Heidelberg Materials

Welcome to evoHub

Please check-in here

Lee Baldwin

Head of Customer Technical Support Concrete

Heidelberg Materials

Agenda

1. Introduction to Heidelberg Materials
2. Constituents of concrete
3. Communicating carbon levels – GWP & EPDs
4. Reducing carbon - SCMs & Carbon Capture Technologies

Heidelberg Materials

HM Business Overview

Heidelberg Materials is one of the world's largest building material companies

Cement	Aggregates	Concrete	Asphalt
127	2934	45	8
Million Metric Tons	Million Metric Tons	Million Cubic Meters	Million Metric Tons

Providing the materials to build the future.

- > 150 years company history
- > 3000 locations
- 50 countries
- 51000 employees

until 2023....

Hanson

HEIDELBERGCEMENT Group

became...

Heidelberg Materials

About Heidelberg Materials

- Leading supplier of lower carbon heavy building materials to the construction industry.
- Produces aggregates (crushed rock, sand and gravel), asphalt, ready-mixed concrete, cement and GGBS.
- Committed to decarbonising the built environment/growing the circular economy.
- Develops digital solutions to improve efficiency, productivity and customer service.

No.1
for cement and concrete

No.2
for aggregates

No.3
for asphalt and contracting

Our business

In the UK, Heidelberg Materials is split into five business lines:

- Aggregates
- Asphalt and contracting
- Cement
- Concrete
- Recycling

2,000+ Heidelberg Materials-liveried vehicles

8 packed product sites

150+ ready-mixed concrete plants

4 marine dredgers

50+ sand, gravel and rock quarries

3 cement plants

35+ asphalt plants

3 grinding plants making Regen GGBS (ground granulated blastfurnace slag)

25+ rail depots and wharves supplied by road, rail and sea

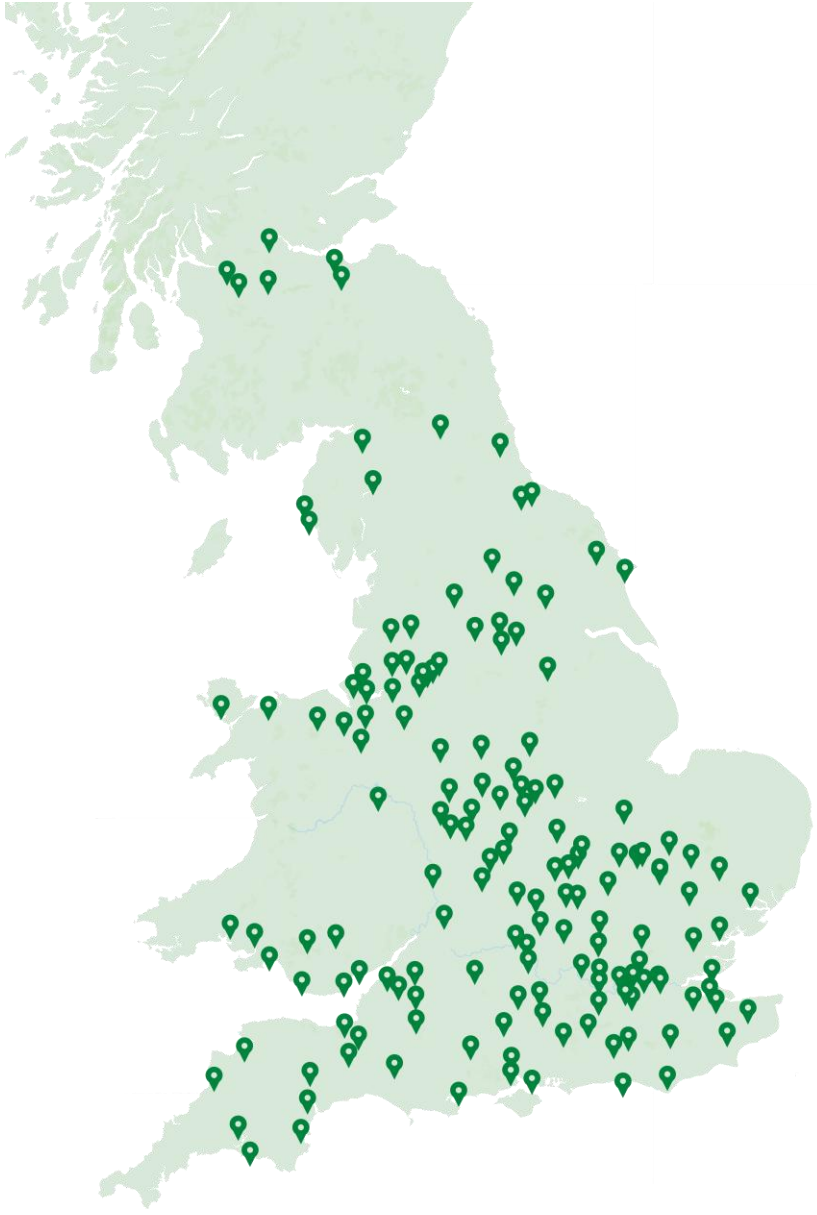
1 joint venture rail company, Mendip Rail

6 landfill sites

10+ waste transfer stations

13 recycling centres

3 hazardous waste treatment sites



Supplying essential building materials

Our products are used to help build the infrastructure we need to live, learn, work and travel:

Residential:
Deansgate Square, Manchester

Commercial:
The Shard, London

Hospitals:
Christie Hospital, Manchester

Tunnels:
Thames Tideway super sewer, London

Bridges:
Second Severn Crossing linking England and Wales

Roads:
A414 resurfacing works, Hertfordshire

Power generation:
Hinkley Point C, Somerset

Sea defences:
Marine Parade, Dawlish, Devon

Sport:
Sir Chris Hoy Velodrome, Glasgow

Rail:
Channel Tunnel rail link

The path to decarbonisation

We are committed to reaching net zero carbon by 2050 and progress to date is good: we have reduced our CO_2 emissions in the UK by more than 50% since 1990.

As we move forward, we are:

- Continuing to invest in plant efficiency across our operations.
- Carbon capture and storage facility at our Padeswood cement works in north Wales under construction
- Increasing the use of alterative raw materials and fuels, and have trialed hydrogen.
- Developing innovative, lower carbon materials.

Introduction to Low Carbon Concrete

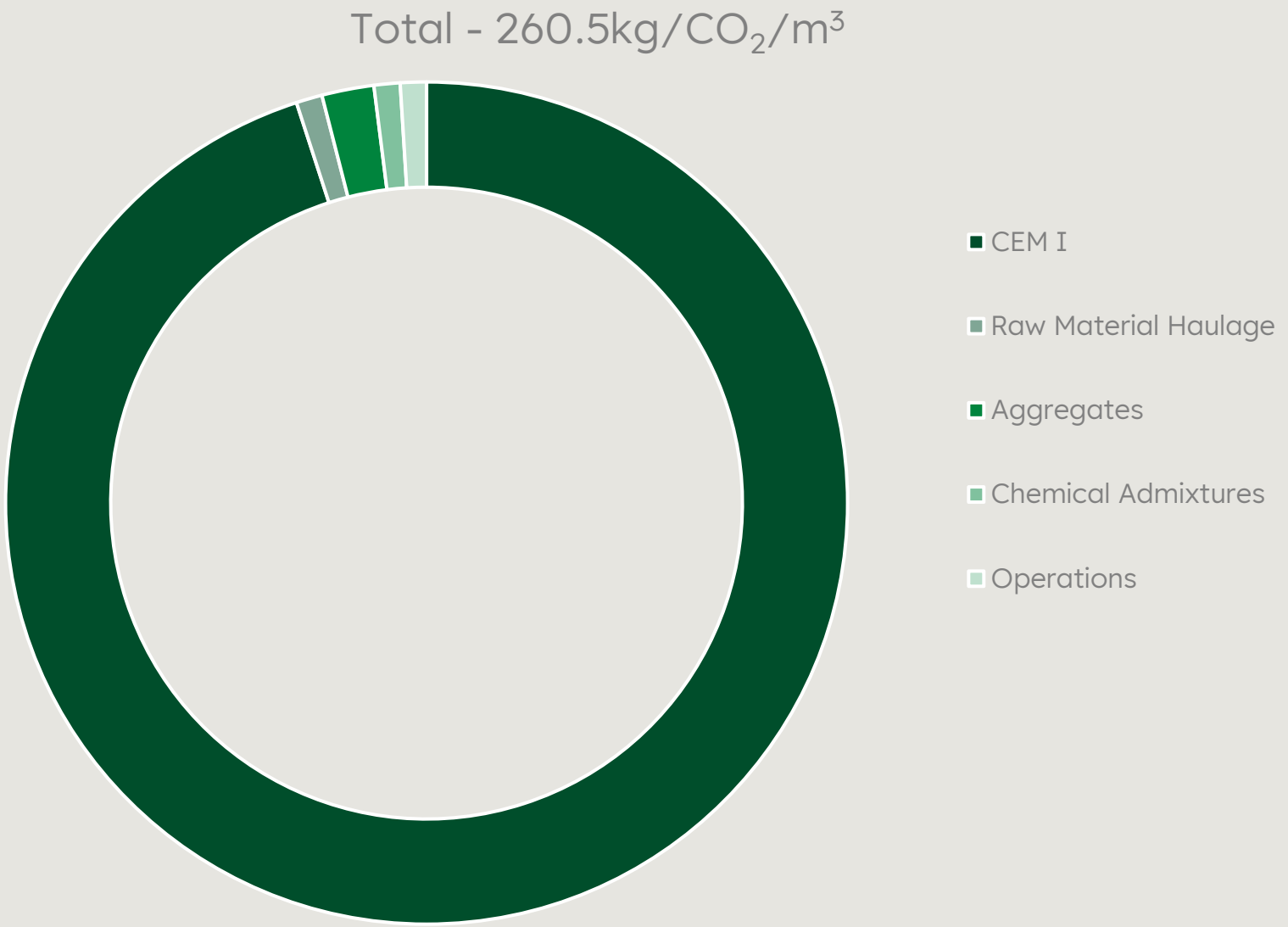
Heidelberg Materials UK Technical Support

