Tensioning
- UKCA/UKNI
- Sustainable Constructional Steels Scheme
- BES 6001 Responsible Sourcing Certification
- ResponsibleSteel Certification
- Environmental Product Declaration to EN 15804 (3rd party verified EPD Report)
- Product carbon foot-printing (CF Report)



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The image shows the CARES logo, which is a red gear-like shape with a blue center containing the word "CARES".

# CARES assured services offered

## **“Digitally-enabled” Product Conformity Certification**

- Reinforcing steel – BS 4449, ASTM A615(M)/A706(M), BS 6744, SS560, CS2, ISO6935 plus others
- Reinforcing steel fabrication “downstream” – BS 4482 & BS 8666 & BS 4483 (fabric), ASTM A 496 / A497M, & SASO SA223 & SASO ASTM A615/ A615M (cut/bend),
- Pre-stressing wire and strand – BS 5896 plus others
- Welding of Reinforcing steel – BS8548 / BS EN ISO 17660
- Approval of PT Installation for Highway Structures
- Approval of PT Installation for non - Highway Structures

## **Technical Approvals (TA)**

- European Technical Approval of PT kit to EAD 160004
- Coupler approval (*TA1-A to UK Highways Design Manual, TA1-B to BS8597 and TA1-C to Sellafield Nuclear Specification*)
- Reinforcement Continuity Systems to CARES TA2
- Stud shear Reinforcing Systems to CARES TA7
- Pile Cage Connection Systems to CARES TA15

## **Sustainability Certifications**

- Sustainable Construction Steel (SCS) Certification (Sector certification scheme UKAS accredited to BS 8902)
- BES 6001 Responsible Sourcing Certification
- **ResponsibleSteel (RS) Certification**
- **Environmental Product Declaration to EN 15804 (3rd party verified EPD Report)**
- Product carbon foot-printing (CF Report)

## **UKCA/UKNI**

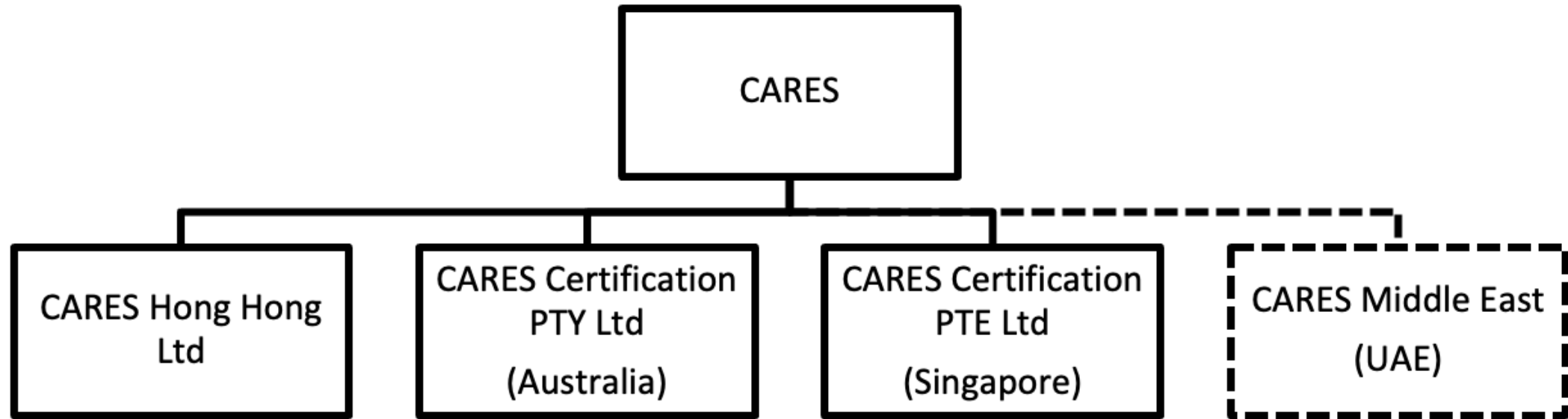
- Structural steel sections to EN 10025:2004
- Constructional flat steel to EN 10025:2004
- Stainless Steel to EN10088-5:2009
- Pre-cast Concrete to various harmonized standards

## **Management Systems Certification**

- Quality Management systems to ISO 9001:2015
- Environmental Management systems to ISO 14001:2015
- Occupational Health and Safety Management systems to ISO 45001:2018

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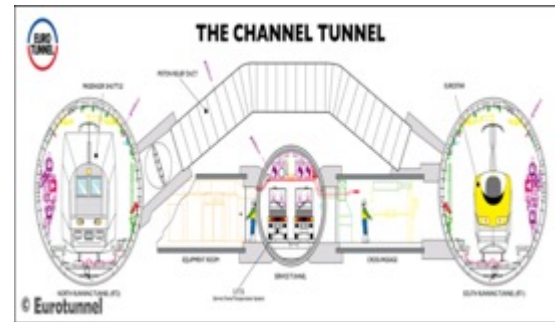
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# Major projects and recognitions




