



Global Cement and Concrete  
Association

CONCRETE  
FUTURE

# Definitions of Low Carbon Cement and Concrete for Green Procurement: Launch of GCCA Definitions

15<sup>th</sup> October 2024

12:30 – 13:30 (LONDON)



# Definitions of Low Carbon Cement and Concrete for Green Procurement: Launch of GCCA Definitions



**Nicolas Antoniou**  
Sustainable Design and Construction Manager  
GCCA

Speaking on:  
"Measuring and Reporting of EPDs"



**Dr Andrew Minson**  
Sustainable Design and Construction Director  
GCCA

Speaking on:  
"Cement and Concrete Definitions"

# GCCA Membership

## Our Members

Adani Cement (pending application)  
Asia Cement Corporation  
Breedon Group  
BUA Cement  
Buzzi S.p.a.  
Cimenterie Nationale  
Cementir Holding  
Cementos Argos  
Cementos Moctezuma  
Cementos Pacasmayo  
Cementos Progreso  
CEMEX  
Çimsa Cement  
CNBM  
CRH  
Dalmia Cement  
Dangote  
Emirates Steel Arkan  
Fletcher Building  
GCC  
Heidelberg Materials  
Holcim  
Hima Cement  
Huaxin Cement  
JK Cement

JK Lakshmi Cement (pending application)  
JSW Cement  
Medcem  
Misr Cement Group  
Molins  
Nesher Israel Cement Enterprises  
Norm Cement  
Northern Region Cement Company (Saudi Arabia)  
Orient Cement  
PT Solusi Bangun Indonesia  
SCHWENK Zement  
SECIL  
Siam Cement Group  
Siam City Cement  
Taiheiyo Cement  
TCC Group Holdings CO., LTD.  
TITAN Cement Group  
TPI POLENE  
UltraTech Cement  
UNACEM  
Vassiliko Cement  
Votorantim Cimentos  
YTL Cement  
Yura Cement

## National & Regional Association Partners

Asociación de Fabricantes de Cemento Portland – Argentina  
Asociación de Productores de Cemento – Peru  
Associação Brasileira de Cimento Portland – Brazil  
Association of German Cement Manufacturers (VDZ) – Germany  
Association Professionnelle des Cimentiers – Morocco  
Betonhuis – Netherlands  
BIBM – Europe  
CANACEM – Mexico  
Canadian Precast Prestressed Concrete Institute  
Cement Association of Canada  
Cement Concrete & Aggregates Australia  
Cement Industry Federation – Australia  
Cement Manufacturers Association – India  
Cement Manufacturers Ireland

China Cement Association  
Concrete NZ – New Zealand  
European Cement Association (CEMBUREAU)  
European Federation Concrete Admixtures  
European Ready Mixed Concrete Organisation  
Federación Iberoamericana del Hormigón Premezclado – LatAm  
Federación Interamericana del Cemento (FICEM) – LatAm  
Japan Cement Association  
Korea Cement Association  
Mineral Products Association – United Kingdom  
National Ready Mixed Concrete Association – USA  
Portland Cement Association – USA  
South India Cement Manufacturers Association  
Thai Cement Manufacturers Association  
The Spanish Cement Association (Oficemen)  
Turkish Cement Manufacturers Association (TürkÇimento)



# Why Concrete Matters?



# Concrete is the backbone of modern society

Concrete provides a durable and versatile foundation for the infrastructure society needs, from roads and bridges to buildings and dams.

Its strength and longevity enable the development of urban environments, supporting economic growth and enhancing the quality of life for communities around the world.





## Few of the Incredible Benefits of Concrete



Albedo



Availability



Balancing the  
energy grid



Carbon uptake



Circular economy



Concrete for heating  
(Electro-conductive)



Concrete roads



Design for  
disassembly



Disaster resilience



Durability



Fire resistance



Healthy buildings



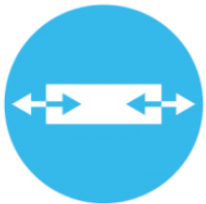
Passive cooling  
using thermal mass



Photocatalytic  
concrete



Porous concrete



Prestressed concrete



Self-healing



Strength



Structure as finish



Versatility



Wide range of  
placements



# Built Environment and the Role of Concrete



**Concrete is fundamental to infrastructure key assets and hence concrete is key to delivering the vast majority of UN sustainable development goals.**

UNOPS, a UN agency, has published a report which identified that the built environment supports society in reaching 92% of the 169 targets in the 17 UN SDGs.

This 92% figure derives from consideration of all parts of the built environment: infrastructure (water, waste, energy, transport and digital communications), buildings and facilities.

# 92%

UNOPS, a UN agency, has published a report which identified that the built environment supports society in reaching 92% of the 169 targets in the 17 UN SDGs.





*Concrete is essential to our lives – but we have to reduce its emissions."*

**John Kerry, United States  
Special Presidential Envoy for Climate**



*Concrete and cement are not just fundamental to constructing roads, bridges and buildings.*

*You are fundamental to building a better world...*

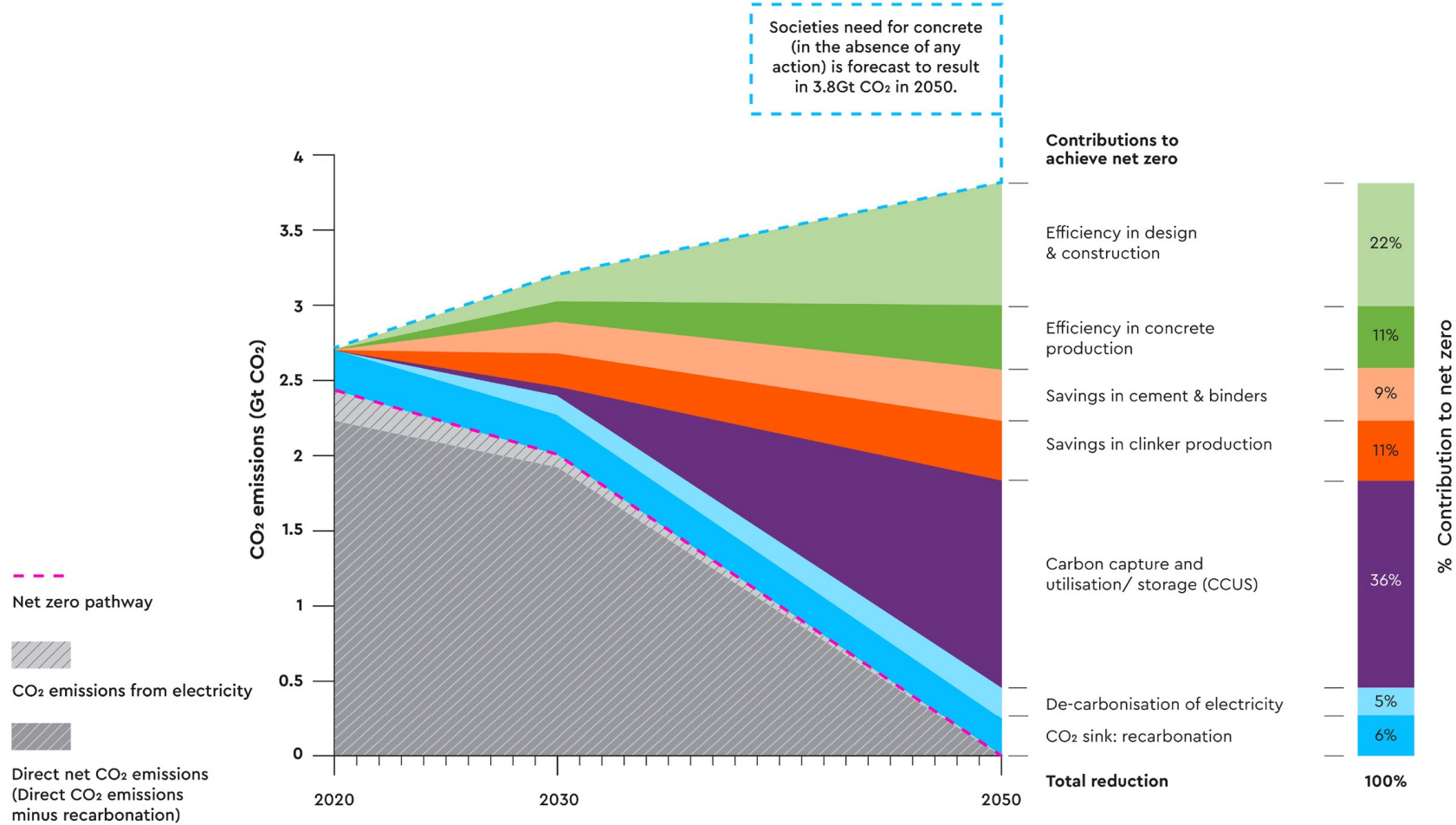
*Three quarters of the infrastructure that will exist in 2050 has yet to be built.*

**António Guterres, Secretary-General of the United Nations**

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# Global Roadmap to Zero

<https://gccassociation.org/cement-industry-net-zero-progress/>

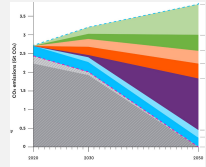




# Country Roadmaps

Country roadmaps – GCCA Net Zero Accelerator Initiative  
A key step in regulatory transition and financing discussion

## KEY DELIVERABLES



**Roadmap Levers and CO<sub>2</sub> impact**  
Per lever, quantification of potential  
CO<sub>2</sub> reduction 2030 & 2050

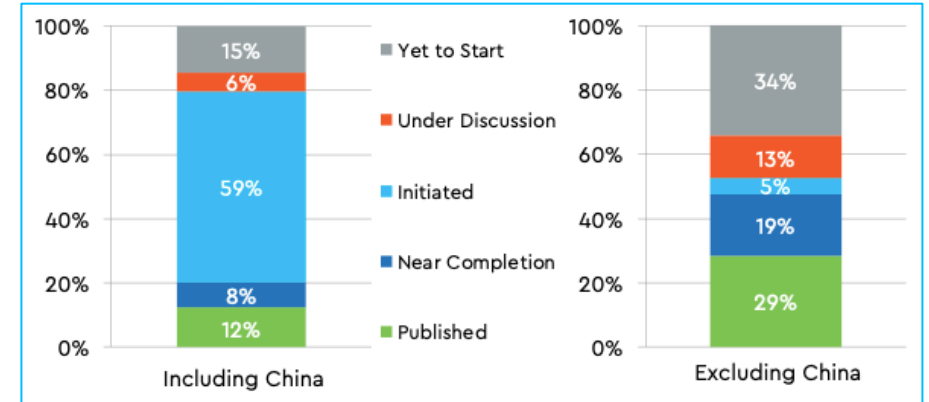
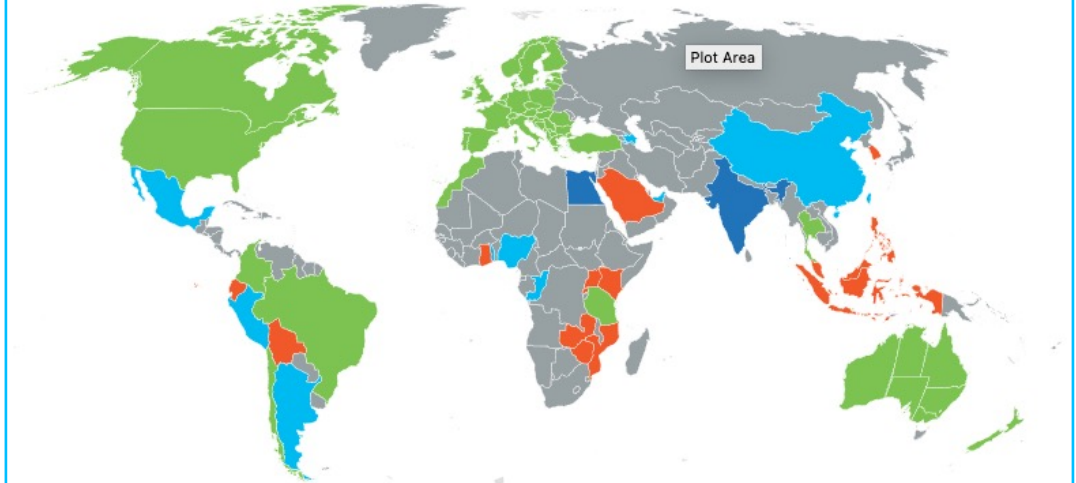