2025

Heidelberg Materials

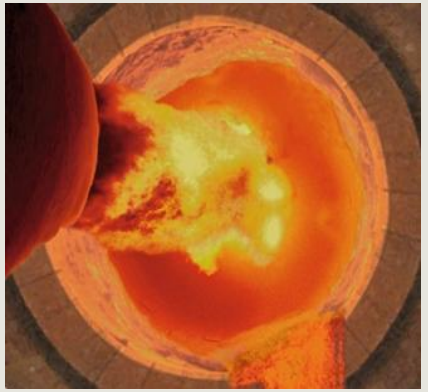
Carbon (CO_2) in concrete

C28/35 CEM I Concrete
Total 260.5kg/CO_2/m^3



Why do we need carbon capture and storage (CCS)?

CEM I = 840 kg CO_2e/tonne
Source MPA Factsheet 18 (2025)



CO_2 emissions from cement production

Process CO_2

68%

Fuel CO_2

32%

$CaCO_3$ + Heat CaO + CO_2

evoBUILD

Low carbon concrete

Heidelberg Materials

Meeting the industry's low carbon needs

- Net zero commitments are becoming a requirement on the majority of new construction projects
- These require reduction in the project's carbon
- Key challenges in specifying concrete are;
  - Benchmarking its carbon intensity against a "fixed and static" reference
  - Access to verified carbon data
- evoBuild, a global brand for low carbon and circular products
- We target **at least 30% CO_2 reduction**, typically 50% or higher versus the 2020 global reference values from the Global Cement and Concrete Association (GCCA) for CEM I
- Movement through the evoBuild increments enables reduction of CO_2.

evoBUILD

gcca Global Cement and Concrete Association

Low Carbon evoBuild Concretes – The Carbon Reduction Levels

The Heidelberg reference is the GCCA value of 788 CO_2/T for CEM I from 2020

evoBuild low carbon concrete 50

50% reduction < 394 CO_2/T Cementitious

evoBuild low carbon concrete 60

60% reduction < 315 CO_2/T Cementitious

evoBuild low carbon concrete 70

70% reduction < 236 CO_2/T Cementitious

Key benefits:

- Reduces carbon emissions by 50-70% against fixed CO_2/T GCCA reference.
- Verified indicative Global Warming Potential (GWP) values provided
- Behaves like current concretes - unchanged construction process.
- Complies with BS 8500 and BS EN 206-1.
- Available nationally

evoBUILD

gcca Global Cement and Concrete Association

Low Carbon evoBuild Concretes – GWP Mapped Against Global Concrete Ratings

evoBuild low carbon concrete 50

GCCA A1-A3 minimum Grade D

evoBuild low carbon concrete 60

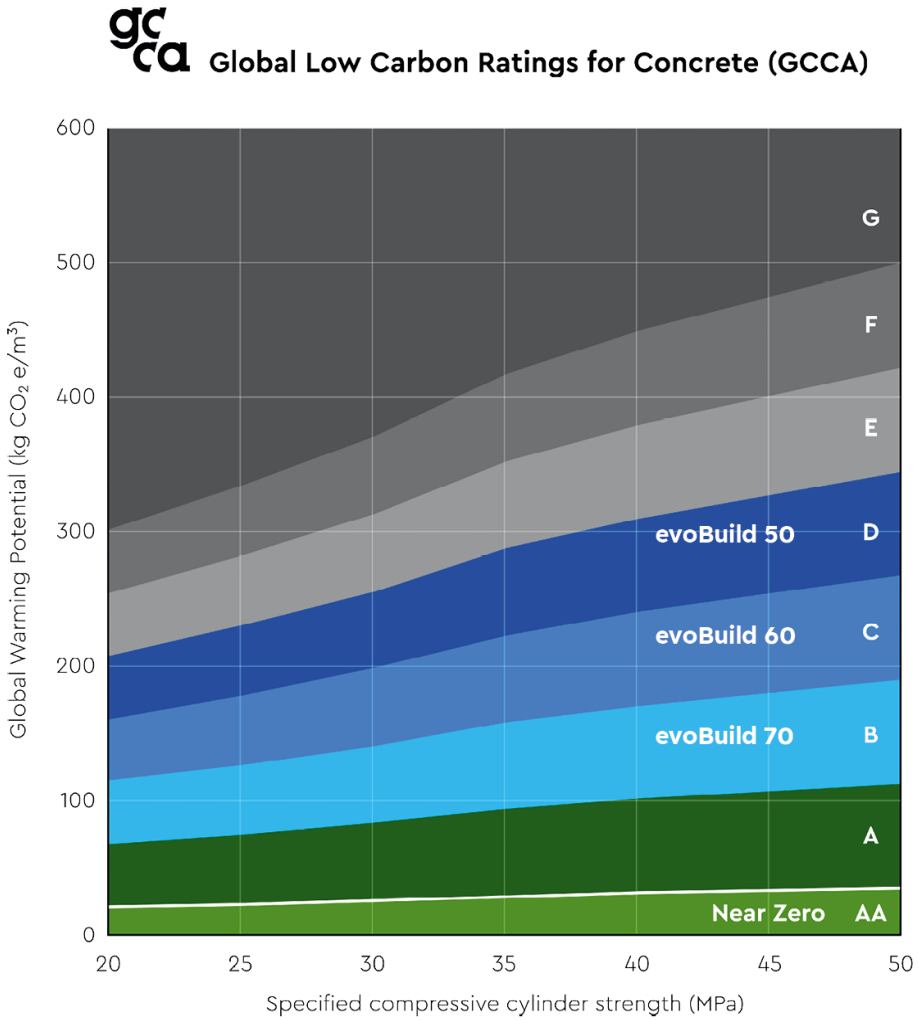
GCCA A1-A3 minimum Grade C

evoBuild low carbon concrete 70

GCCA A1-A3 minimum Grade B

Key benefits:

- Reduces carbon emissions by 50-70% against fixed CO_2/T GCCA reference.
- Verified indicative Global Warming Potential (GWP) values provided
- Behaves like current concretes - unchanged construction process.
- Complies with BS 8500 and BS EN 206-1.
- Available nationally



Ready-Mixed Concrete: Environmental Product Declaration (EPD)

epd-norway
Global Program Operator

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and EN 15804+A2

Heidelberg Materials UK – UK average C28/35 CIIIA Ready-mixed concrete

Owner of the declaration
Heidelberg Materials UK
Second Floor, Arena Court
SL6 8QZ Maidenhead
United Kingdom

Product
UK average C28/35 CIIIA Ready-mixed concrete

Declared product / Declared unit
1 m³ of UK average C28/35 CIIIA Ready-mixed concrete

This declaration is based on Product Category Rules
EN 15804:2012 + A2:2019,
NPCR 020 PART B for concrete and concrete elements (v3.0)

Program operator:
EPD-Norge
Majorstuen P.O. Box 5250
N-0303 Oslo
Norway

Declaration number
NEPD-7893-7537-2

Registration number
NEPD-7893-7537-2

Issue date
21.10.2024

Valid to
21.10.2029

EPD Software
Emidat EPD Tool v1.0.0

Indicator	Unit	A1-3
GWP-total	kg CO_2-eq.	162.68 (145.40)*

Ready-Mixed Concrete

Heidelberg Materials published a series of concrete EPDs in 2024

- C32/40 CIIIB, CIIIA, CEM I
- C28/35 CIIIB , CIIIA, CEM I
- C16/20 GEN3 CIIIA, CEM I

These EPDs

- Use national product data
- The A1-A3 GWP numbers are published for both Gross and Net cement inputs

Ensure that your concrete supplier is able to supply Gross numbers – as used by Low Carbon Concrete benchmarking schemes