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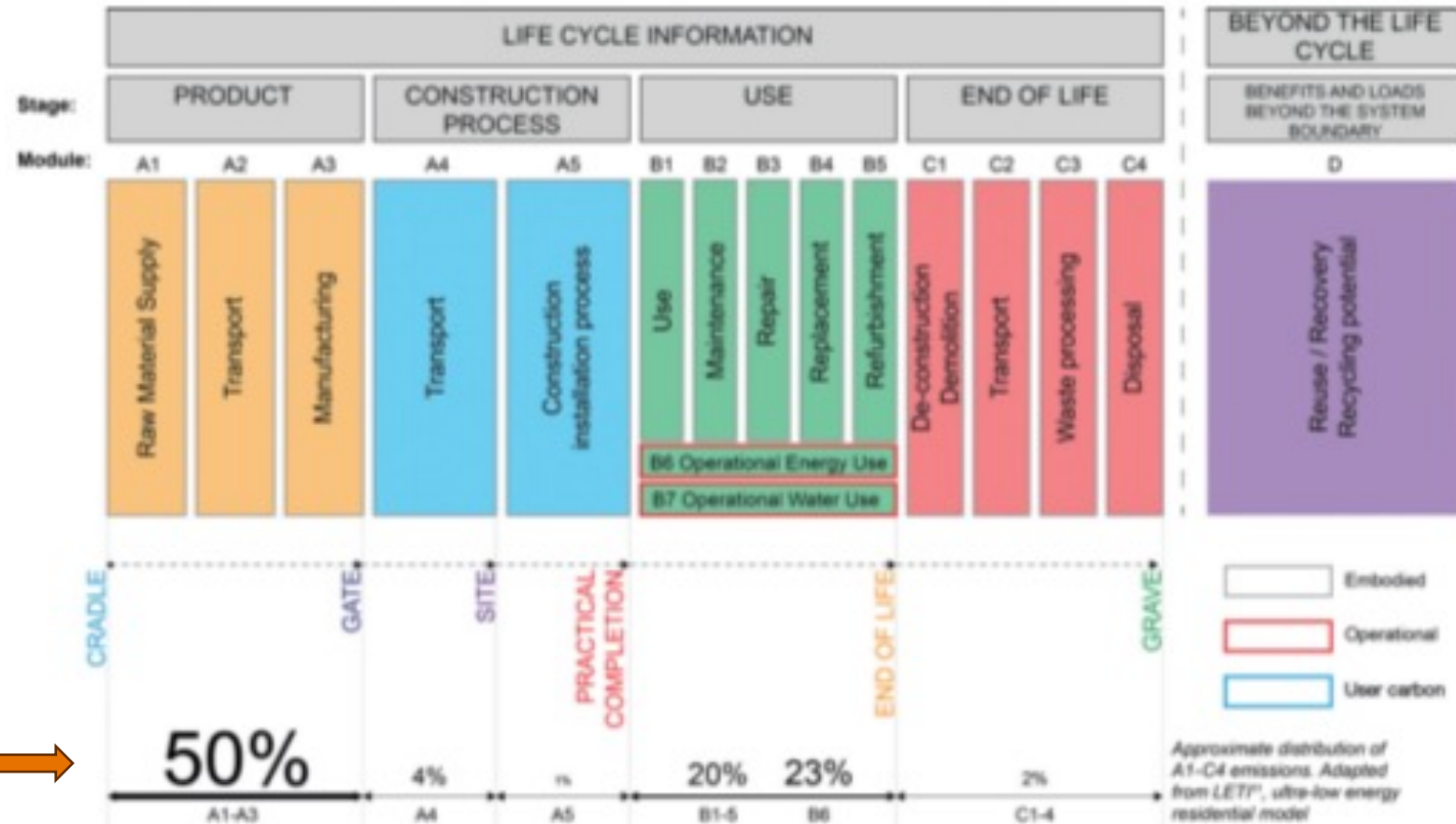
# The challenge

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# Challenge - Constructional steel GHG emissions

- Steel production is estimated to be responsible for 7- 9% of global warming emissions, according to the World Steel Association (**worldsteel**)
- **worldsteel** also estimates that out of a global steel production of 1,951 million tonnes in 2021, more than 50% was used in buildings and infrastructure
- Out of this about half is estimated to be reinforcing steel used in concrete reinforcement
- Materials (Product) determine ~ 50% of a building's emissions impact 



# Influencing factors in steel embodied emissions

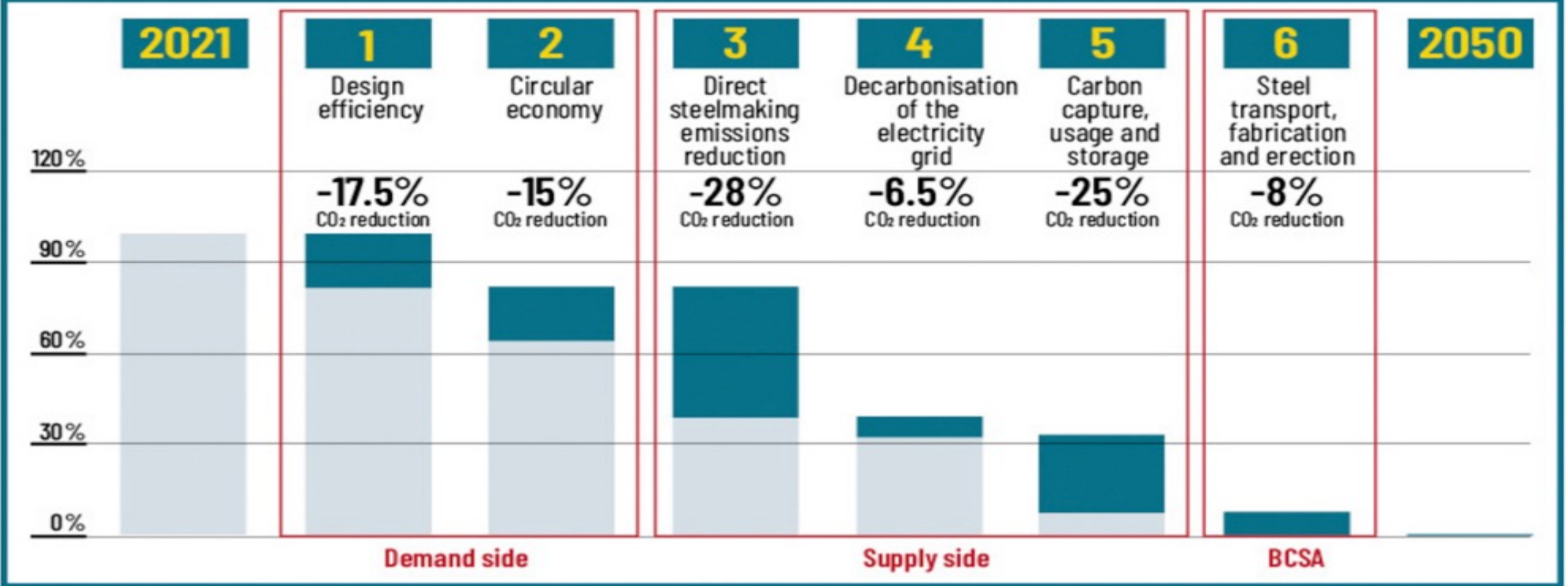
- **Production route:** There are 3 production routes
- **Product type:** Historically, in Europe, structural steels tended to be made by BF/BOF, rebar using EAF, stainless and special alloys using BF/BOF, which typically have even higher emissions
- **Domestic and regional production:** Be aware of domestic and regional steel manufacturing process routes, regional trade patterns, and the associated carbon footprint of the steel supplied
- **Technology:** Process gas reuse and export, use of (green) hydrogen to reduce iron ore rather than coal, carbon capture, utilisation and storage (CCUS), electrolysis (in future)
- **Energy sources:** national grid factors for electricity (especially for EAF), use of renewables