**Policy**  
Per lever, identification of enabling policies



**Lighthouse Projects**  
Per lever, identification of lighthouse projects

## Progress of Roadmaps around the globe



# GCCA Climate Policy and Position Papers

- Circular Economy
- Carbon Pricing
- Carbon Capture Utilisation and Storage
- Co-Processing
- Blended Cement and SCM
- Low Carbon Product Procurement
- Cement Definitions for Low Carbon and Near Zero
- Concrete Definitions for Low Carbon and Near Zero

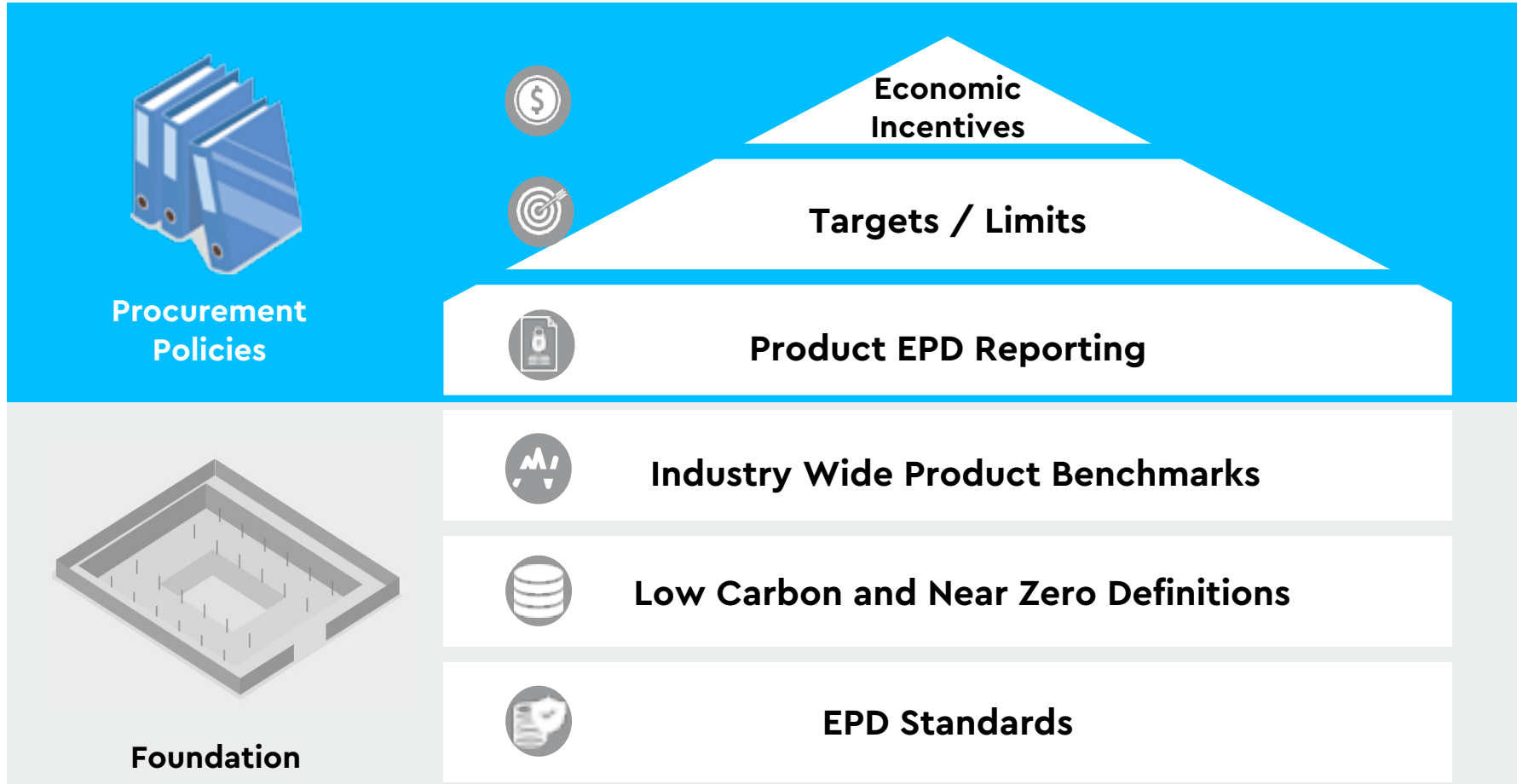
## Policy and Position Papers provide:

- Position statement
- Policy recommendations
- Commitments from GCCA members





# Low Carbon Procurement





# Nicolas Antoniou

Sustainable Design and Construction  
Manager



# Common Reporting Mechanism: Environmental Product Declarations (EPDs)

## Benefits:

- Standardised rules for creating EPDs across construction materials
- Existing infrastructure for EPDs (program operators, verifiers, software tools)
- EPDs include carbon footprint indicator (ECO<sub>2</sub>e or GWP)
- Familiarity with EPDs among project stakeholders

## Challenges:

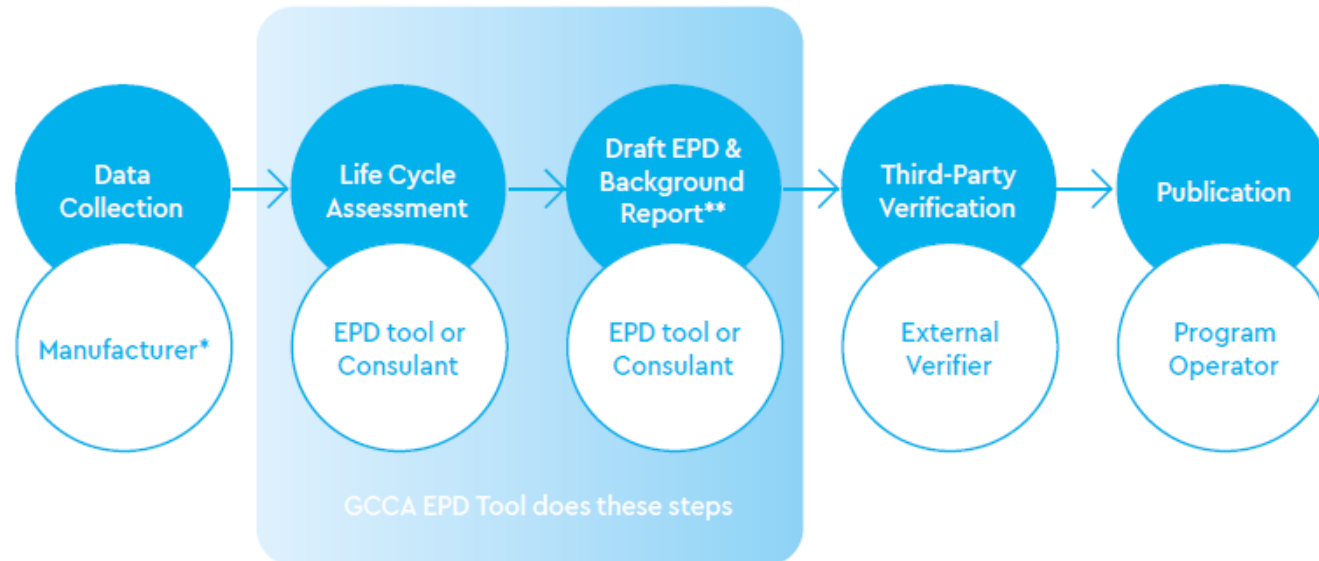
- Inconsistencies due to:
  - Different standards (e.g. EN 15804 vs. Nth America)
  - Differences in life cycle stages considered (cradle-to-gate, etc.)
  - Variation in non-product specific data (e.g. different databases)

## Solution:

- IDDI initiative aims for EPD standards to align
- ALL LCP initiatives should account for the challenges and seek to ensure consistent reporting
- Global LCP should account for unresolved regional differences

## GCCA EPD Tool

Supports companies to prepare Environmental Product Declarations (EPDs) for **clinker, cement, concrete, aggregates and precast products**.



*\* The manufacturer manages all stages and liaises with many points of contacts*

*\*\* The background report contains confidential information and is only used by the external verifier*

Find out more: [gccaeprd.org](https://gccaeprd.org)



Upcoming Webinar:  
December 2024

**"Environmental Product  
Declarations – An overview of  
EPDs and the GCCA EPD Tool"**

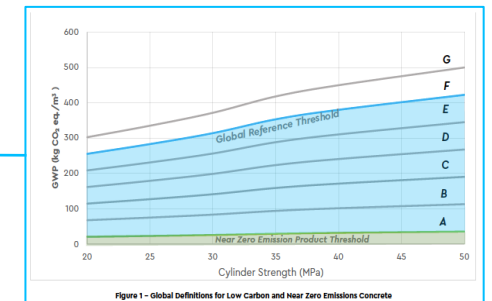
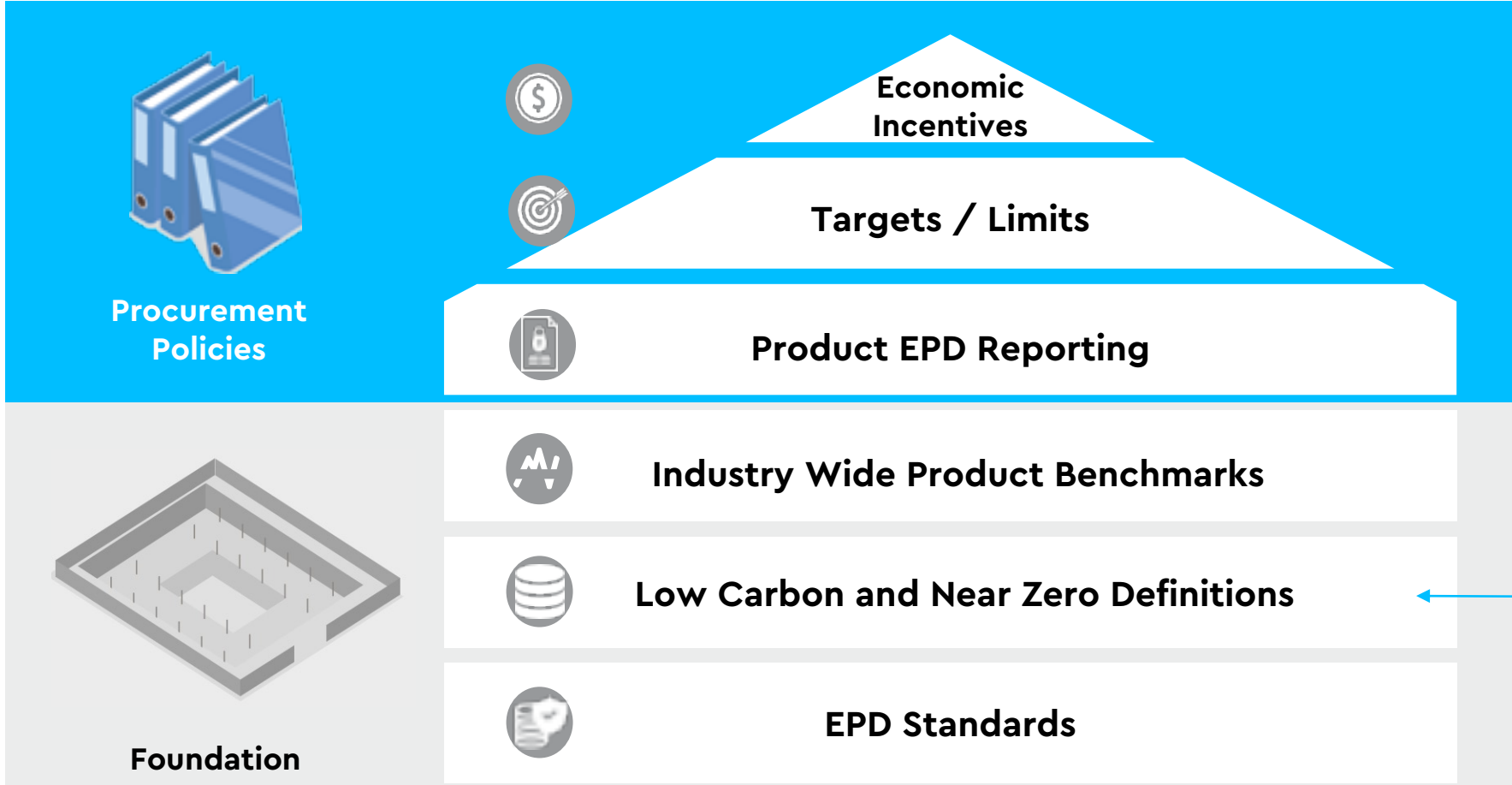


# Andrew Minson

Concrete and Sustainable Construction  
Director



# Low carbon Procurement



# Cement CO<sub>2</sub> and Energy Protocol

- [The Cement CO<sub>2</sub> and Energy protocol V3](#) is **based on calculation methods that are compatible with IPCC 2006 Guidelines** for National Greenhouse Gas Inventories\* issued by the Intergovernmental Panel on Climate Change (IPCC), and with the revised WRI / WBCSD Greenhouse Gas Protocol (2004).