Ready-Mixed Concrete: Carbon Information at Quotation Stage and Post Delivery

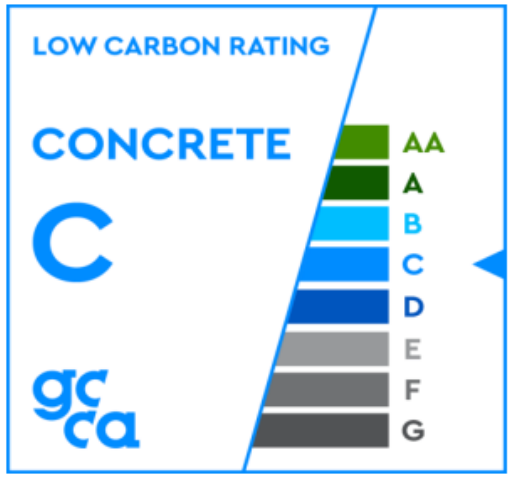
EMBODIED CARBON RATING CERTIFICATE

Concrete mix	C25/30 - MIX 1A
Cube strength, f_{cu}	30 MPa
Cement type	CIIIA+SR
SCM	Regen GGBS
CEMI content	175 kg/m³
w/c ratio	
SCM content	50%
Aggregate type	LIMESTONE 20
Slump class	S3

MIXTYPE/STRENGTH — **Gross** C 198 $kgCO_2e/m^3$

C25/30 — **Net** 179 $kgCO_2e/m^3$

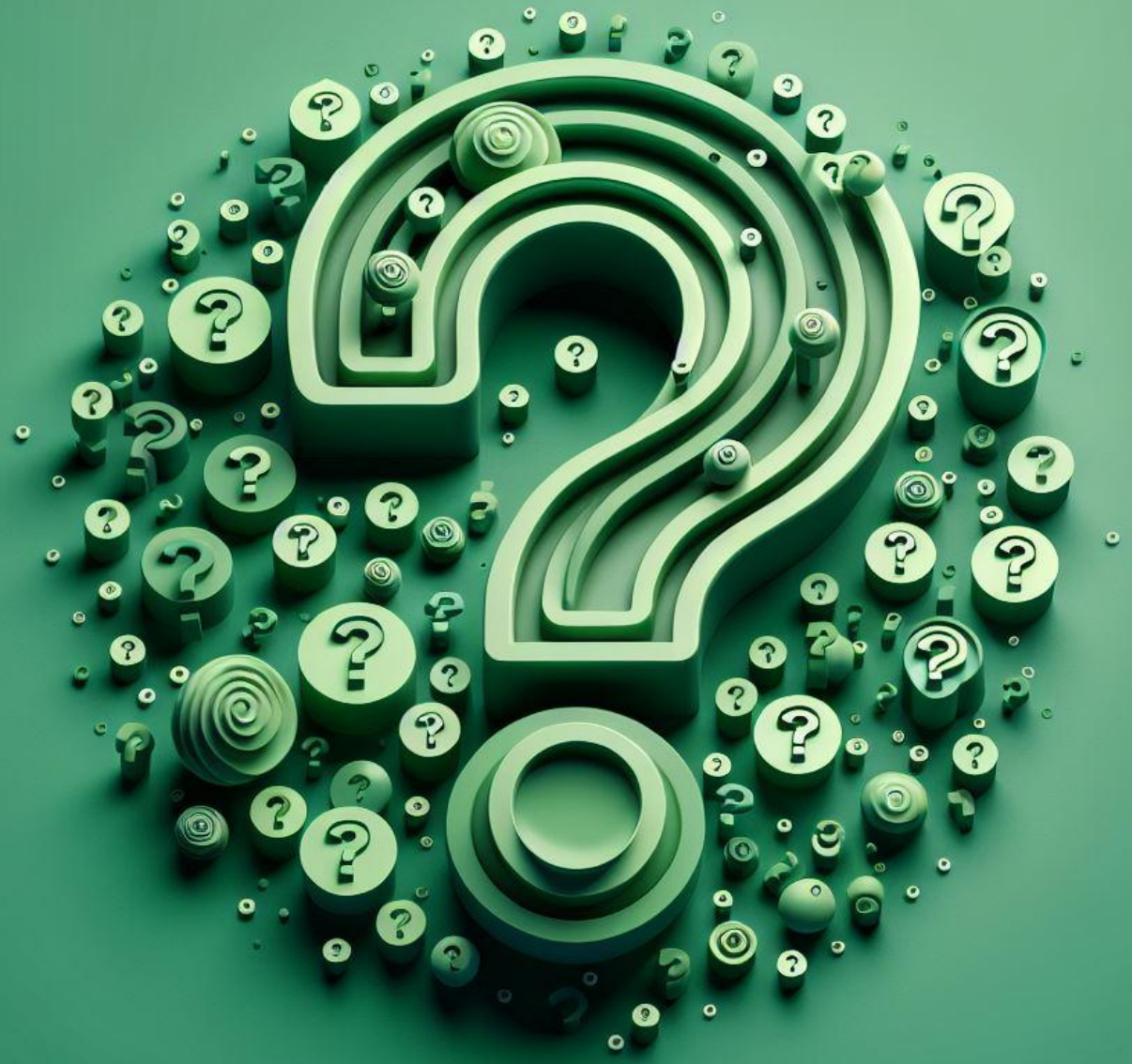
All figures kg CO_2e/m^3 Bounding figures are only applicable to specified strength class



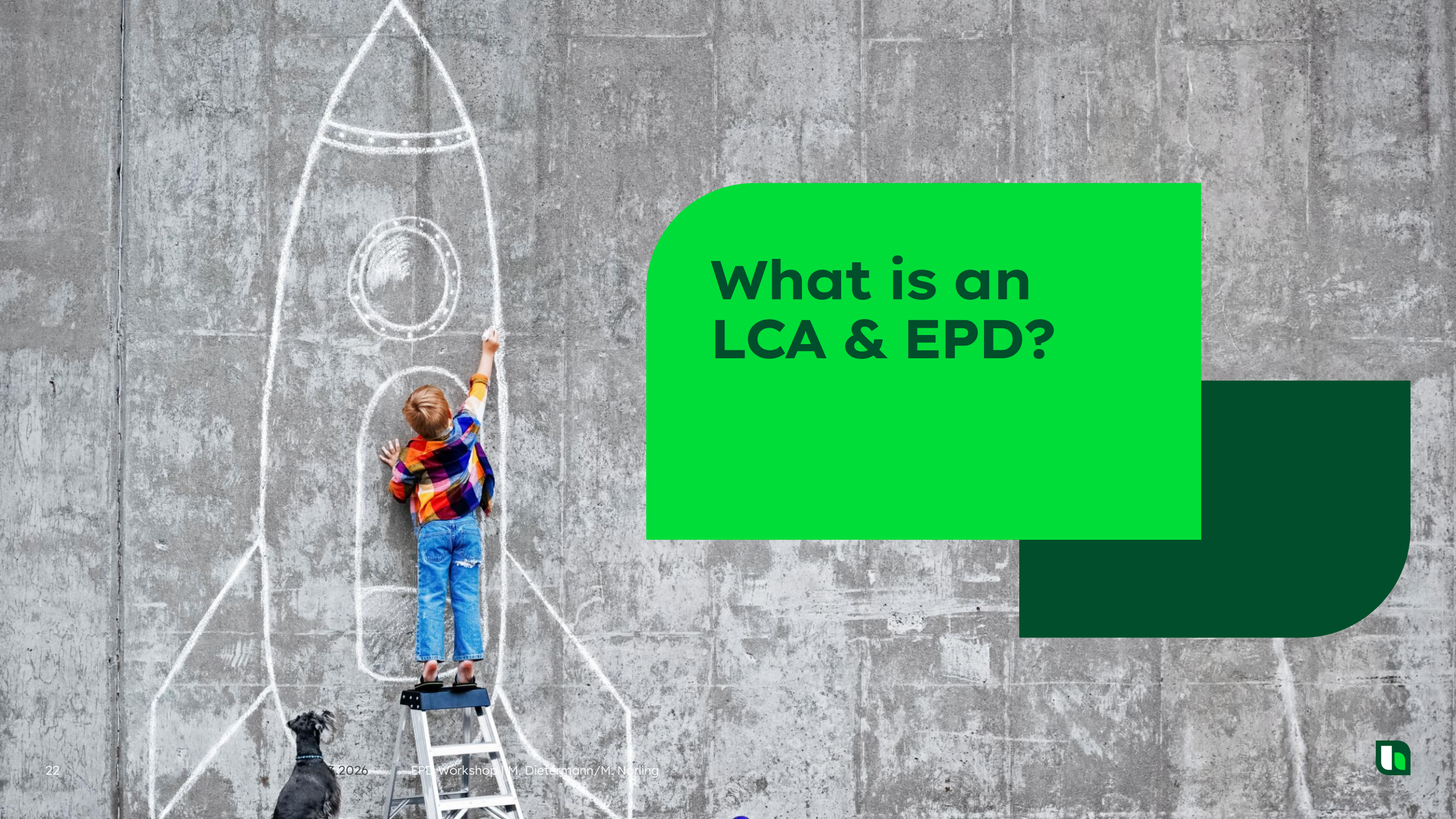
Ticket Date	Supply Plant	Mix Type	Volume (m3)	Carbon ($kgCO_2e/m^3$)	GCCA
01/11/2024	3204 OXFORD	C32/40	7	164.7	D
01/11/2024	3204 OXFORD	C32/40	7	165.1	D
20/11/2024	3204 OXFORD	C32/40	7	163.3	D
20/11/2024	3204 OXFORD	C32/40	2	169.6	D
20/11/2024	3204 OXFORD	C32/40	7	166.1	D
20/11/2024	3204 OXFORD	C32/40	7	166.1	D
20/11/2024	3204 OXFORD	C32/40	7	165.2	D

Ready-Mixed Concrete

- EPDs need to be verified – as such there is a time and cost factor
- At project tender and quotation stage, customers want to know the A1-A3 GWP numbers on many different concrete mixes
- Heidelberg Materials calculates and provides verified indicative A1-A3 Gross GWP number for each mix line on its quotes
- Post-delivery: Carbon scorecard can be provided. Customers can report actual carbon intensity on a project



Any questions?