# Carbon footprint / GWP figures by Steel Manufacturing Process

Steel Manufacturing Process	Recycled Content (%)	GWP (kg CO <sub>2e</sub> )/tonne carbon steel reinforcing bars manufactured	Production Route
		(A1-A3 Life Cycle Stages)	%
Scrap based Electric Arc Furnace (EAF) CARES Sector Average EPD (September 2023)	97.8	787	21
Direct Reduced Iron (DRI) based Electric Arc Furnace (EAF) CARES Sector Average of 5 producers	3 to 32	2,144	7
Blast Furnace (BF) / Basic Oxygen Furnace (BOF)	15 to 30	2,540	72

# BCSA decarbonisation roadmap: planned reductions 2021-2050

## Reduction Levers

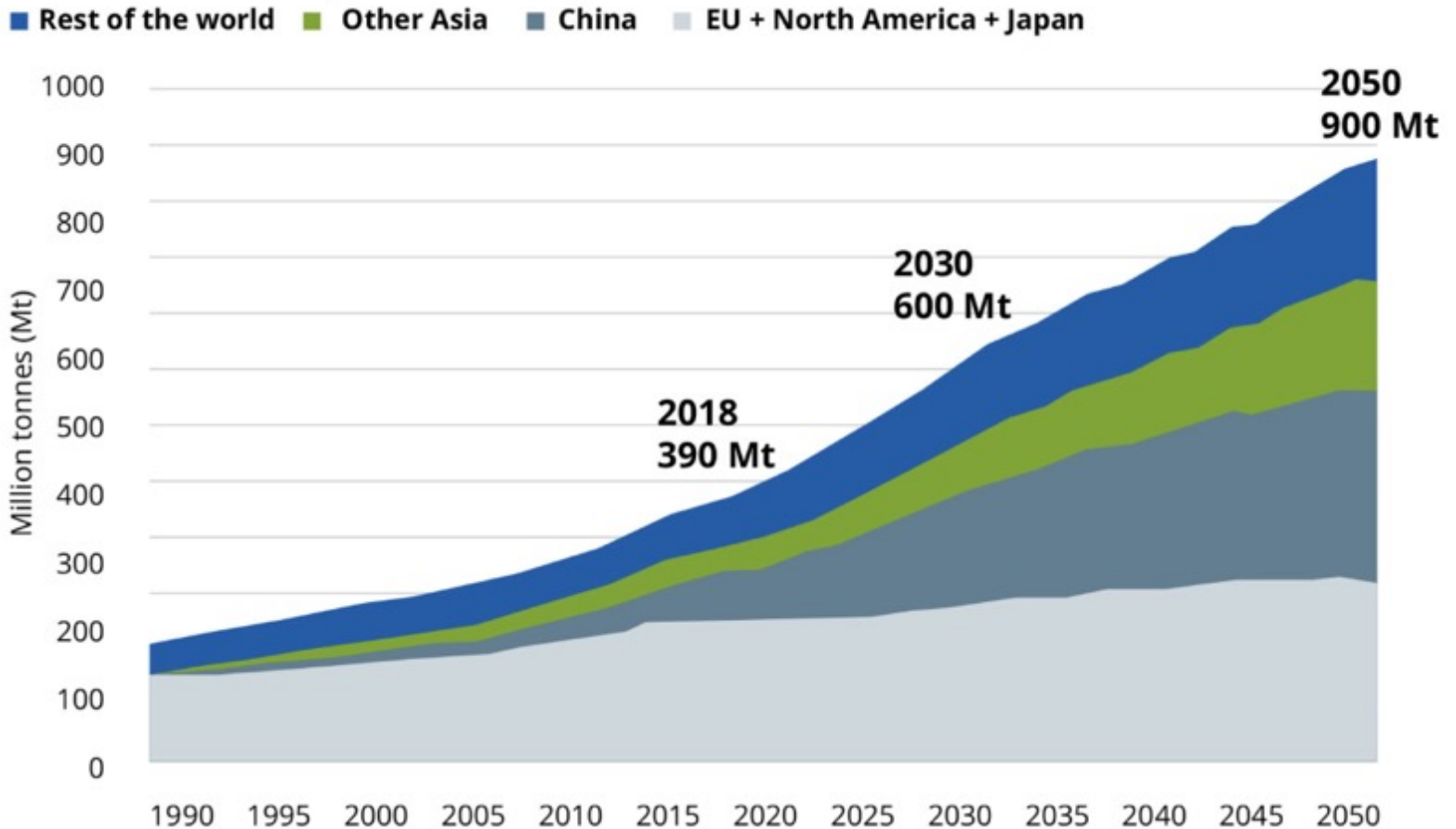


Source: British Constructional Steelwork Association, UK structural steelwork: 2050 decarbonisation roadmap

# Scrap availability

- Steel held in use (stocks) for up to 100 years+ before being released as scrap
- 650mt scrap used each year to make steel (manufacturing and EOL scrap)
- Limited temporal and geographical (EOL) scrap availability
- Implications on system (global) level, national and project level

## End-of-life scrap availability



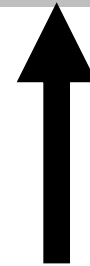
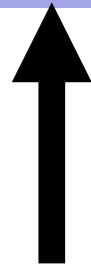
Source: worldsteel: <https://worldsteel.org/steel-topics/raw-materials/>

# The imperative

**Building safety**

**Net zero**


**Data and digital**





# What Consultants can do

## How to calculate embodied carbon – Design and tender stages



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# How to calculate embodied carbon

## Principles

We must:

- Achieve net zero carbon<sup>8</sup> before 2050 (with a 40% reduction in embodied carbon by 2030)
- Calculate embodied carbon<sup>†</sup> on all projects
- Recognise carbon as one component of sustainability
- Evaluate design decisions against their carbon impact
- Communicate carbon insights to the project team and client
- Advocate and engage the project team to find ways to reduce carbon impacts
- Report module-based<sup>††</sup> carbon data to an open-source database