*Note : None of the above-mentioned reference documents have been revised since their respective year of publication*

- The GCCA is soon to finalise a revision of its CO<sub>2</sub> and Energy protocol to align with new guidance from SBTi, ISO guidelines (see next slide), and technological advancements like CCUS and calcined clays. **The new CO<sub>2</sub> and Energy Protocol will be available early 2025.**



# Cement CO<sub>2</sub> and Energy Protocol: aligned with ISO Standards

In Version 3:

ISO Standards	Full Name
ISO 14064-1: 2006	Greenhouse gases. Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals. International Organization for Standardization, Switzerland

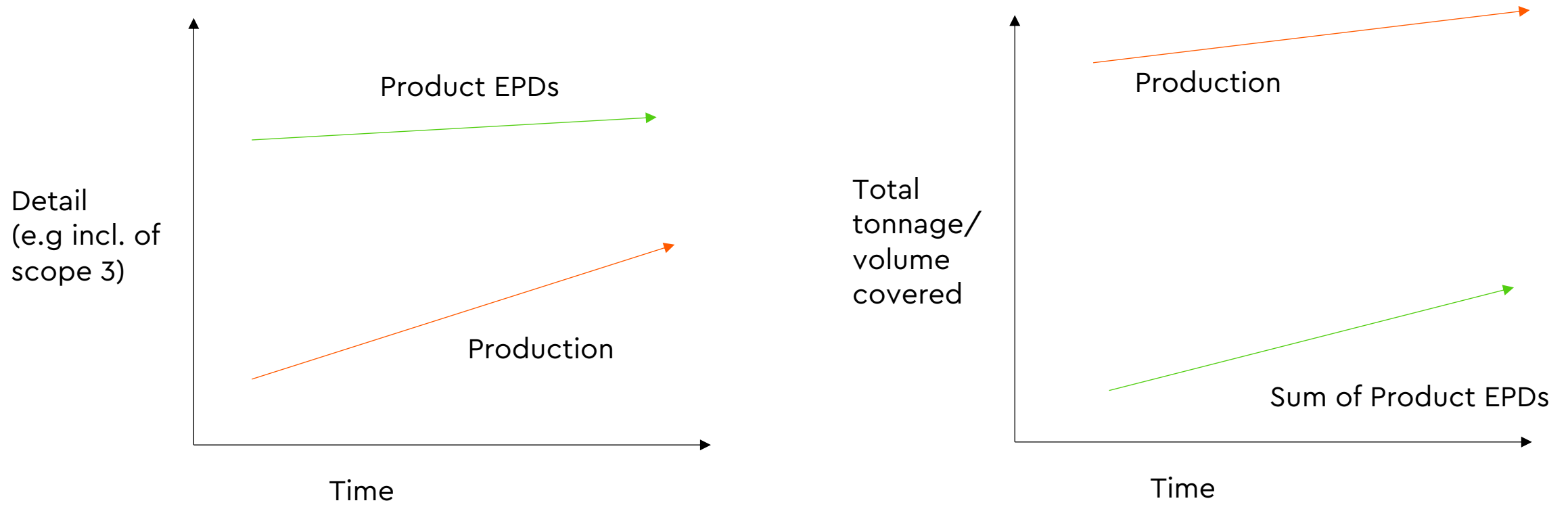
In the upcoming Version 4.X:

ISO Standards	Full Name
ISO 19694-1:2021	Stationary source emissions — Determination of greenhouse gas emissions in energy-intensive industries — Part 1: General aspects
ISO 19694-3:2023	Stationary source emissions — Determination of greenhouse gas emissions in energy-intensive industries — Part 3: Cement industry
ISO 14064-1:2018	Greenhouse gases — Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals
ISO 14064-2 : 2019	Greenhouse gases — Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements
ISO 14067:2018	Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification



# Carbon Accounting: Congruent not identical

Production and Product: Complimentary

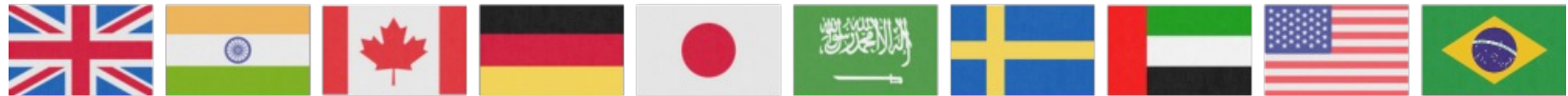


## Industrial Deep Decarbonisation Initiative (IDDI)

"The Clean Energy Ministerial's IDDI is a global coalition of public and private organisations who are working to stimulate demand for low carbon industrial materials." (<https://www.unido.org/IDDI>)

### Member Countries:

- Co-led by the United Kingdom and India.
- Canada
- Germany
- Japan
- United Arab Emirates
- Saudi Arabia
- Sweden
- United States
- Brazil



# Industrial Deep Decarbonisation Initiative Pledges

## Level One

Starting no later than 2025, **require disclosure** of the **embodied carbon in cement/concrete and steel** procured for public construction projects.

## Level Two (in addition to Level 1)

Starting no later than 2030, conduct **whole project life cycle assessments** for all public construction projects, and, by 2050, achieve net zero emissions in all public construction projects.

## Level Three (in addition to Levels 1 and 2)

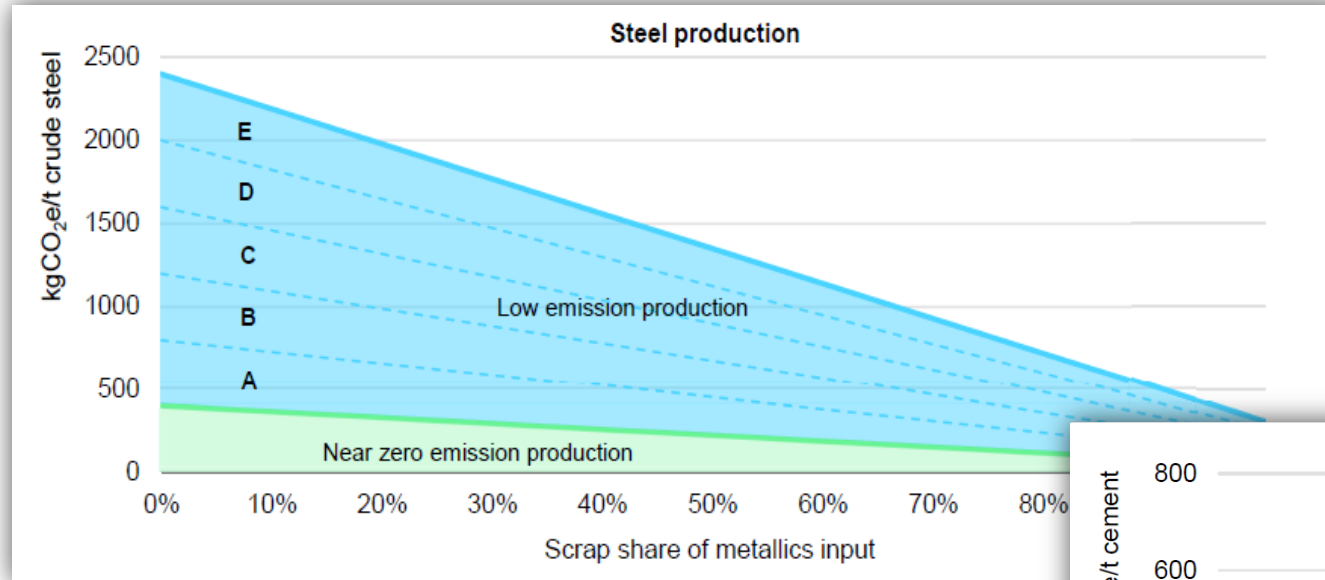
Starting no later than 2030, **require procurement** of **low emission cement/concrete and steel** in public construction projects, applying the highest ambition possible under national circumstances.

## Level Four (in addition to Levels 1, 2 and 3)

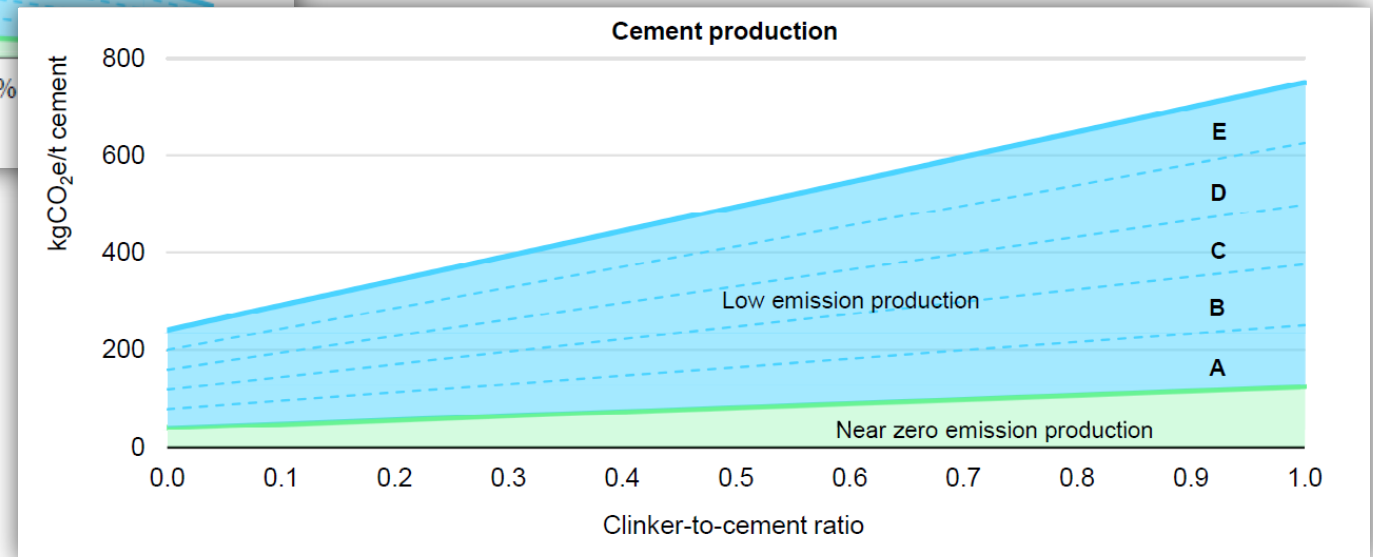
Starting in 2030, **require procurement** of a share of **cement and/or crude steel from near zero emission** material production for signature projects.