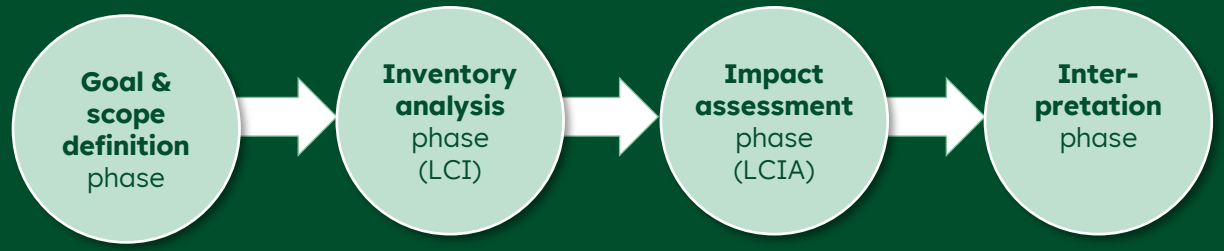
What is an LCA & EPD?

Life Cycle Assessment - The Foundation of Environmental Product Declarations

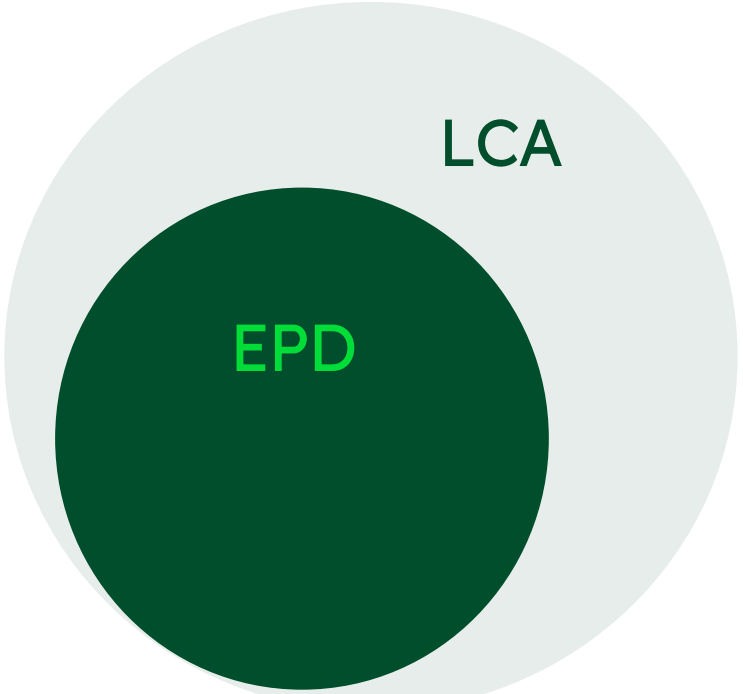
> Compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle

ISO 14040:2006

Key phases of LCA:



LCA encompasses and enables EPDs



Environmental Product Declarations (EPDs)

EPDs are a standardised approach to communicating environmental performance

- ✓ Type III environmental declarations as defined in **ISO 14025**
- ✓ **Quantified, verified** environmental data for a product
- ✓ Based on life cycle assessment (**LCA**)
- ✓ Developed in accordance with Product Category Rules (**PCRs**)
- ✓ Enable objective and comparable **communication**


epd-norge

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

CEM II/A-LL 42,5 N Schelklingen, 2024

Heidelberg Materials

The Norwegian EPD Foundation

Owner of the declaration
Heidelberg Materials AG

Product
CEM II/A-LL 42,5 N Schelklingen, 2024

Declared unit
1 tonne

This declaration is based on Product Category Rules
EN 15804:2012+A2:2019 serves as core PCR
EN 16908:2017 Cement and building lime

Program operator
The Norwegian EPD Foundation

Declaration number
NEPD-11810-11759

Registration number
NEPD-11810-11759

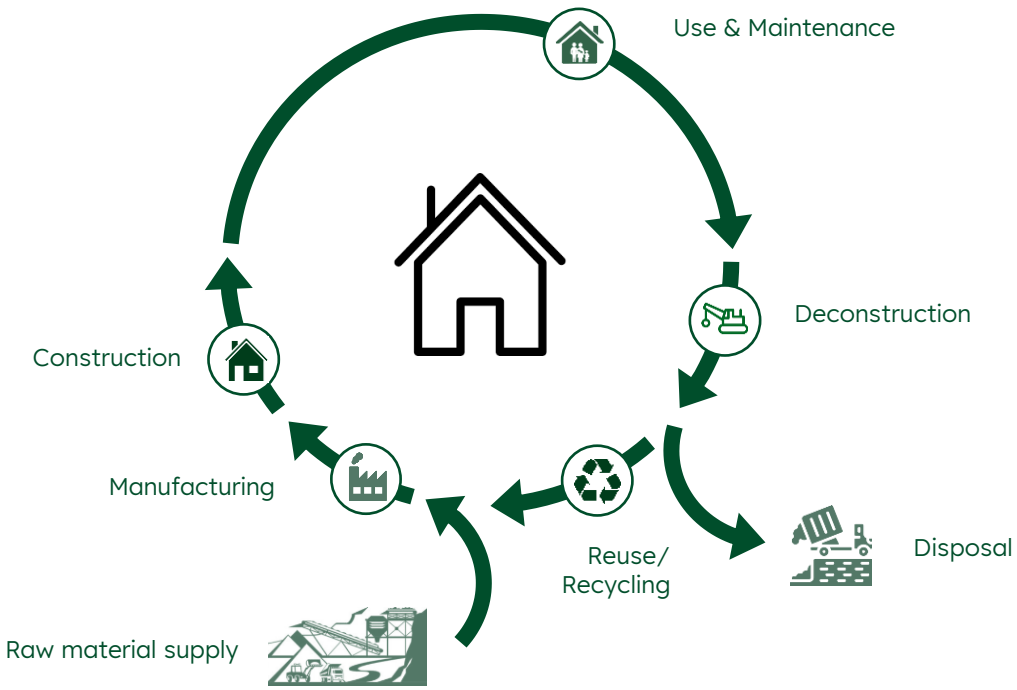
Issue date
14.07.2025

Valid to
14.07.2030

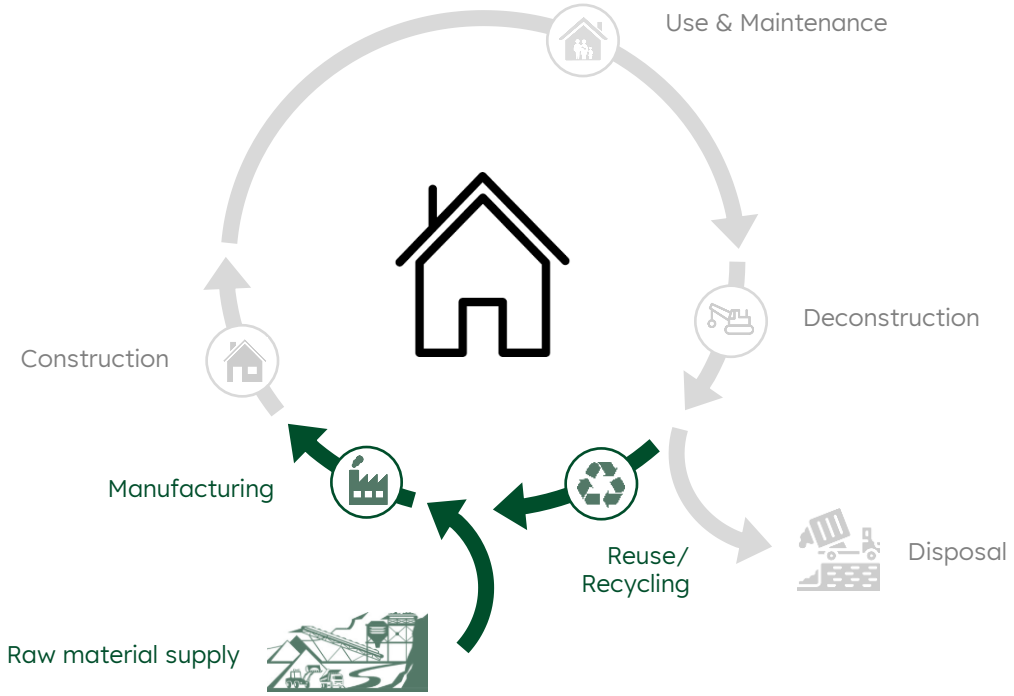
EPD software:
LCA.no EPD generator ID: 1129103