Table 2.3: Suggested embodied carbon factors ( $ECF_{A1-A3,i}$ ) for common construction materials

Material	Type	Specification/details	Recommended default value	Typical lower bound	Typical upper bound	References		
						Default	Lower bound	Upper bound
Concrete	<i>In situ</i> concrete (unreinforced) <sup>a</sup>	UK C16/20	0.087 25% GGBS <sup>b</sup>	0.050 (70% GGBS)	0.113 (0% SCM <sup>b</sup> )	Ref. 19	Ref. 19	Ref. 19
		UK C20/25	0.093 25% GGBS <sup>b</sup>	0.053 (70% GGBS)	0.112 (0% SCM <sup>b</sup> )	Ref. 19	Ref. 19	Ref. 19
		UK C25/30	0.100 25% GGBS <sup>b</sup>	0.056 (70% GGBS)	0.119 (0% SCM <sup>b</sup> )	Ref. 19	Ref. 19	Ref. 19
		UK C32/40	0.120 25% GGBS <sup>b</sup>	0.063 (70% GGBS)	0.149 (0% SCM <sup>b</sup> )	Ref. 19	Ref. 19	Ref. 19
		UK C40/50	0.138 25% GGBS <sup>b</sup>	0.072 (70% GGBS)	0.159 (0% SCM <sup>b</sup> )	Ref. 19	Ref. 19	Ref. 19
		Global Average (excludes China) C32/40 <sup>c</sup>	0.175 <sup>d</sup> (mean)	0.139 <sup>d</sup> (20th percentile)	0.210 <sup>d</sup> (80th percentile)	Ref. 20	Ref. 20	Ref. 20
	Mortar/screed	1:4 cement:sand mix <sup>e</sup> with average UK cement mix <sup>f</sup>	0.149	-	-	Ref. 19	-	-
Precast concrete <sup>g</sup>	UK C40/50, unreinforced <sup>h</sup>	0.178 (Average UK cement mix)	0.090 (70% GGBS)	0.191 (0% SCM)	Ref. 19	Ref. 19	Ref. 19	
	UK 150mm reinforced hollow core slabs: British Precast Flooring Federation average	50.2 kgCO <sub>2</sub> e/m <sup>2</sup>	-	-	Ref. 21	-	-	
Steel	Reinforcement bars	UK CARES sector average (EAF production)	0.760	-	-	Ref. 22	-	-
		Global	1.960	0.395 (EAF production)	3.970 (BOF production)	Ref. 23	Ref. 24	Ref. 25
	PT strand	Assume the same as reinforcement bars	-	-	-	-	-	-
	Structural sections and plate	UK Rolled open sections	1.740 (consumption average)	0.567 (EAF production)	2.450 (BOF production)	Ref. 26	Ref. 27	Ref. 28
Global Rolled open sections		1.580			Ref. 23			

**1. RIBA Stage 1 to 3, Concept, Plan & Design:** initial embodied carbon analysis to determine carbon strategy in design. Use common construction materials averages at this stage


**2. Prior to tender:** analysis is updated and acts as a benchmark for the contractor to meet or improve

**3. As-Built:** it is important to monitor, measure and report, determining final overall embodied carbon of the construction materials to confirm whether set targets have been met

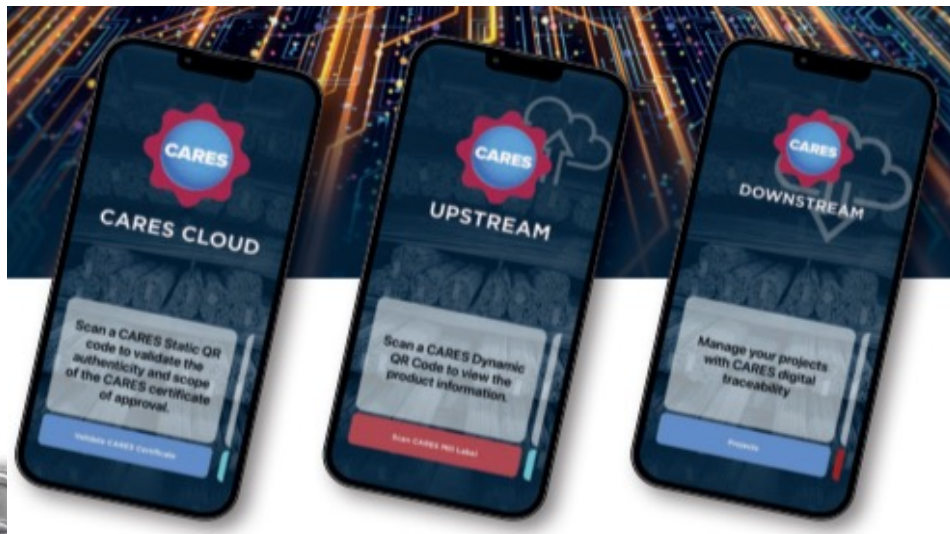
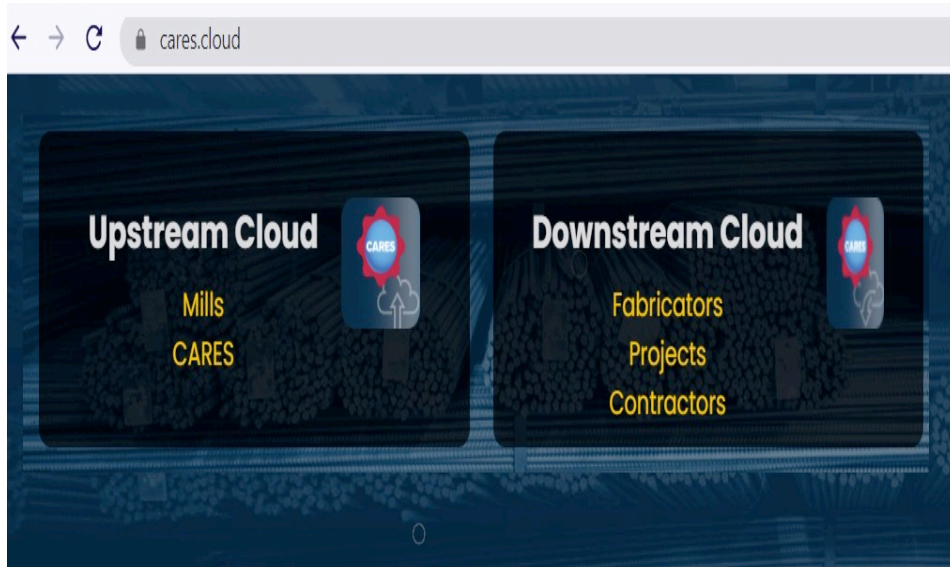


# The solution: Digitalisation

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# CARES Cloud



- ✓ The CARES Cloud is a digital ecosystem using a cloud-based platform and complementary Apps.
- ✓ The CARES Cloud enables Steelmakers to publish CARES Digital Records to the CARES Cloud.
- ✓ The CARES Digital Record contains the product information and the sustainability credentials, including the carbon footprint.