# IEA definitions for low and near zero emission steel and cement

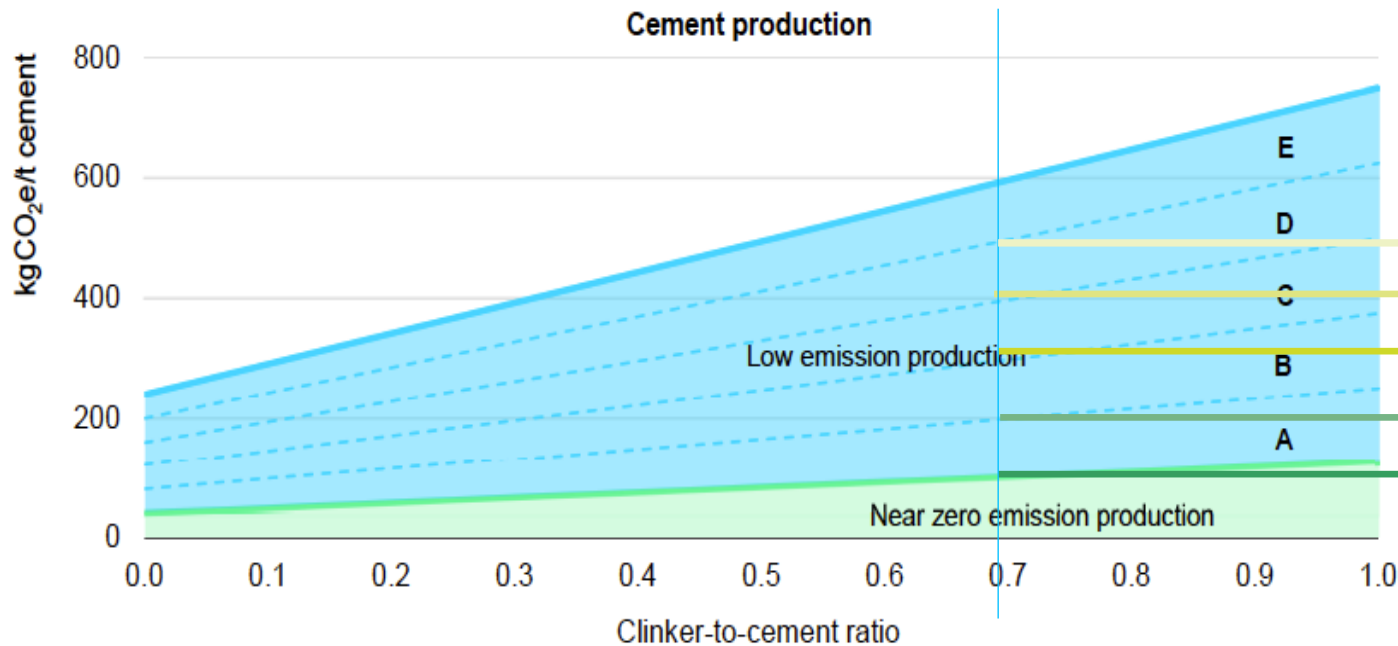


IEA Report:  
"Achieving Net Zero  
Heavy Industry Sectors"  
May 2022



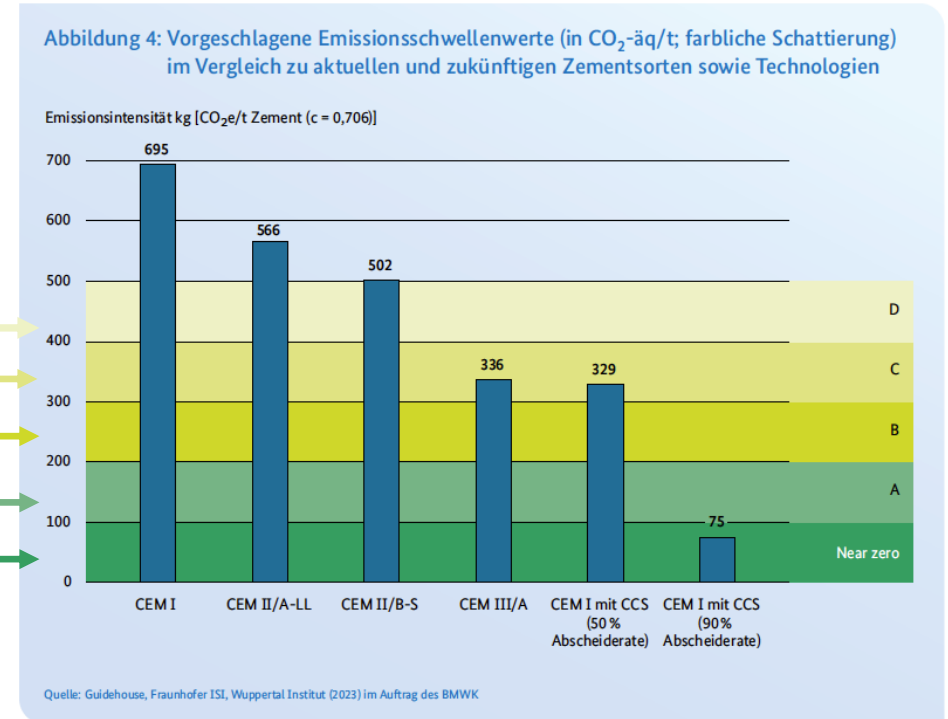
- Separation of definitions and targets
- Same static bands for all countries
- "Near zero" band defined by destination at 2050
- Upper bound of band "E" defined recognising current good practice
- Five low carbon emission bands "A to E" , with equal spacing

# IEA Cement Definition and German Application (member of IDDI)



IEA. All rights reserved.

Notes: See the Technical Annex for the formulation of the low emission production thresholds.



- Exercised option to fix clinker cement ratio. Chose 0.706
- Guidance to use net EPD values to determine what band product is in

## What is co processing?

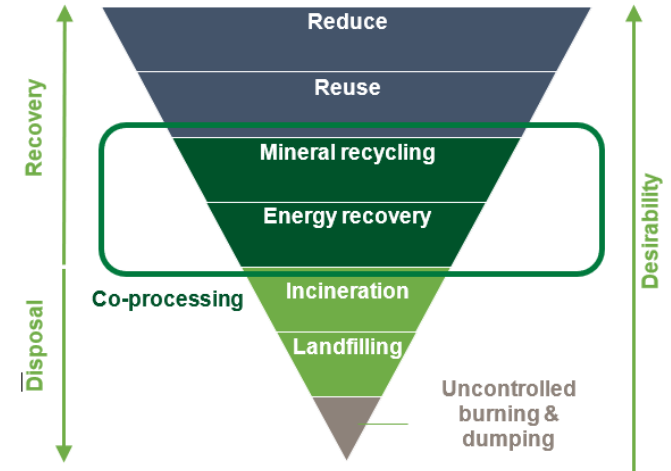
- Treatment of waste in cement kiln : **Energy recovery and mineral recycling**
- Waste that cannot be managed technically or economically by prevention, reduction, reuse or recycling
- More sustainable, compared to waste-to-energy, incineration, or landfill.

## What is polluter pays principle?

- **UNEP:** National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that **the polluter should, in principle, bear the cost of pollution**, with due regard to the public interest and without distorting international trade and investment. (Source: Rio Principle 16) *UNEP website accessed Oct 2024*
- **EU:** The polluter pays principle is a simple idea at the core of EU environmental policy: **those responsible for environmental damage should pay to cover the costs.** *EU website accessed Oct 2024*

## Accounting Definitions

- Gross GWP: emissions minus bio-based emissions
- Net GWP: gross emissions minus emissions from non-biogenic waste





## ECRA Online Seminar

# “Green markets and incentives for low carbon and near zero carbon cement, concrete and concrete buildings“

**30 October 2024, 9:00 CET**

- From low carbon cements to low carbon concrete structures
- Green markets for climate-friendly raw materials
- CO<sub>2</sub> Label for cement
- The Concrete Sustainability Council approach
- Definitions of Low Carbon Cement and Concrete for Green Procurement
- Greenhouse gas-reduction in concrete construction – The German approach to standardization
- Decarbonisation of concrete construction - Practical issues



## Registration

[www.ecra-online.org/seminars](http://www.ecra-online.org/seminars)

Christoph Müller (ECRA)

Stela Ivanova (German Federal Ministry for Economic Affairs and Climate Action, BMWK)

Christoph Müller (VDZ/ECRA)

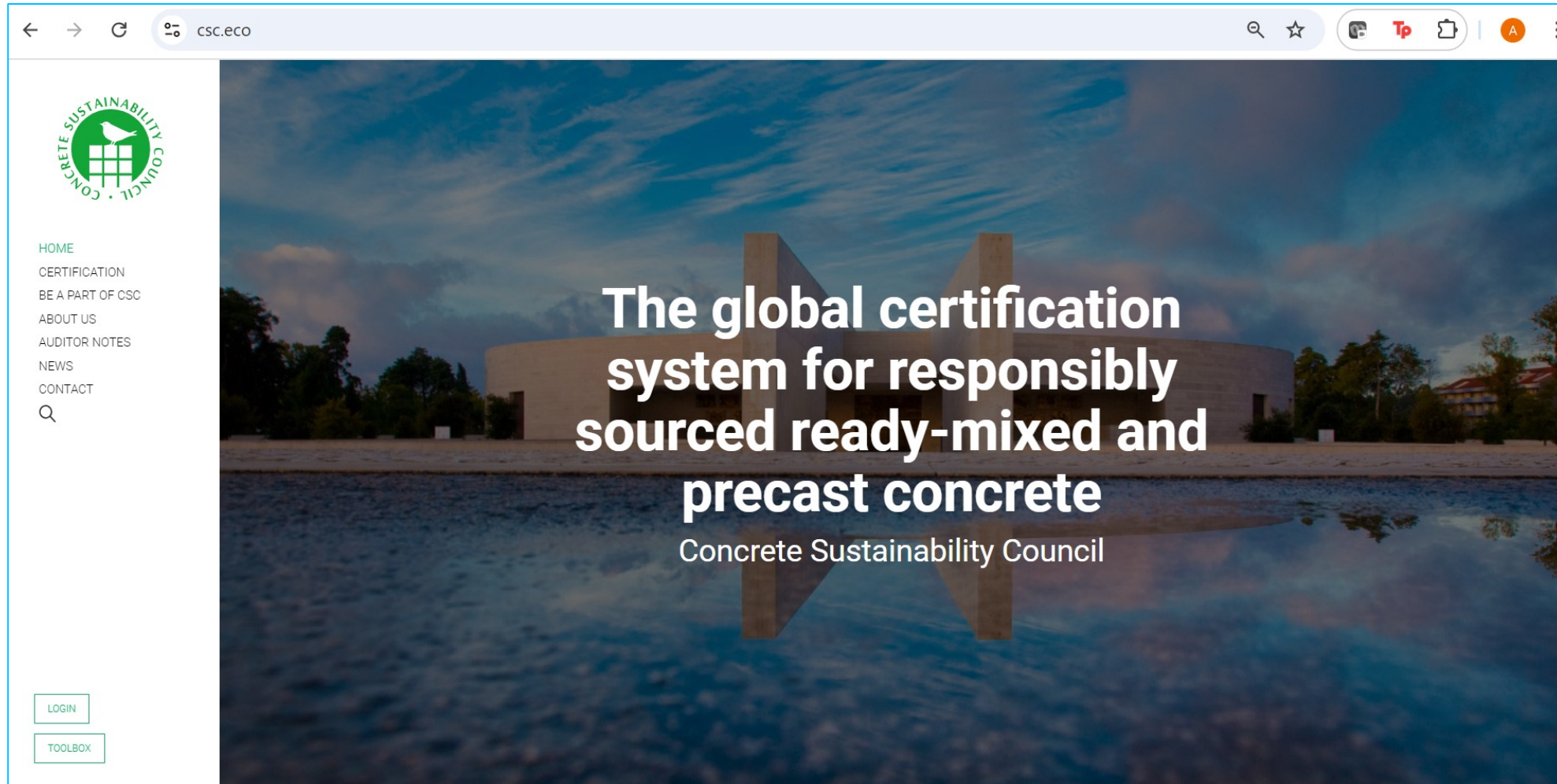
Andreas Tuan Phan (CSC)