1 / 11

Types of EPD with Respect to Life Cycle Stages Covered



Cradle to grave analysis



Cradle to gate analysis

EPDs transparently communicate environmental performance

Programme operator

Published under **EPD-Norway**

ECO Platform

In accordance with ECO Platform rules

System boundaries

In accordance with relevant PCRs

LCA results

In accordance with relevant PCRs

Declared unit

e.g. 1 tonne of cement, 1 m³ of concrete


epd-norge

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

CEM II/A-LL 42,5 N Schelklingen, 2024

Heidelberg Materials

The Norwegian EPD Foundation

Owner of the declaration
Heidelberg Materials AG

Product
CEM II/A-LL 42,5 N Schelklingen, 2024

Declared unit
1 tonne

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Issue date
14.07.2025

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14.07.2030

EPD software:
LCA.no EPD generator ID: 1129103

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

Product stage			Construction installation stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	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	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

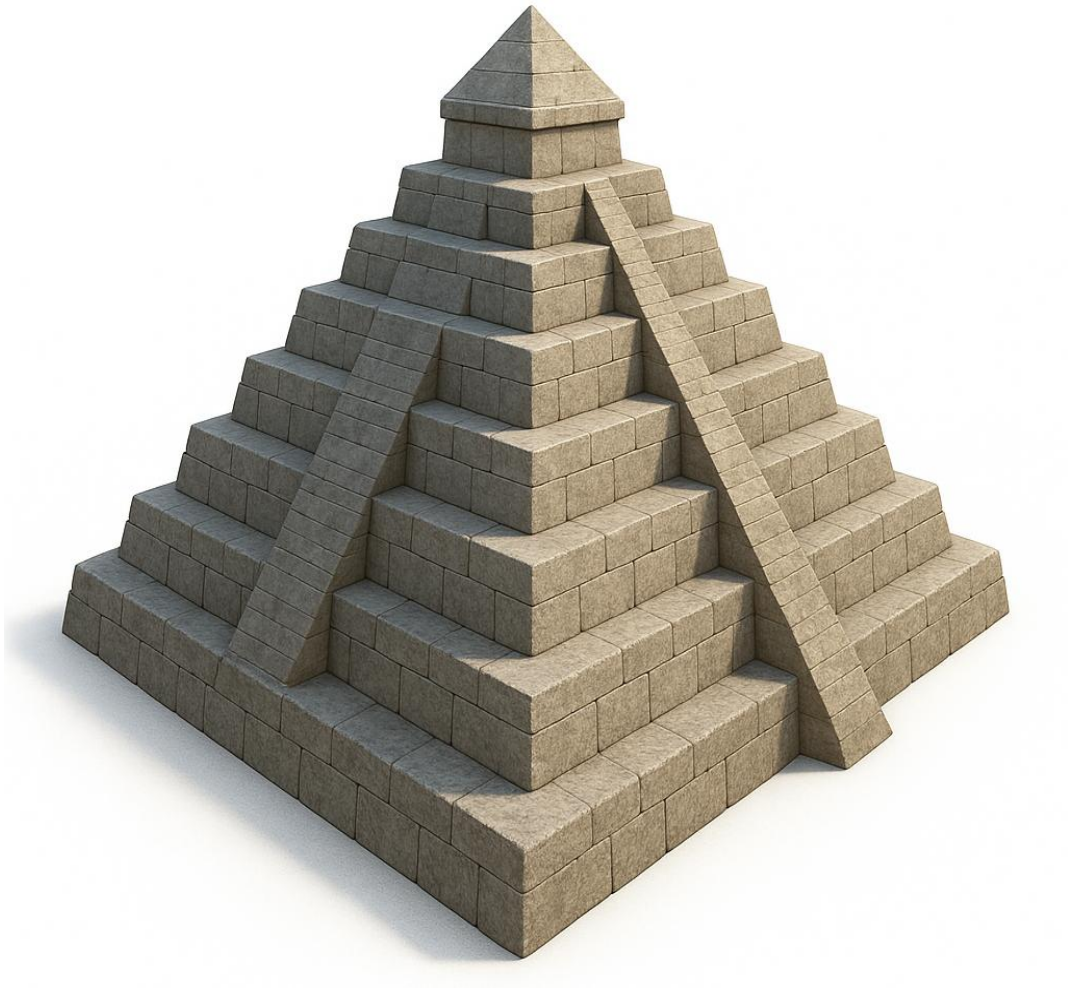
LCA Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Environmental impact				
	Indicator	Unit	A1-A3	A4
	GWP-total	kg CO_2 -eq	6,11E+02	5,68E+00
	GWP-fossil	kg CO_2 -eq	6,06E+02	2,67E+00
	GWP-biogenic	kg CO_2 -eq	4,57E+00	3,00E+00
	GWP-luluc	kg CO_2 -eq	9,05E-02	2,99E-03
	ODP	kg CFC11 -eq	7,44E-07	1,00E-07
	AP	mol H+ -eq	9,89E-01	1,73E-02
	EP-FreshWater	kg P -eq	1,82E-01	5,28E-04
	EP-Marine	kg N -eq	2,25E-01	5,37E-03
	EP-Terrestial	mol N -eq	2,35E+00	5,83E-02
	POCP	kg NMVOC -eq	5,81E-01	2,50E-02
	ADP-minerals&metals[1]	kg Sb-eq	2,39E-03	2,31E-05
	ADP-fossil[1]	MJ	2,08E+03	5,35E+01
	WDP[1]	m^3	1,60E+01	1,11E+00

Standards & Rules

EPD generation is a standardised process



Complementary Product Category Rules (c-PCRs)

Rules for a specific product of a product category, e.g. **EN 16908, EN 16757**

Product Category Rules (PCRs)

Core rules for a specific product category, e.g. **EN 15804**

General Programme Instructions (GPIs)

Regulation on programme administration and operation

ECO Platform standards

LCA calculation rules and Verification guidelines

EPD standards

ISO 14025, ISO 14026, ISO/TS 14027, ISO/TS 14029

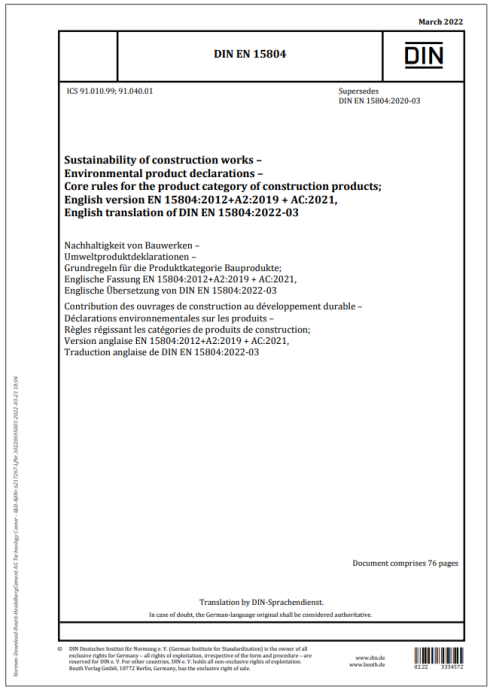
LCA standards

ISO 14040, ISO 14044, ISO 14067, ISO 14071

Organisational standards

ISO 9001, ISO/IEC 17029:2019-10, ISO 14065, ISO/IEC 17065

EPD Generation is a Standardized Process



March 2022

DIN EN 15804

DIN

ICS 91.010.99; 91.040.01

Supersedes
DIN EN 15804:2020-03

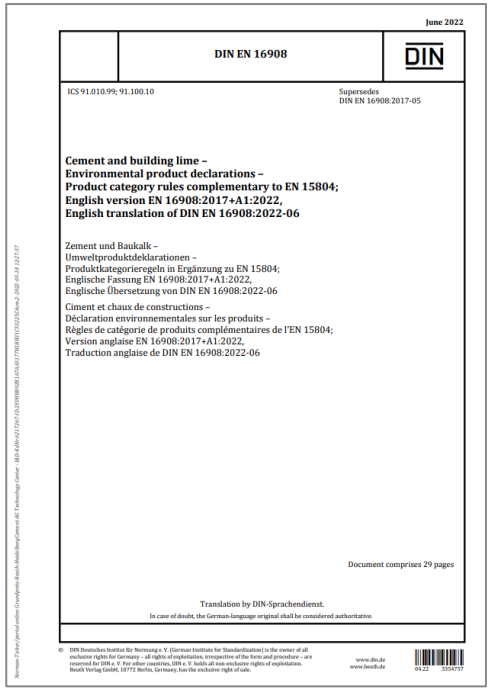
**Sustainability of construction works –
Environmental product declarations –
Core rules for the product category of construction products;
English version EN 15804:2012+A2:2019 + AC:2021,
English translation of DIN EN 15804:2022-03**

Nachhaltigkeit von Bauwerken –
Umweltproduktdeklarationen –
Grundregeln für die Produktkategorie Bauprodukte;
Englische Fassung EN 15804:2012+A2:2019 + AC:2021,
Englische Übersetzung von DIN EN 15804:2022-03

Contribution des ouvrages de construction au développement durable –
Déclarations environnementales sur les produits –
Règles régissant les catégories de produits de construction;
Version anglaise EN 15804:2012+A2:2019 + AC:2021,
Traduction anglaise de DIN EN 15804:2022-03

Document comprises 76 pages

Translation by DIN-Sprachendienst.
In case of doubt, the German-language original shall be considered authoritative.