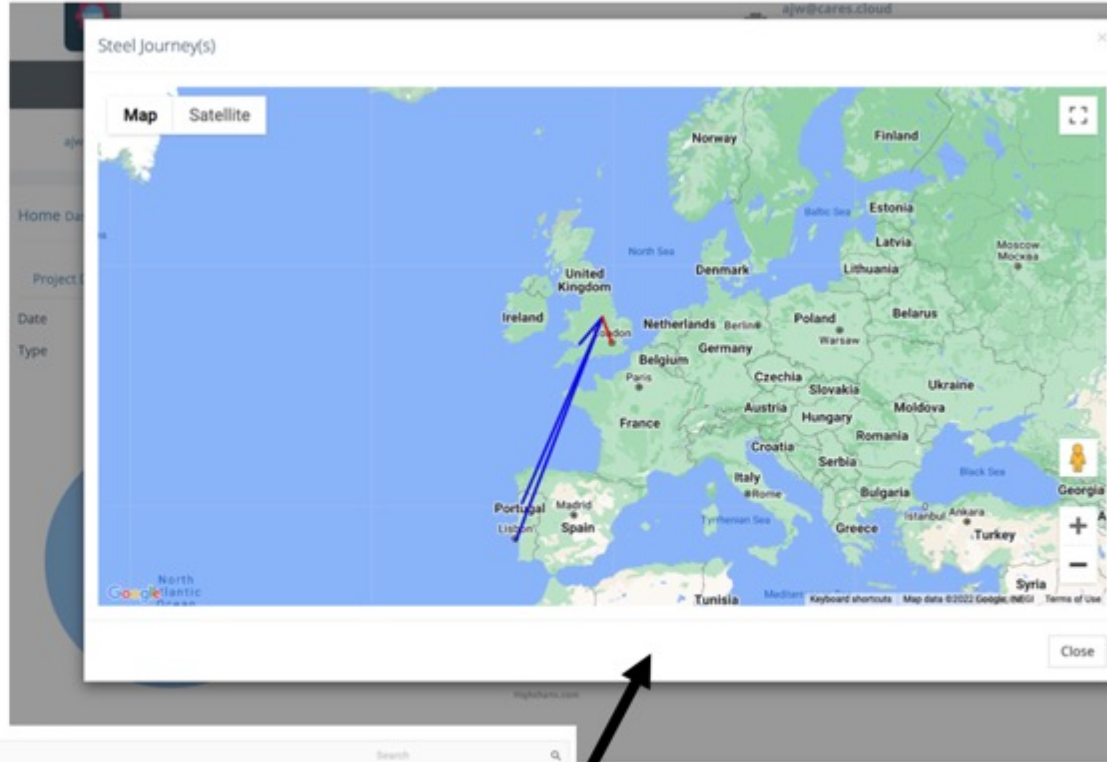
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# As-built embodied carbon

## Digital traceability from source to site

- Source of the rebar
- Rebar assurance evidence
- Environmental Product Declaration (EPD) including the Global Warming Potential (GWP)



Call off Reference	Reference	Company Name	Mills	Reference Date	AF	AM	AFM	CF	CM	CFM	Map
524	202104402	[Redacted]	3	22/10/2021	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**1. RIBA Stage 1 to 3, Concept, Plan & Design:** initial embodied carbon analysis to determine carbon strategy in design. Use common construction materials averages at this stage

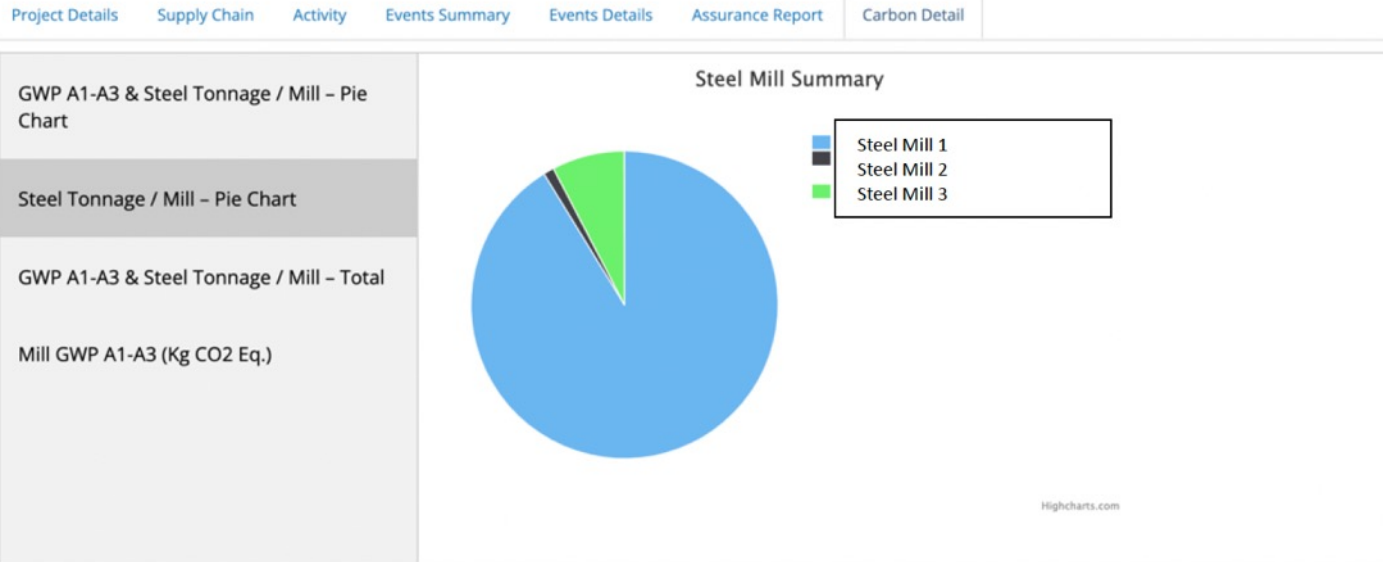
**2. Prior to tender:** analysis is updated and acts as a benchmark for the contractor to meet or improve