Andrew Minson (GCCA)

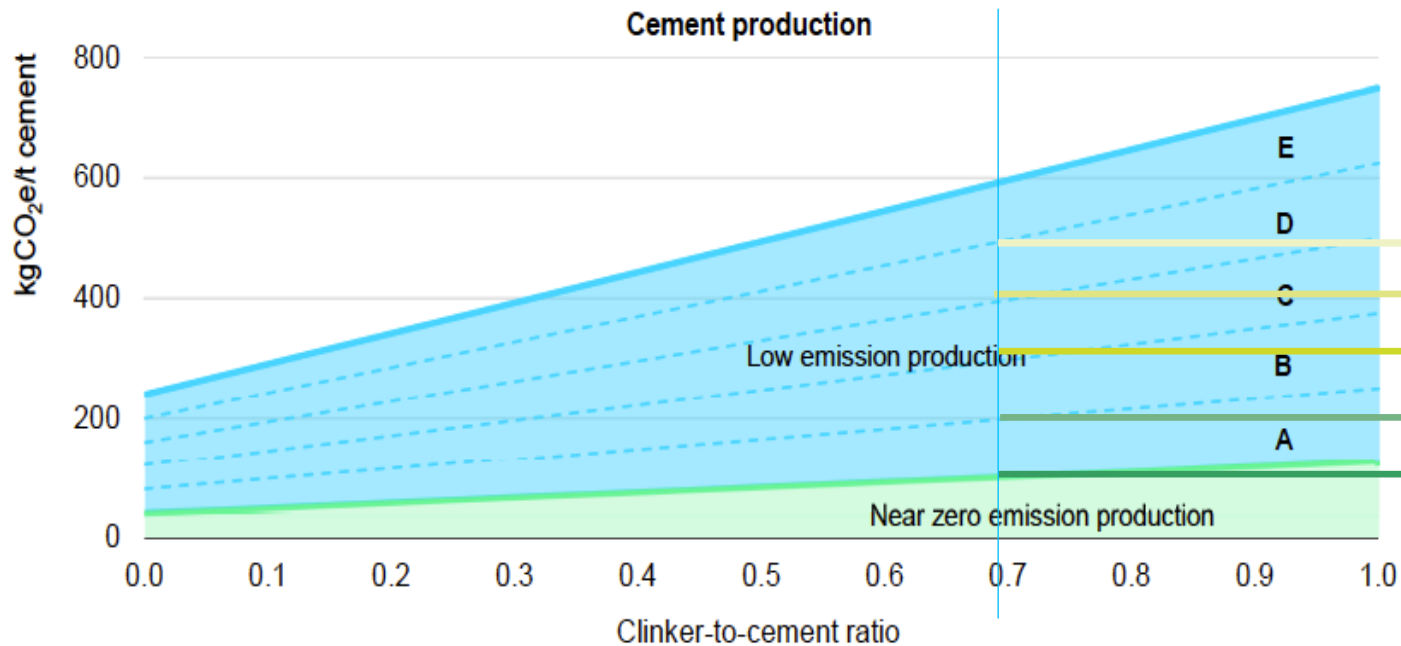
Udo Wiens  
(German committee on reinforced concrete)

tba

# Concrete Sustainability Council

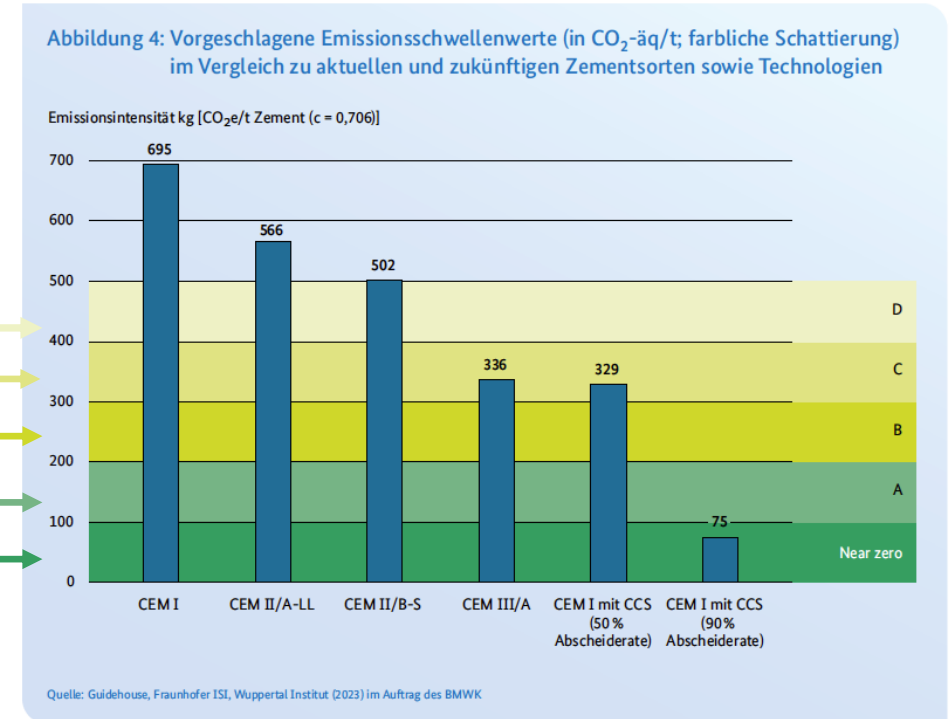


# IEA Cement Definition and German Application (member of IDDI)



IEA. All rights reserved.

Notes: See the Technical Annex for the formulation of the low emission production thresholds.



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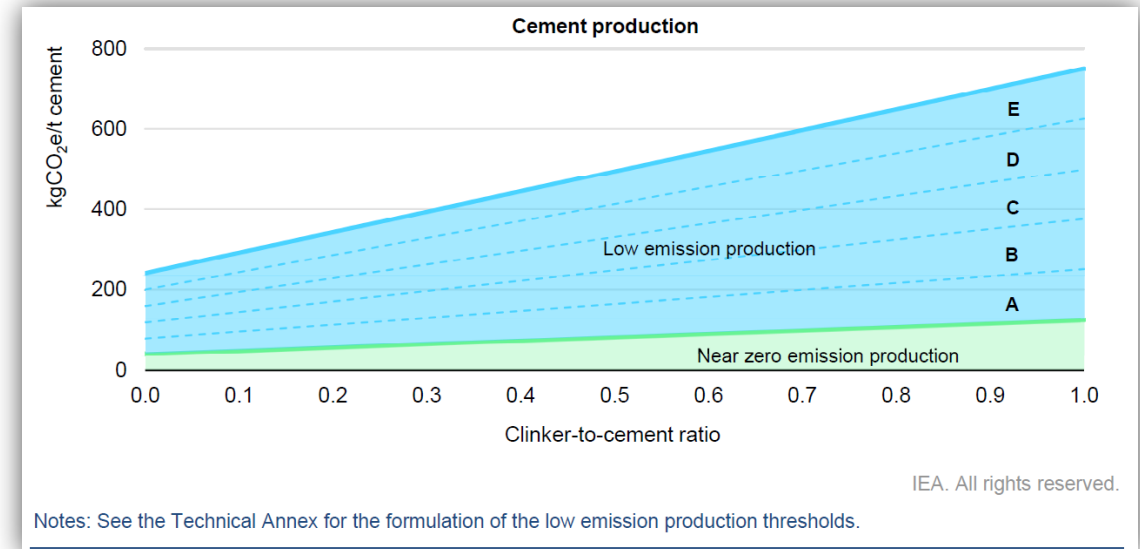
# GCCA Low Carbon and Near Zero Cement Definitions

## GCCA Position:

1. Adoption of IEA definitions for Low Carbon and Near Zero Cement **AND** use of static clinker to cement ratio by countries.
2. Environmental Product Declarations (EPDs) as the basis for carbon footprint reporting, following ISO 21930:2017 and EN 15804 treatment of waste CO<sub>2</sub>e emissions ("Net" GWP).

## Notes:

- Countries to choose appropriate static clinker to cement ratio based on national averages
- "Net" GWP accounting chosen to align with EN 15804, ISO 21930, and GCCA 2050 Roadmap for Net Zero Concrete.
- Cement bands represents "net" values for CO<sub>2</sub>e/t cement
- Country normalisation for different EPD practice expected

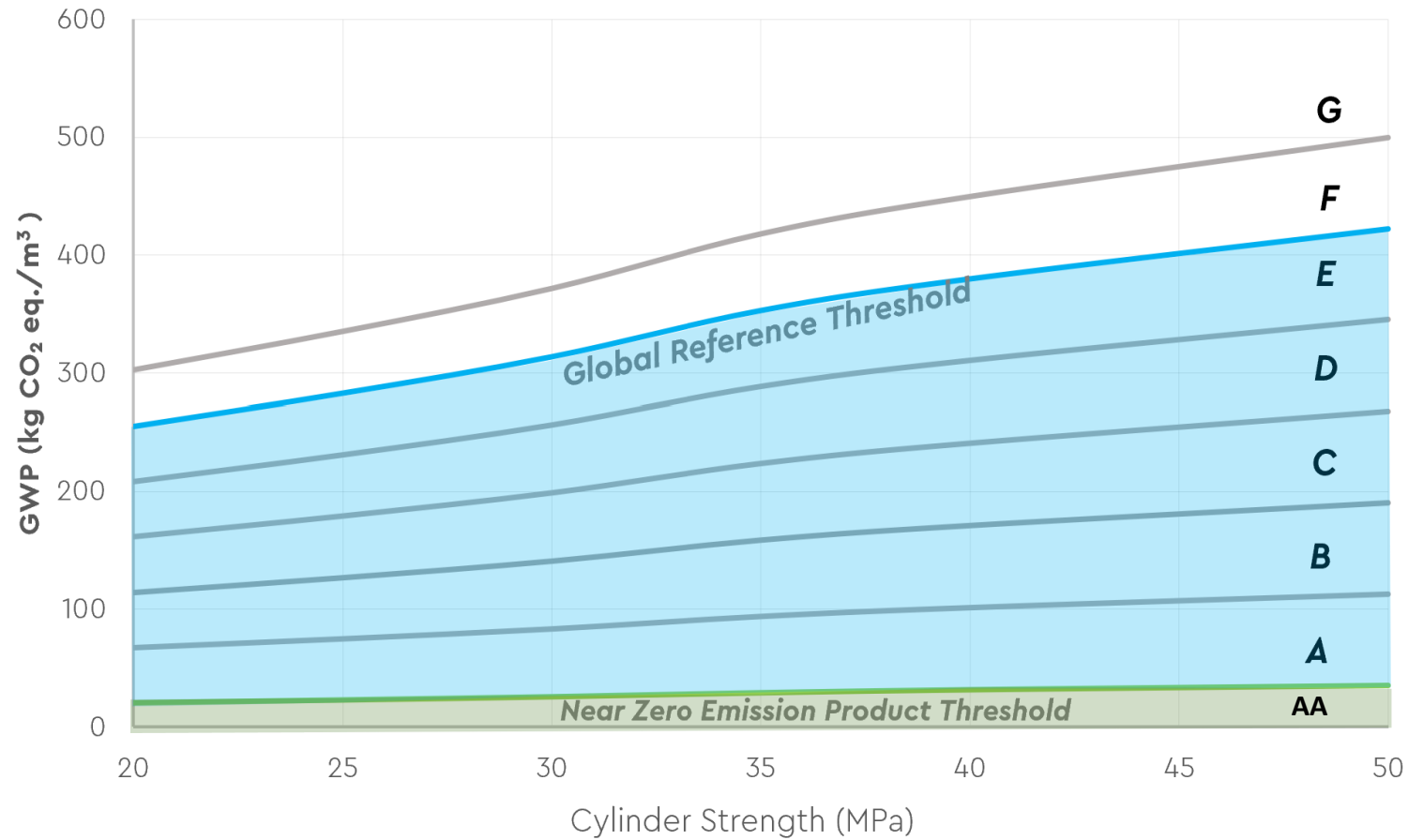


## GCCA Low Carbon and Near Zero Concrete Definitions

GCCA proposal developed with intention that it can be adopted by IDDI.