June 2022

DIN EN 16908

DIN

ICS 91.010.99; 91.100.10

Supersedes
DIN EN 16908:2017-05

**Cement and building lime –
Environmental product declarations –
Product category rules complementary to EN 15804;
English version EN 16908:2017+A1:2022,
English translation of DIN EN 16908:2022-06**

Zement und Baukalk –
Umweltproduktdeklarationen –
Produktkategorieregeln in Ergänzung zu EN 15804;
Englische Fassung EN 16908:2017+A1:2022,
Englische Übersetzung von DIN EN 16908:2022-06

Ciment et chaux de constructions –
Déclaration environnementales sur les produits –
Règles de catégorie de produits complémentaires de l'EN 15804;
Version anglaise EN 16908:2017+A1:2022,
Traduction anglaise de DIN EN 16908:2022-06

Document comprises 29 pages

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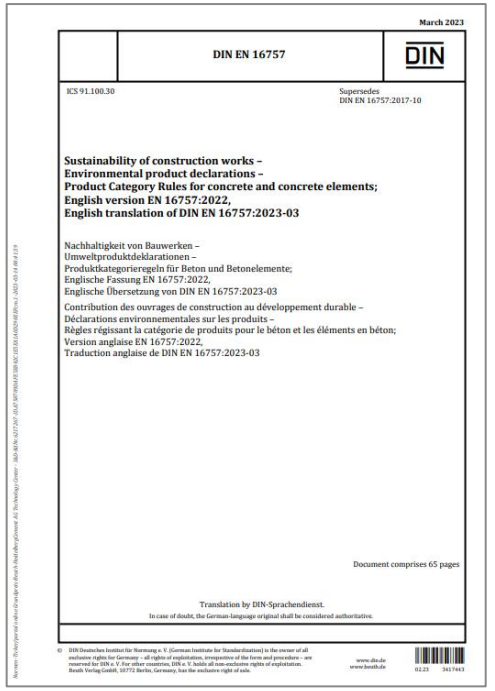

March 2023

DIN EN 16757

DIN

ICS 91.100.30

Supersedes
DIN EN 16757:2017-10

**Sustainability of construction works –
Environmental product declarations –
Product Category Rules for concrete and concrete elements;
English version EN 16757:2022,
English translation of DIN EN 16757:2023-03**

Nachhaltigkeit von Bauwerken –
Umweltproduktdeklarationen –
Produktkategorieregeln für Beton und Betonelemente;
Englische Fassung EN 16757:2022,
Englische Übersetzung von DIN EN 16757:2023-03

Contribution des ouvrages de construction au développement durable –
Déclarations environnementales sur les produits –
Règles régissant la catégorie de produits pour le béton et les éléments en béton;
Version anglaise EN 16757:2022,
Traduction anglaise de DIN EN 16757:2023-03

Document comprises 65 pages

Translation by DIN-Sprachendienst.
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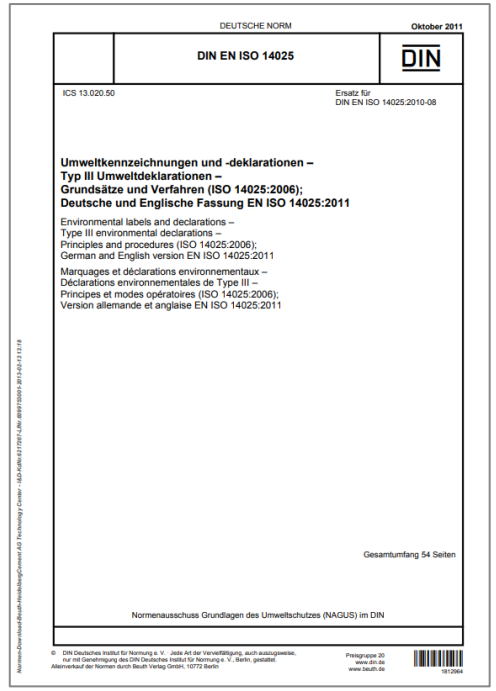


DEUTSCHE NORM

Oktober 2011

DIN EN ISO 14025

DIN

ICS 13.020.50

Ersatz für
DIN EN ISO 14025:2010-08

**Umweltkennzeichnungen und -deklarationen –
Typ III Umweltdeklarationen –
Grundsätze und Verfahren (ISO 14025:2006);
Deutsche und Englische Fassung EN ISO 14025:2011**

Environmental labels and declarations –
Type III environmental declarations –
Principles and procedures (ISO 14025:2006);
German and English version EN ISO 14025:2011

Marquages et déclarations environnementaux –
Déclarations environnementales de Type III –
Principes et modes opératoires (ISO 14025:2006);
Version allemande et anglaise EN ISO 14025:2011

Gesamtumfang 54 Seiten

Normenausschuss Grundlagen des Umweltschutzes (NAGUS) im DIN

EN 15804

Sustainability of construction works – Environmental product declarations – Core rules for the product category of **construction products**

EN 16908

Cement and building lime – Environmental product declarations – Product category rules complementary to EN 15804

EN 16757

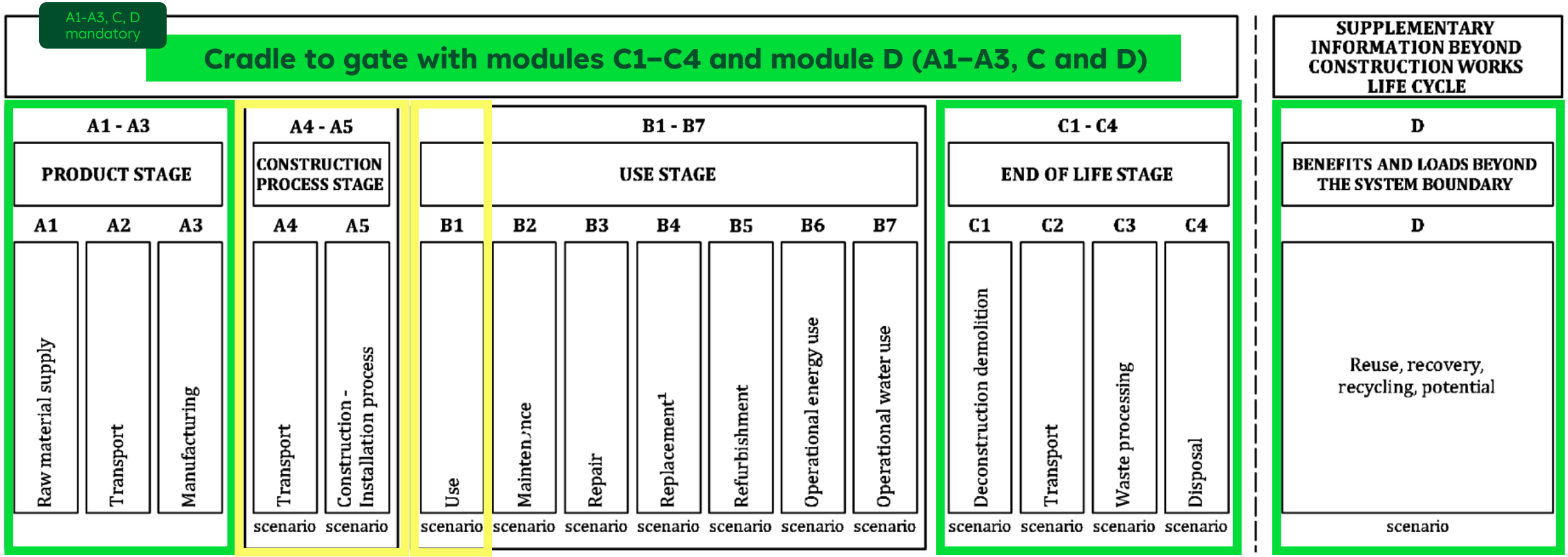
Sustainability of construction works – Environmental product declarations – Product Category Rules for **concrete** and concrete elements

ISO 14025

Environmental labels and declarations – **Type III environmental declarations** – Principles and procedures

EN 15804

EN 15804 Specifies the Core Rules for Construction Products



EN 15804

EN 15804 Defines 13 Core Environmental Impact Indicators

1	Climate change - total (GWP-total)	kg CO_2 eq.
2	Climate change - fossil (GWP-fossil)	kg CO_2 eq.
3	Climate change - biogenic (GWP-biogenic)	kg CO_2 eq.
4	Climate change - land use and land use change (GWP-luluc)	kg CO_2 eq.
5	Ozone depletion (ODP)	kg CFC 11 eq.
6	Acidification (AP)	mol H^+ eq.
7	Eutrophication aquatic freshwater (EP-freshwater)	kg P eq.
8	Eutrophication aquatic marine (EP-marine)	kg N eq.
9	Eutrophication terrestrial (EP-terrestrial)	mol N eq.
10	Photochemical ozone formation (POCP)	kg NMVOC eq.
11	Depletion of abiotic resources – minerals and metals (ADP-minerals&metals)	kg Sb eq.
12	Depletion of abiotic resources – fossil fuels (ADP-fossil)	MJ, net calorific value
13	Water use (WDP)	m^3 world eq. deprived