**3. As-Built:** it is important to monitor, measure and report, determining final overall embodied carbon of the construction materials to confirm whether set targets have been met

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# CARES Downstream Cloud - Project carbon calculation



- CARES Downstream Cloud enables the use of actual carbon footprint (GWP) data during the construction phase and overcomes many of the challenges identified by the industry.
- Carbon savings data can be quantified, based on the actual manufacturer of the reinforcement and quantities used.

## Carbon Summary

Print   Search

Mill Name	EPD Scheme	Weight (tonnes)	GWP A1-A3 (kg CO <sub>2</sub> Eq.)	Total GWP A1-A3 (kg CO <sub>2</sub> Eq.)
Steel Mill 1	BRE	289.649	647	187402.9
Steel Mill 2	CARES	3.555	438	1557.09
Steel Mill 3	CARES	24.318	655	15928.29
		Total:		Total:
		317.522		204,888.28

1 of 1 pages (3 items)

# Digital traceability delivers these benefits:

1. Traceability of the product from manufacturing source to site
2. Reliable, accurate, easily accessible carbon footprint information
3. **Accurate as-built carbon accounting** to deliver carbon footprint savings.



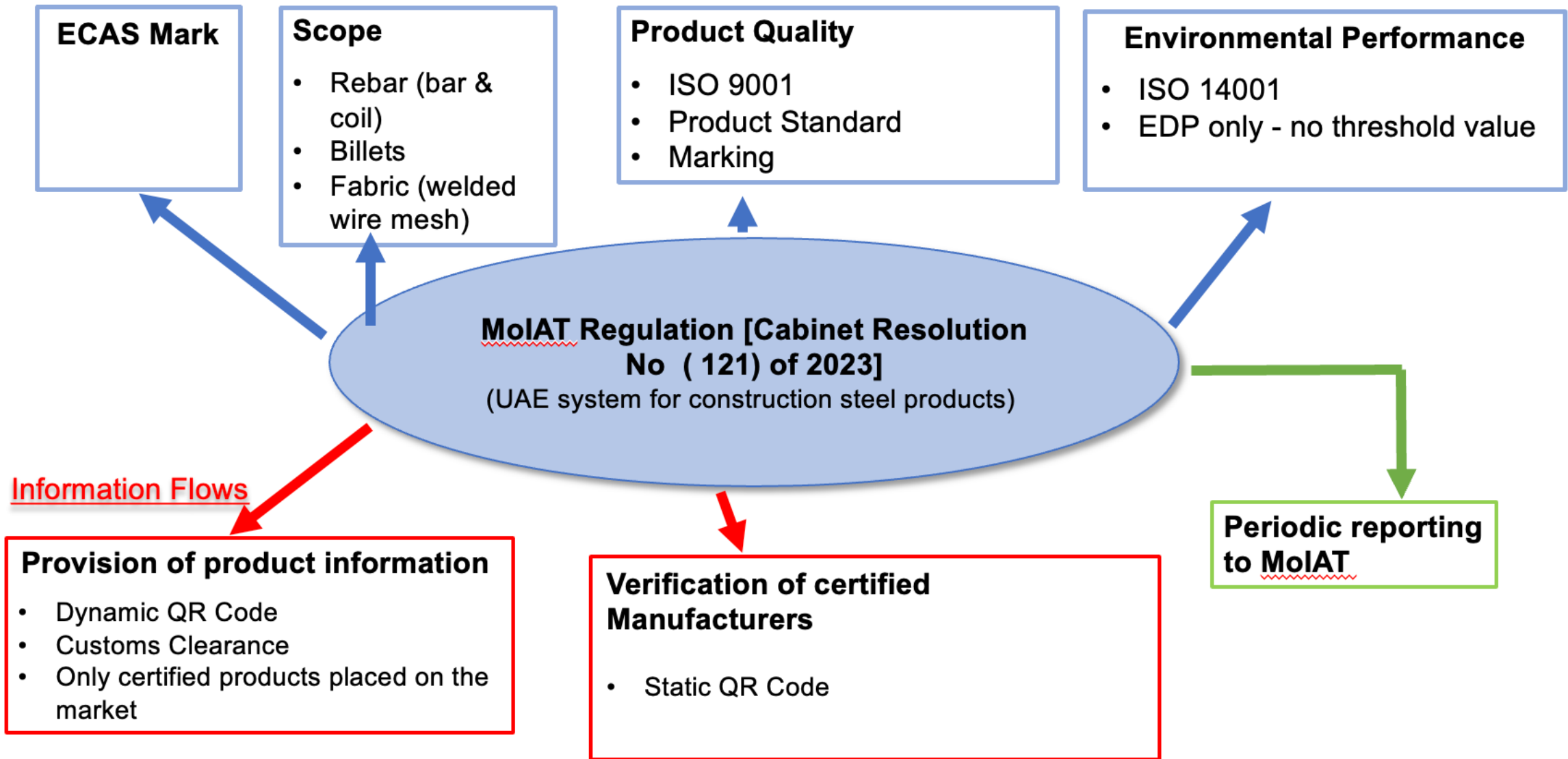
**UAE**

**Ministry of Industry and Advances  
Technology (MoIAT) Regulation**

**[Cabinet Resolution No (121) of 2023]  
(UAE system for construction steel products)**

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## **Cabinet Decision No. 121/2023**

### **On the UAE Scheme for Steel Bars for Concrete Reinforcement**

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<i>Type</i>	Law
<i>Issued on</i>	27 Nov 2023 (corresponding to 13 Jumada Al-Awwal 1445 H)
<i>Nature</i>	Cabinet Decision
<i>Jurisdiction</i>	United Arab Emirates