The following slides are fully GCCA and are not adopted or endorsed by IDDI in any way.

# GCCA Low Carbon and Near Zero Concrete Definitions



## Concrete categories

### **Concrete divided into categories because it is not one product**

- Categories based on strength classes, because that performance characteristic impacts more concretes than any other\*
- Special readymixed concrete which is defined by other performance characteristics may need to be excluded at start of process
- Application to readymixed (approach to precast for discussion)

*\*note that even this is a simplification because concrete's specified for a particular strength but different exposures may require different mixes and hence different  $ECO_2$ . Likewise, construction processes can determine the mix.*



# GCCA Low Carbon and Near Zero Concrete Definitions


## Be congruent with IEA definitions for Cement, in terms of:

- Separation of definitions and targets
- Five low carbon emission bands "A to E" , with equal spacing/range
- "Near zero" band defined by destination at 2050
  - uses IEA cement GWP data as input
  - uses Global Roadmap 2050 forecasts
  - zero contribution from all constituents and processes except cement
- Upper bound of band "E" defined, recognising current good practice
- Same static bands for all countries

# GCCA Low Carbon and Near Zero Concrete Definitions

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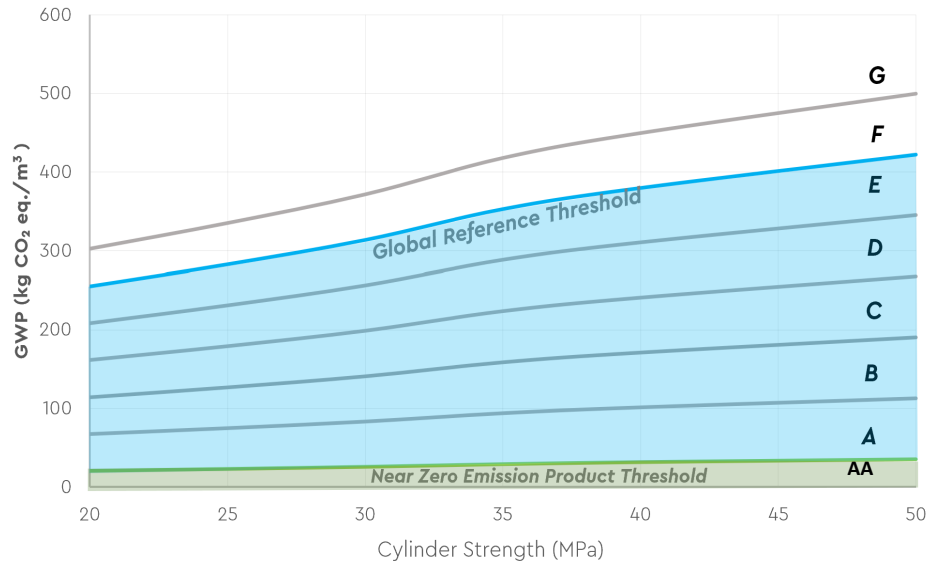
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An IDDI requirement is consistent  
global reporting by countries

Also a benefit for multi country developers, investors,  
clients, producers is consistent definitions

# GCCA Methodology for Concrete Definitions



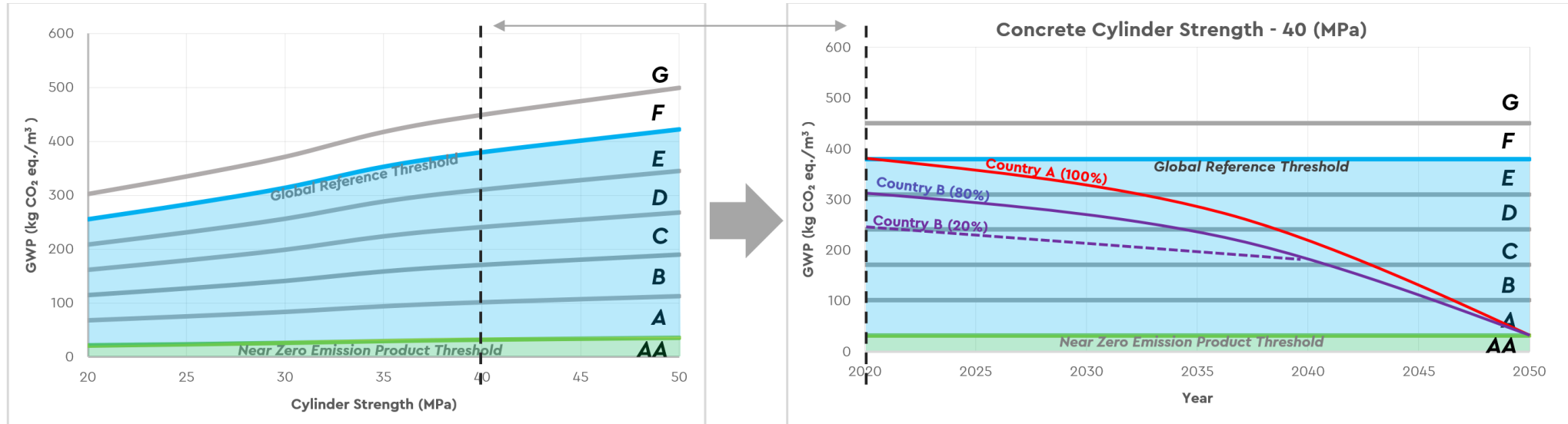
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In addition:

- Bands
  - "F" and "G" bands introduced to allow wider engagement
  - Near Zero named "AA"
  - Carbon negative can be added and named "AAA"
- Categorised on strength
- GWP from EPDs
- Clinker/cement sliding scale NOT applied

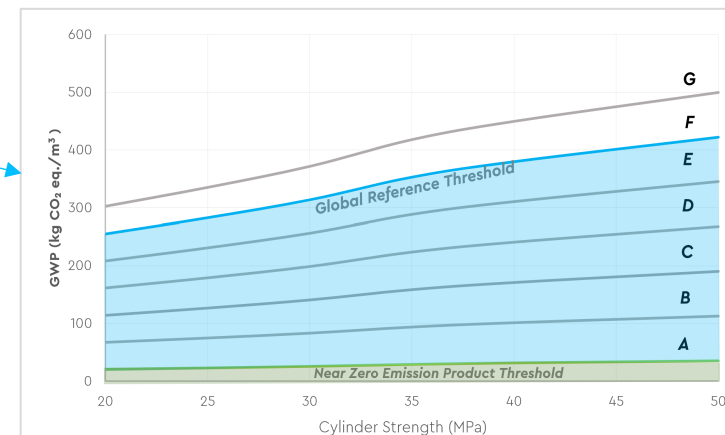
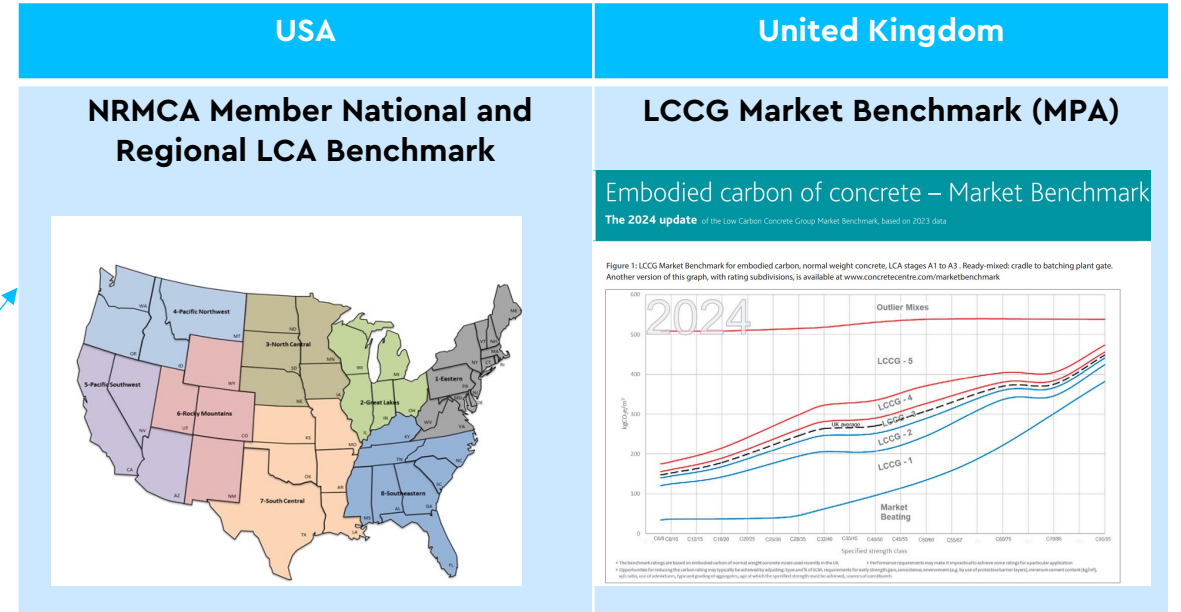
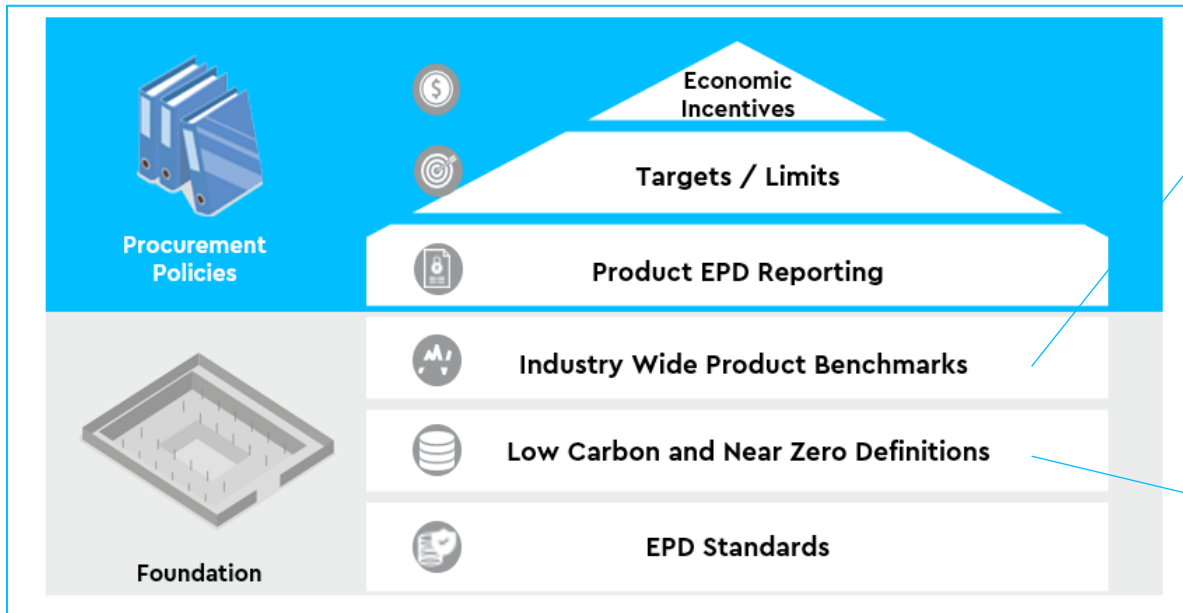
## Country Specific Targets



- Country A target is for 100% of concrete with a GWP value below a decreasing target starting at the global reference threshold in 2020.
- Country B, being more advanced in the decarbonisation journey, has a more ambitious starting point: a target to procure 80% of concrete with a GWP below band D and 20% below band C.