EN 15804

EN 15804 – It's More Than 13 Environmental Impacts Indicators

13 core environmental impact indicators

Additional environmental impact indicators
Potential incidence of disease due to PM emissions (PM)
Potential Human exposure efficiency relative to U235 (IRP)
Potential Comparative Toxic Unit for ecosystems (ETP-fw)
Potential Comparative Toxic Unit for humans (HTP-c)
Potential Comparative Toxic Unit for humans (HTP-nc)
Potential soil quality index (SQP)

Information describing waste categories
Hazardous waste disposed
Non-hazardous waste disposed
Radioactive waste disposed

Information describing output flow
Components for re-use
Materials for recycling
Materials for energy recovery
Exported energy electrical
Exported energy thermal

Indicators describing resource use
Use of renewable primary energy excluding renewable primary energy resources used as raw materials
Use of renewable primary energy resources used as raw materials
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials
Use of non-renewable primary energy resources used as raw materials
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)
Use of secondary material
Use of renewable secondary fuels
Use of non-renewable secondary fuels
Net use of fresh water

Information describing biogenic carbon content at the factory gate
Biogenic carbon content in product
Biogenic carbon content in accompanying packaging

Σ **39** indicators to be declared

Good to Know

- ✓ GWP: Net vs. Gross
- ✓ Biogenic CO_2 Emissions

Why Do Some EPDs Declare Net GWP, Others Gross GWP — or Even Both?

GWP: Net vs. Gross – What's the Difference?

- ✓ The distinction arises from the use of waste-derived fuels.
- ✓ GWP, gross includes emissions from the combustion of waste fuels.
- ✓ GWP, net excludes these emissions, assuming the waste burden is outside the product system.
- ✓ The waste status of the fuels must be proven and documented.

→ **"polluter pays principle"**

Additional GWP indicators in accordance with cPCR and more transparent reporting related to CCS		
Indicator	**Unit**	**A1-A3**
GWP-total, gross	kg CO_2 -eq	5,22E+02
GWP-fossil, gross	kg CO_2 -eq	5,18E+02
GWP-biogenic, gross	kg CO_2 -eq	3,63E+00
GWP-luluc, gross	kg CO_2 -eq	7,99E-02
GWP-total, net	kg CO_2 -eq	4,05E+02
GWP-fossil, net	kg CO_2 -eq	4,02E+02
GWP-biogenic, net	kg CO_2 -eq	3,63E+00
GWP-luluc, net	kg CO_2 -eq	7,99E-02
CWRS	kg CO_2 -eq	0,00E+00
CWNRS	kg CO_2 -eq	1,16E+02
CC	kg CO_2	3,36E+02
CCS	kg CO_2	0,00E+00

GWP-total, gross = Global Warming Potential total, gross (GWP-fossil, gross + GWP-biogenic, gross + GWP-luluc); GWP-fossil, gross = Global Warming Potential fossil, gross; GWP-biogenic, gross = Global Warming Potential biogenic, gross; GWP-luluc = Global Warming Potential land use and land use change; GWP-total, net = Global Warming Potential total, net (GWP-total, gross minus CWRS and CWNRS); GWP-fossil, net = Global Warming Potential fossil, net (GWP-fossil, gross minus CWNRS); GWP-biogenic, net = Global Warming Potential biogenic, net (GWP- biogenic, gross minus CWRS); CWRS = Emissions from combustion of waste from renewable sources; CWNRS = Emissions from combustion of waste from non-renewable sources; CC = Emissions from decarbonization of limestone in clinkering (process emissions, clinker); CCS = Amount of carbon reductions from carbon capture and storage considered in the main results of the EPD

"The **"polluter pays principle"**: Processes of waste processing shall be assigned to the product system that generates the waste until the end-of-waste state is reached."

EN 15804, 6.3.5.1

EN 16908, Annex F "Application of the polluter pays principle"

As long as the end-of-waste state has not been reached, alternative fuels are waste fuels. This is the case if the waste is legally defined as waste when used, and the use of waste is permitted and regulated under **European and/or national waste legislation** as applicable → **waste code**

Who declares what?

System that **generates the waste** declares:

- environmental impact from waste processing e.g. incineration in the module where the waste is generated, or if end of life in module C3
- exported energy in the module where the waste is generated; and
- substitution benefits in module D

System that **uses the waste** does not declare:

- impacts from waste processing e.g. co-incineration of waste

Declares:

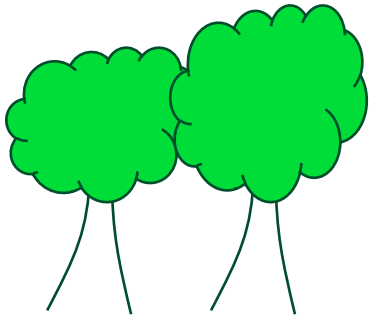
- use of imported energy from the waste within "use of secondary fuel"

→ **net GWP**

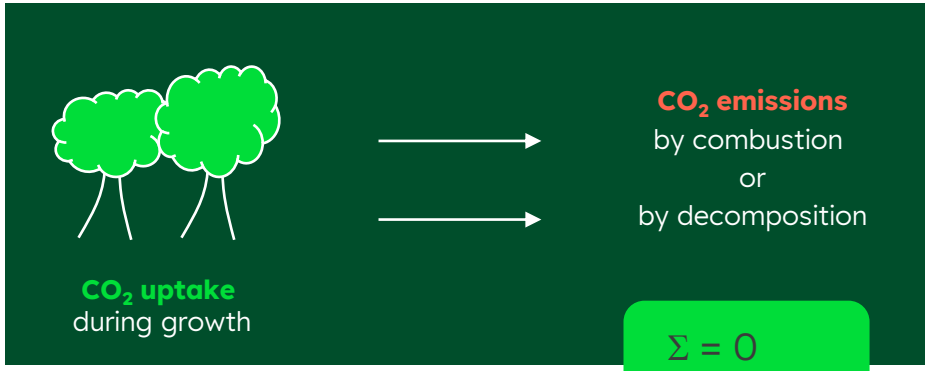
Why Aren't Biogenic CO_2 Emissions Considered in EPDs?

"Biogenic CO_2 emissions can be compensated by re-growth of biomass in the short term. Therefore, CO_2 emissions from biomass fuels (secondary fuels or waste) and the biogenic carbon content of mixed fuels (secondary fuels or waste) shall not be included in the total CO_2 emissions."

EN 16908, 6.3.5.1



CO_2 uptake
during growth



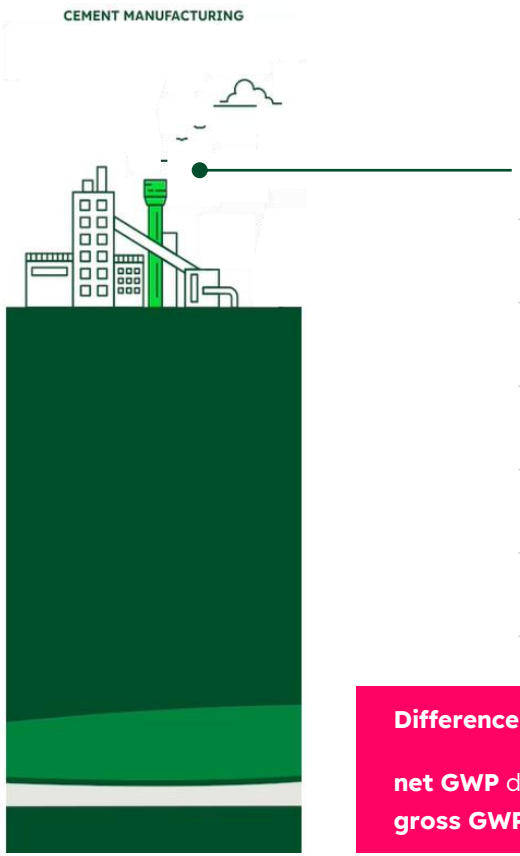
Biogenic CO_2 emissions in the context of carbon capture

Biogenic CO_2 emissions captured and permanently stored are removed from the athmosphere.