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Issue by us on: On: 13/Jumada Al-Awwal/1445 H.  
Corresponding to: 27/November/2023  
**Mohammed bin Rashed Al-Maktoom Prime Minister**

# Content

- **Article 1 - Definitions**
- **Article 2 - Scope of Application**
- **Article 3 - Obligations of the Applicant**
- **Article 4 - Technical and Operational Requirements**
- **Article 5 - Product Environmental Requirements**
- **Article 6 - Requirements for Obtaining the UAE Certificate of Conformity**
- **Article 7 - Emirates Conformity Assessment Scheme (ECAS) Mark**
- **Article 8 - General Provisions**
- **Article 9 - Violations and Penalties**
- **Article 10 - Grievance Procedure**
- **Article 11 - Adjustment of Situation**
- **Article 12 - Abrogation**
- **Article 13 - Publication and Entry into Force of the Decision**
  - *Annex No. 1 - Requirements for the Quality Management System*
  - *Annex No. 2 - Product Testing*
  - *Annex No. 3 - Reference Standard Specifications*

## Article 5 - Product Environmental Requirements

1- Manufacturers of carbon steel bars for concrete reinforcement and Billets fabricated for utilisation in the production of rebar and coils for concrete reinforcement are required to substantiate their conformity with *the ISO 14001 Environmental Management System (EMS)* through an independent and accredited certification entity.

2- Manufacturers of carbon steel bars for concrete reinforcement and Billets utilized in the production of rebar and coils for concrete reinforcement shall furnish an *Environmental Product Declaration (EPD)* in accordance with the standard (EN 15804), certified by an independent entity.

# Annex No. 1 - Requirements for the Quality Management System

- **Section D- Quality Control and Operations**

- Clause 13: Testing, inspection, and all pertinent records shall align with the requirements specified in the Product specifications and Customer demands. Specific methods for transmitting the required test information to Customers shall be in place. Additionally, Product test information shall be electronically transferred to a **cloud** platform maintained by the Designated Authority, using a data transfer protocol provided by the Designated Authority, within twenty-four (24) hours from the time the Product is released to the Customer.

# Static QR code

The static QR code, shall as a minimum, provide secure access to the following data maintained by the Notified Body:

- The name of the manufacturer
- The place of manufacture of the product
- The scope of approval of the manufacturer
- The date of expiry of the certificate of conformity
- The name and/or number of the Notified Body

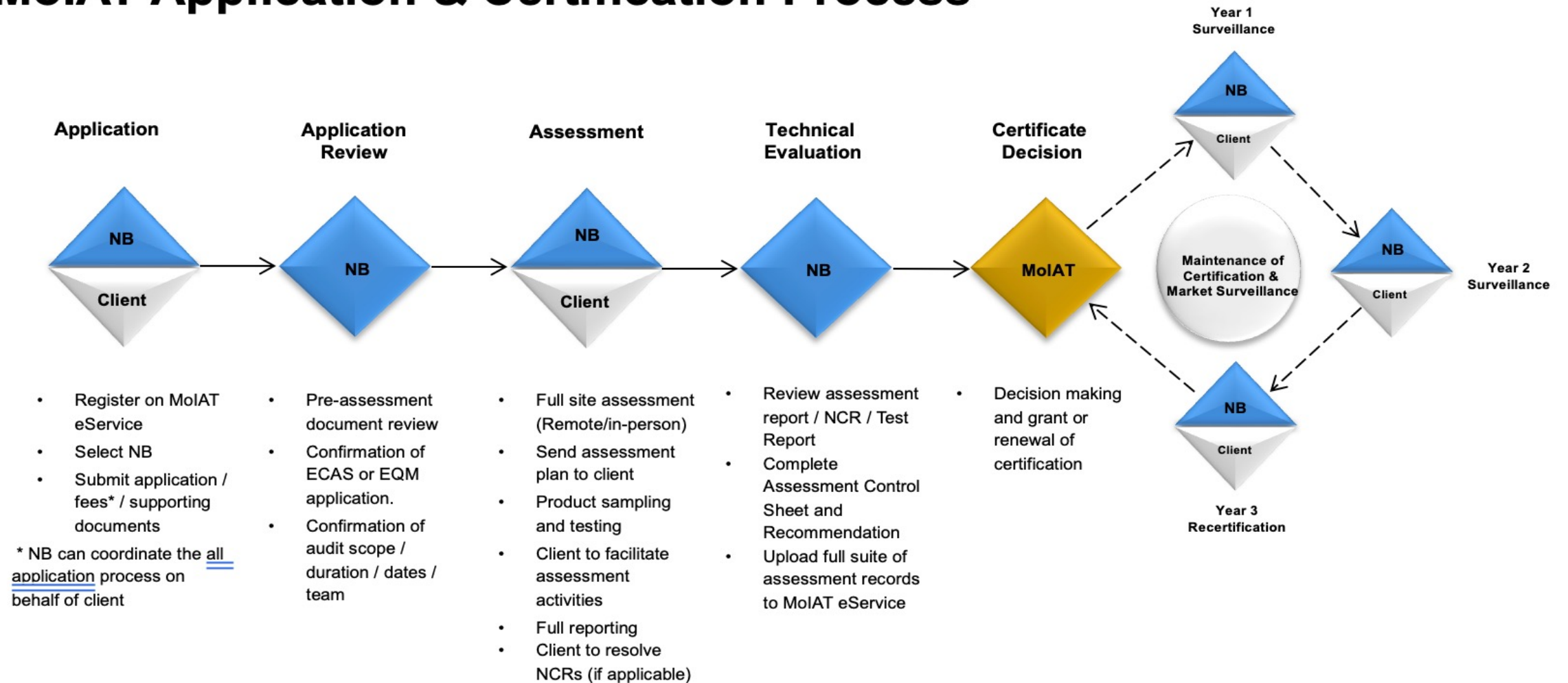
# Dynamic QR code

The dynamic QR code, shall as a minimum, provide secure access to the following data maintained by the Notified Body:

- The Digital Material Passport number
- The name of the manufacturer
- The place of manufacture of the product
- The product standard and version date
- The grade of the steel
- The nominal diameter of the steel
- The cast number
- The format of the steel
- The chemical composition
- The mechanical properties
- The ECAS mark
- The product marking
- The name and/or number of the Notified Body