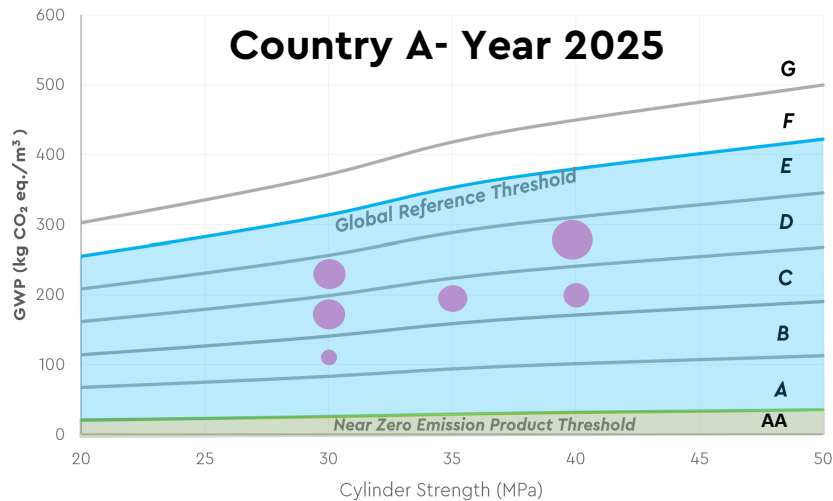
# Industry Wide Benchmarks Country/State/Local/Client



# How do countries report data

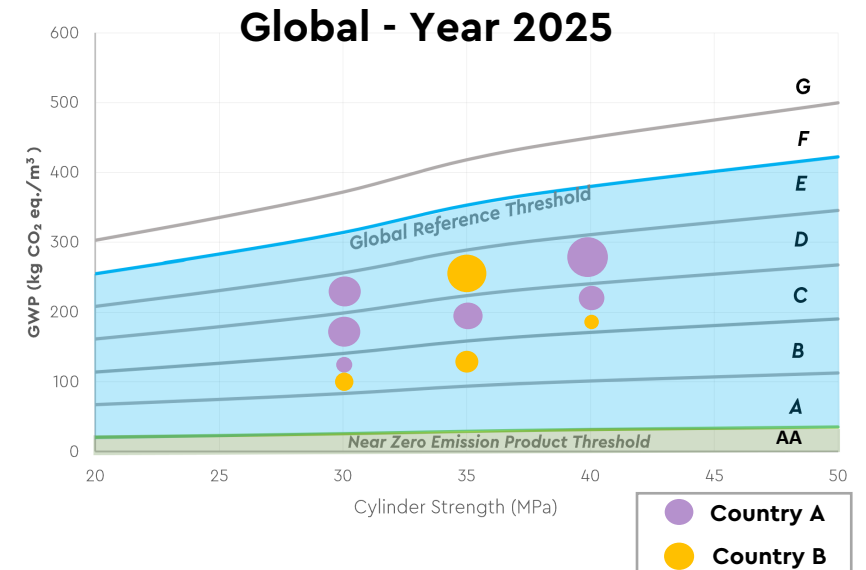
## Country data reporting

Country data (% in each band) plotted on country graphs and reported.



Report country data  
for global reporting

## Aggregated reporting



Explanation:

global bands = country bands  
but

value of global bands  $\neq$  value of country bands

## Normalisation

Normalisation may be required to account for different PCR standards and practises in a country.

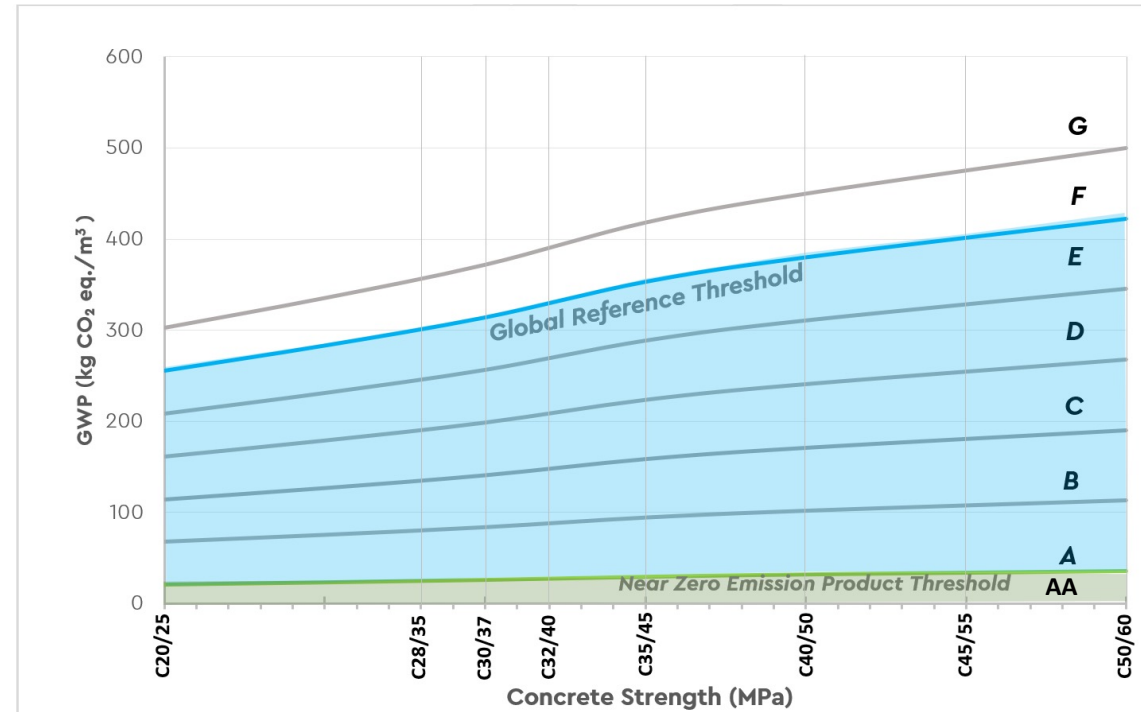
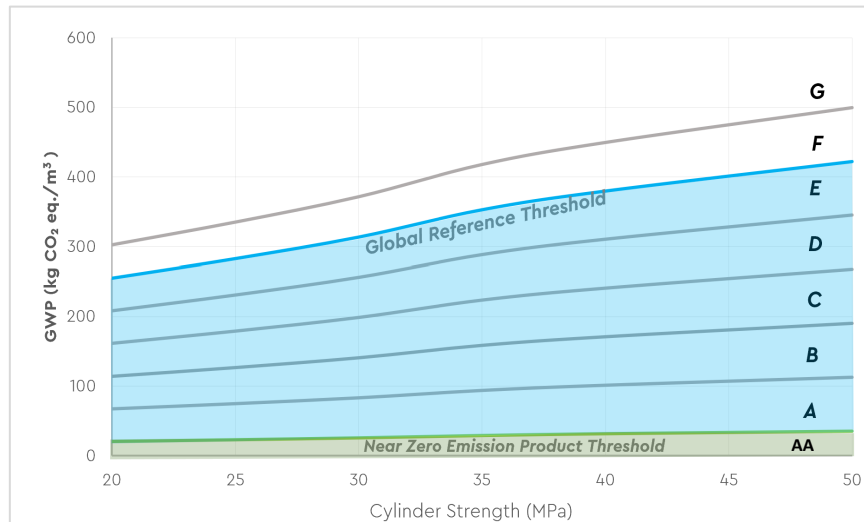
Proposed Global Banding is based on:

- Cylinder concrete strength
- Net GWP
- A1-A3 EPD modules
- EN 15804 (eg economic allocation for ggbs)

Any deviation from the above in a country, would need to be accounted for by a specific country normalisation.

## Normalisation - Example

The example below illustrates how the global banding can be amended for a country that uses both cylinder and cube strength as reference. Nomenclature: **C 20/25**

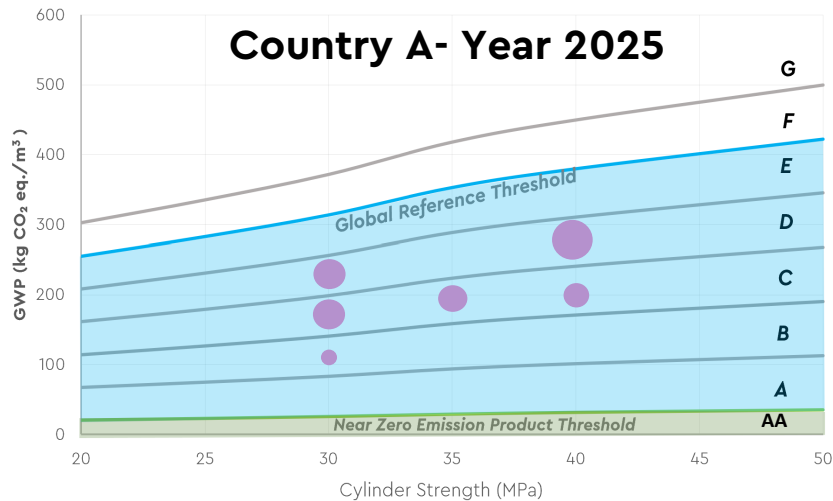




# How do countries report data – still possible following normalisation

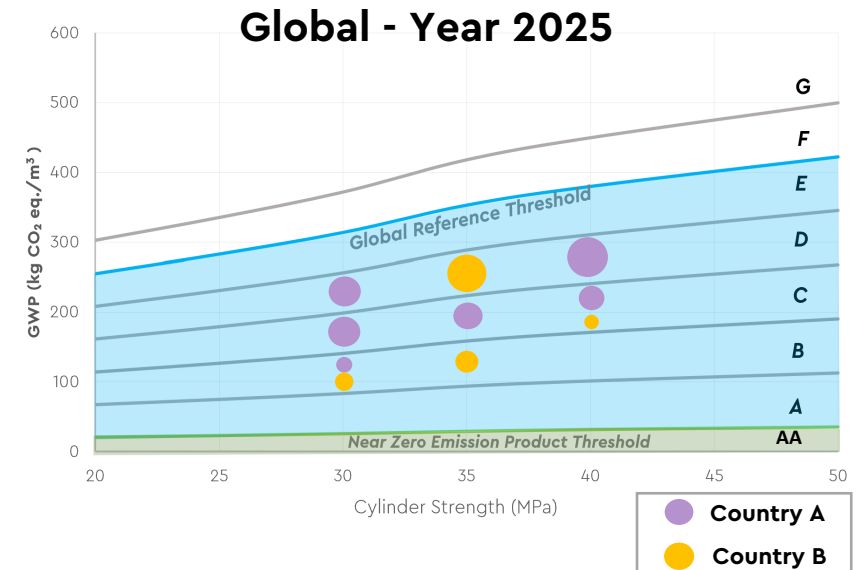
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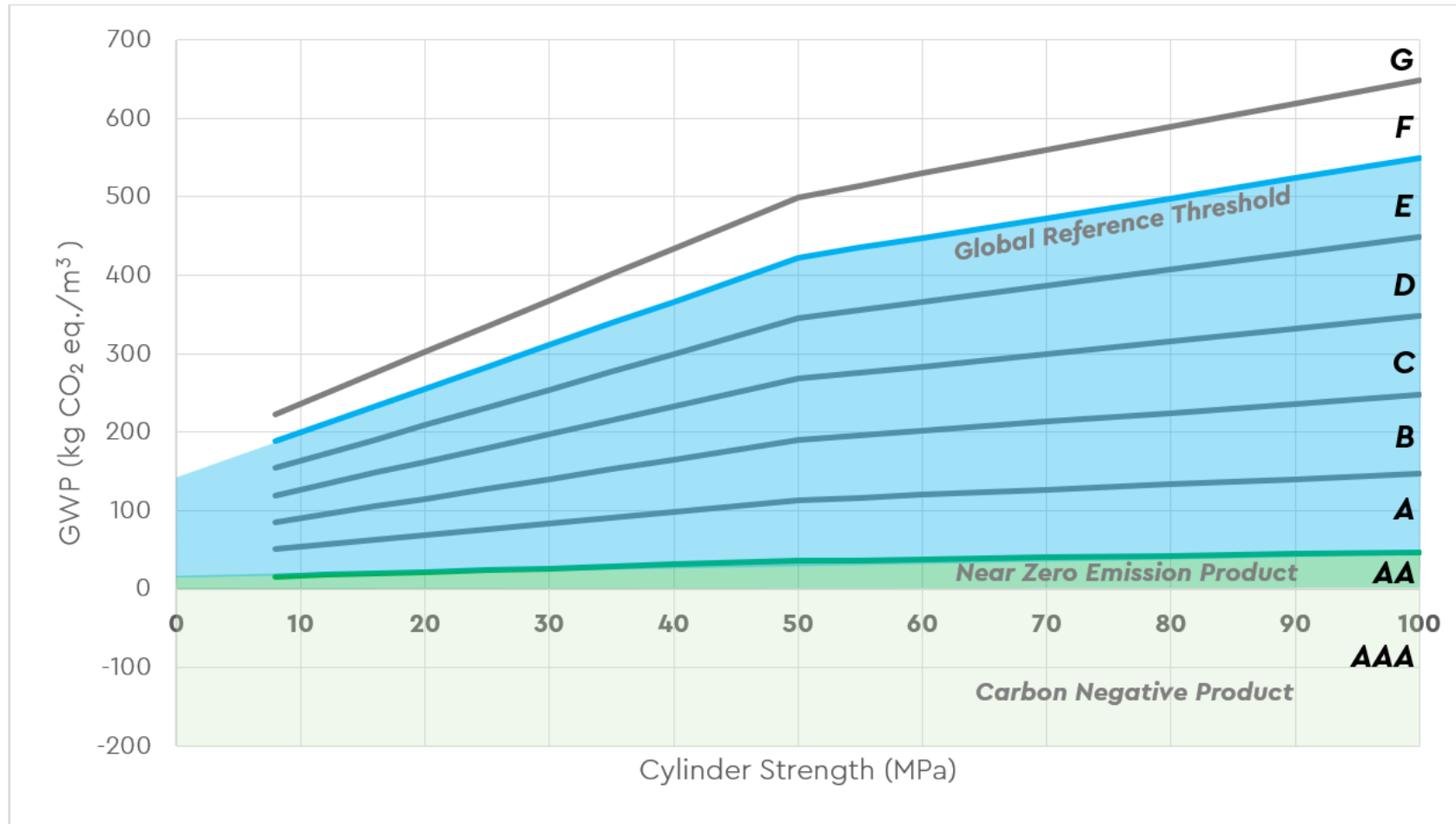