# MolAT Application & Certification Process



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To conclude:

Example of a low emission steel  
(*green steel*\*) specification




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# Who We Are


Home > Who We Are



The Land Transport Authority (LTA) spearheads land transport developments in Singapore. We plan, design, build and maintain Singapore's land transport infrastructure and systems. We aspire to strengthen Singapore's land transport connectivity and integrate a greener and more inclusive public transport system complemented by walk and cycle options. We harness technology to strengthen our rail and bus infrastructure and develop exciting options for future land



## Green Procurement for Green Buildings



ABOUT GREEN BUILDING ABOUT SGBC MEMBERSHIP CERTIFICATION EVENTS RESOURCES SG GREEN MAGAZINE GREEN MEANS GO

### SCBC Certifications

Championing sustainability development to create a greener environment, SGBC has developed initiatives set to raise the green standards in products and services.

- SGBP Certification Scheme
- SGBC Lab Partners
- Directory of Certified Products
- SGBS Certification Scheme
- Environmental Sustainability Services
- Energy Performance Contracting
- EPC Contract Templates
- Zero Capital Partnership Scheme
- Directory of Certified Services
- Green Mark Professionals
- Green Mark Associate

Home > Certification > SGBP Certification Scheme

### Building from Sustainable Products

## BUILDING FROM SUSTAINABLE PRODUCTS

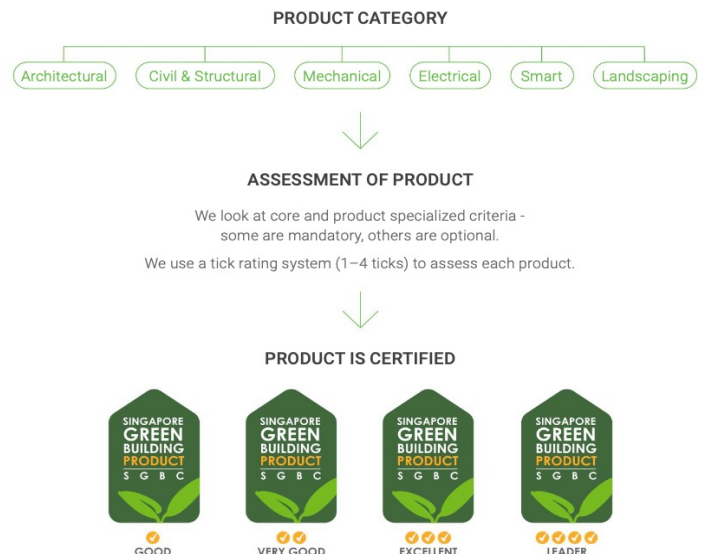


Introducing the Singapore Green Building Product Certification Scheme

ABOUT SINGAPORE GREEN BUILDING PRODUCT CERTIFICATION SCHEME

# WHAT THE PRODUCT CERTIFICATION SCHEME IS

## WHAT THE SCHEME IS AND HOW IT WORKS



Singapore Green Building Product Certification Scheme

## INTRODUCTION TO SGBP



### OVERVIEW

The SGBP Certification Scheme covers a wide range of products and assesses them based on their sustainability performance.

Environmental and health impacts can occur across a product's lifecycle, from raw material extraction or cultivation, through manufacturing, use and end-of-use management. The SGBP Certification Scheme looks at the whole lifecycle of products to account for the full impact.

### METHODOLOGY

The SGBP Certification Scheme assesses products and materials on their sustainability performance. The assessment criteria is categorised into common criteria which apply to most products and specific criteria which apply only to relevant products.

Our team at SGBC will identify for each applicant which assessment criteria are most suitable for their products.

For some products, the assessment against criteria covers the whole product lifecycle, while for other products, the assessment criteria focuses on a select few lifecycle stages across raw material extraction

or cultivation, manufacturing, distribution, use, and end-of-use.

Our team of assessors at SGBC will assess the degree to which your product meets the assessment criteria. For some products, the applicant will need to show proof of laboratory test results or other documentation to verify the product's alignment with some criteria. A list of lab partners is provided here to assist applicants if third party tests are required.

After the assessment, your product will be awarded between 1 and 4 ticks, based on its performance. 1 tick indicates good performance, while 4 ticks indicates leading industry performance.



# What does *Land & Transport Authority (LTA)* Singapore require ...?

PS-9-73

1. Evidence of compliance with product quality requirements	9.34	<b>Mandatory Use of Green Steel Reinforcement in Permanent Reinforced Concrete Structures</b>
2. Compliance with:	9.34.1	For the purposes of this requirement, green steel reinforcement shall be defined as steel reinforcement bar, coil and de-coiled product produced from electric arc furnace with a scrap content not less than 90%.
i. Scrap content not less than 90%		
ii. At least 50% of total steel reinforcement tonnage shall have scrap content not less than 90%	9.34.2	Green steel reinforcement shall be provided in all permanent reinforced concrete structures, with an aggregate tonnage of at least 50% of the total tonnage of steel reinforcement.
iii. Steel reinforcement shall be certified by SGBC under “Leader” category (four ticks) or equivalent	9.34.3	The green steel reinforcement provided shall be certified by the Singapore Green Building Council (SGBC) under “Leader” category (four-ticks), or equivalent, support by a certified Environmental Product Declaration (EPD) document.
iv. Steel reinforcement shall have an EPD to EN 15804 or equivalent	9.34.4	All steel reinforcement provided in permanent reinforced concrete structures including non-green steel reinforcement shall include an Environmental Product Declaration (EPD) in accordance with EN 15804, or equivalent.
v. Information from EPD shall be incorporated into the Embodied Carbon Report	9.34.5	The EPD document shall be submitted together with the Mill certificate as specified in M&W Specification Chapter 11.
	9.34.6	The information from the EPD document shall be incorporated into the Embodied Carbon Report as required in <b>Clause 22.3</b> and <b>22.5</b> of the Particular Specification.


# Thank you

Contact:

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Web: [www.carescertification.com](http://www.carescertification.com)

LinkedIn: [www.linkedin.com/company/carescertification/](http://www.linkedin.com/company/carescertification/)



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March 2023