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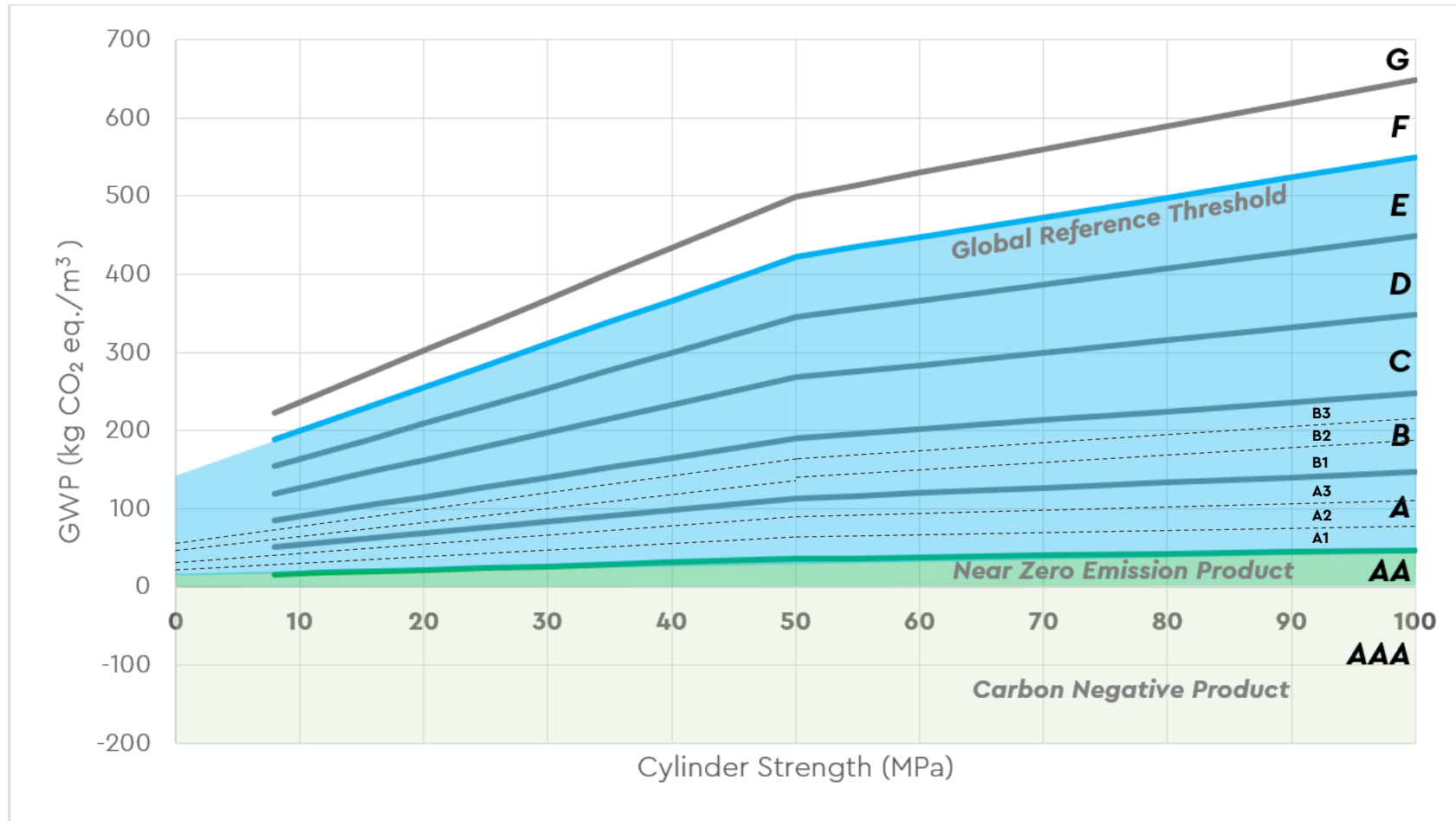
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but

value of global bands  $\neq$  value of country bands

## Optional Country Extension: Strength Range / Carbon Bands

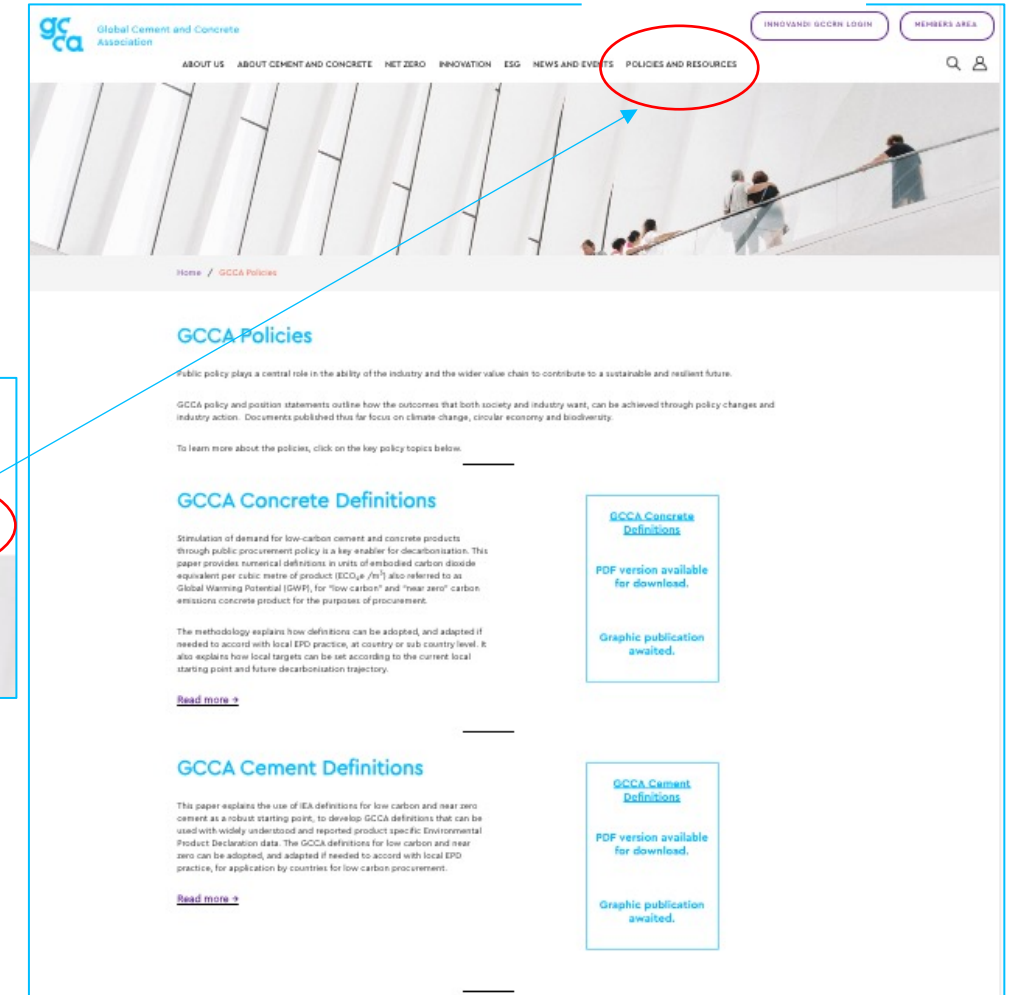
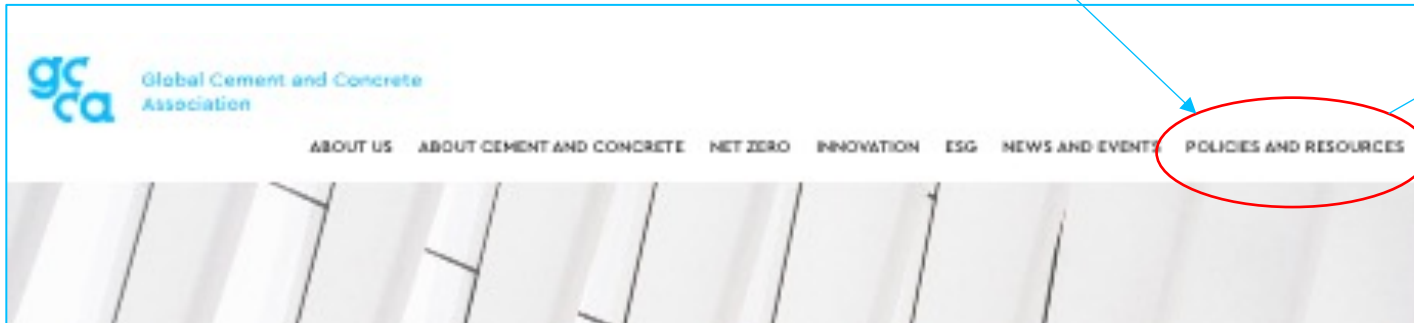


## Optional Country Refinement: Sub Bands



## Find out more

- GCCA Concrete Definitions
  - and
  - GCCA Cement Definitions
- are available GCCA website under "[Policies](#)"



This webinar recording and slides presented will be made available on our site → [GCCA Events](#).



Global Cement and Concrete  
Association

CONCRETE  
FUTURE

# Q&A

[Nicolas.Antoniou@GCCAssociation.org](mailto:Nicolas.Antoniou@GCCAssociation.org)

[Andrew.Minson@GCCAssociation.org](mailto:Andrew.Minson@GCCAssociation.org)



Upcoming Webinar: Oct. 29, 2024

"The role of the cement industry in  
fighting plastic pollution –  
INC-5 Plastic Treaty Road to Busan  
Webinar"

**Registration Link is in the chat**

Thank you for joining us!