→ **EN 15804 does not allow for considering the effect of permanent biogenic carbon storage**

→ Biogenic CO_2 emissions stored are not used for CO_2 accounting in evoBuild or evoZero

Cement Production: Accounting of Direct CO_2 Emissions in EPDs



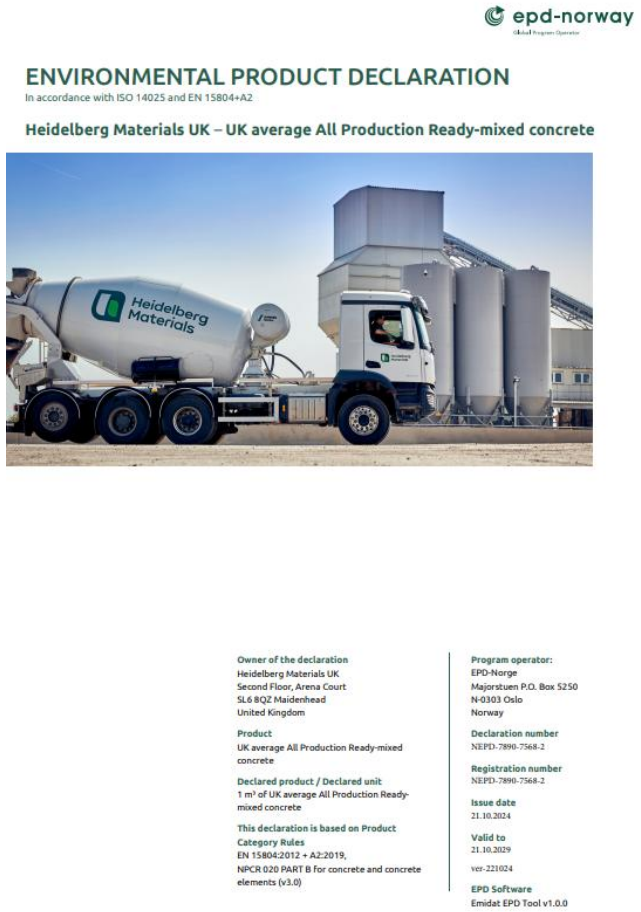
CO_2 sources (direct emissions)	Consideration in product EPDs: net GWP	gross GWP
CO_2 from calcination	✓	✓
CO_2 from combustion of fossil primary fuels	✓	✓
CO_2 from combustion of fossil waste	✗ 1)	✓ 2)
CO_2 from combustion of biogenic primary fuels	✗ 3)	✗ 3)
CO_2 from combustion of biogenic waste	✗ 1)	✗ 3)

Difference between net GWP and gross GWP

net GWP doesn't account for the combustion emissions from waste fuels,
gross GWP accounts for the combustion emissions from waste fuels.

1) CO_2 and non-CO_2 emissions are not considered.
2) CO_2 and non-CO_2 emissions are considered.
3) Non-CO_2 GHG emissions are considered and contribute to GWP.

HM UK Ready-mixed concrete EPDs



epd-norway

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and EN 15804+A2

Heidelberg Materials UK – UK average All Production Ready-mixed concrete

Owner of the declaration
Heidelberg Materials UK
Second Floor, Arena Court
SL6 8QZ Maidenhead
United Kingdom

Product
UK average All Production Ready-mixed concrete

Declared product / Declared unit
1 m³ of UK average All Production Ready-mixed concrete

This declaration is based on Product Category Rules
EN 15804:2012 + A2:2019,
NPCR 020 PART B for concrete and concrete elements (v3.0)

Program operator:
EPD-Norge
Majorstuen P.O. Box 5250
N-0303 Oslo
Norway

Declaration number
NEPD-7890-7568-2

Registration number
NEPD-7890-7568-2

Issue date
21.10.2024

Valid to
21.10.2029

ver-221024

EPD Software
Emidat EPD Tool v1.0.0

Core environmental impact indicators

Indicator	Unit	A1-3	A4	A5	B1	C1	C2	C3	C4	D
GWP-total	kg CO_2-eq.	149.28 (135.49)*	2.16	9.58	-5.63	14.22	12.02	13.17	1.07	-21.55
GWP-fossil	kg CO_2-eq.	148.92 (135.15)*	2.16	9.56	-5.63	14.21	12.01	13.17	1.07	-21.51
GWP-biogenic	kg CO_2-eq.	0.31 (0.29)*	1.1e-03	0.01	0	1.4e-03	6.0e-03	1.3e-03	1.1e-04	-0.02
GWP-luluc	kg CO_2-eq.	0.05	7.7e-04	2.5e-03	0	1.2e-03	4.3e-03	1.1e-03	5.6e-04	-0.02
ODP	kg CFC-11-Eq	2.8e-06	4.5e-08	1.8e-07	0	2.2e-07	2.5e-07	2.0e-07	3.1e-08	-1.7e-07
AP	mol H+-Eq	0.49	5.1e-03	0.07	0	0.13	0.03	0.12	7.6e-03	-0.13
EP-freshwater	kg P-Eq	0.02	1.5e-04	6.1e-04	0	4.1e-04	8.5e-04	3.8e-04	8.9e-05	-6.6e-03
EP-marine	kg N-Eq	0.06	1.3e-03	0.03	0	0.06	7.4e-03	0.06	2.9e-03	-0.03
EP-terrestrial	mol N-Eq	1.30	0.01	0.31	0	0.65	0.08	0.60	0.03	-0.38
POCP	kg NMVOC-Eq	0.38	8.9e-03	0.09	0	0.19	0.05	0.18	0.01	-0.10
ADPE	kg Sb-Eq	2.3e-04	6.2e-06	9.7e-06	0	5.1e-06	3.4e-05	4.7e-06	1.7e-06	-1.2e-04
ADPF	MJ, net calorific value	1058.46	32.45	126.14	0	185.93	180.29	172.25	26.32	-258.11
WDP	m³ world Eq deprived	16.92	0.16	0.72	0	0.46	0.91	0.42	0.07	-32.19

GWP-total: Global Warming Potential - total **GWP-fossil**: Global warming potential - fossil **GWP-biogenic**: Global Warming Potential - biogenic **GWP-luluc**: Global Warming Potential - luluc **ODP**: Depletion potential of the stratospheric ozone layer **AP**: Acidification potential, Accumulated Exceedance **EP-freshwater**: Eutrophication potential - freshwater **EP-marine**: Eutrophication potential - marine **EP-terrestrial**: Eutrophication potential - terrestrial **POCP**: Photochemical Ozone Creation Potential **ADPE**: Abiotic depletion potential - non-fossil resources **ADPF**: Abiotic depletion potential - fossil resources **WDP**: Water (user) deprivation potential

HM UK CEM I EPD

Heidelberg Materials

PDF
B577C918.pdf

LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE OR INDICATOR 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	MND	MND	MND

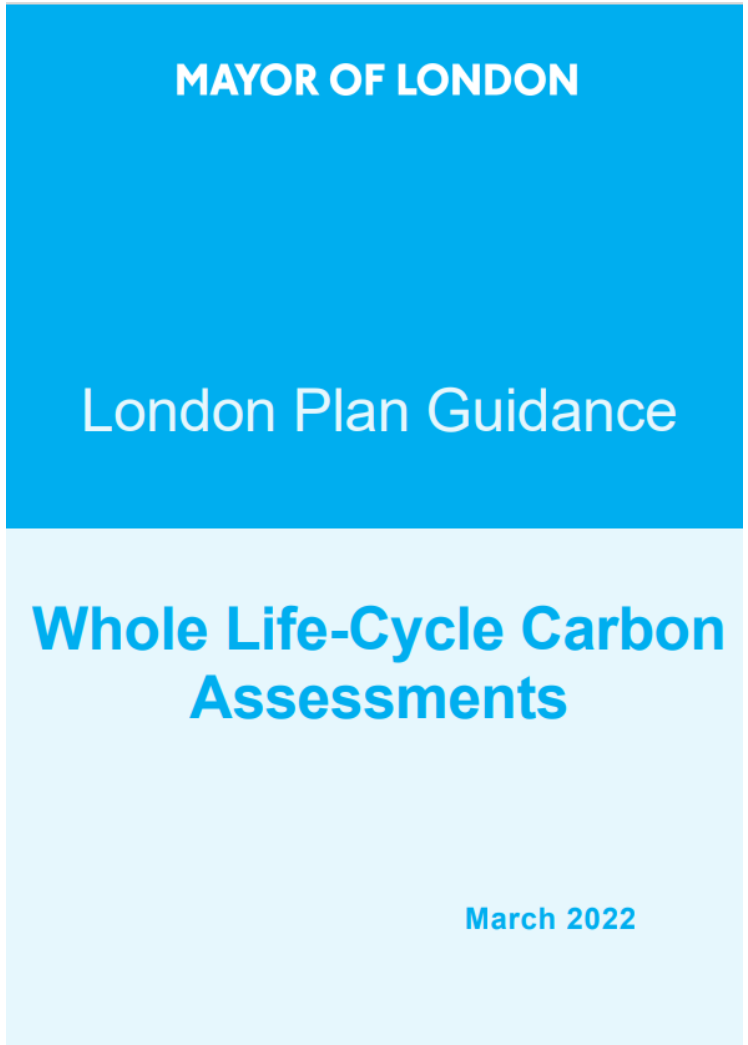
RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 tonne Portland Cement CEM I 52.5N

Parameter	Unit	A1-A3
Global Warming Potential total (GWP-total)	kg CO_2 eq	6.93E+02
Global Warming Potential fossil fuels (GWP-fossil)	kg CO_2 eq	6.92E+02
Global Warming Potential biogenic (GWP-biogenic)	kg CO_2 eq	1.74E-01
Global Warming Potential luluc (GWP-luluc)	kg CO_2 eq	2.91E-02
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC11 eq	1.82E-05

Soil quality index (SQP)	SQP	6.93E+02

Remark to Global warming potential: For all GWP indicators in A1 – A3 net values are reported. The waste status of all (waste--based) fuels has been proven. Gross emissions (i.e. including CO2 from combustion of proven wastes) are 804.3 kg CO2-Eq. / t (GWP--total), 804.0 kg CO2-Eq. / t (GWP--fossil), 0.3278 kg CO2-Eq. / t (GWP--biogenic).

EPD and carbon data

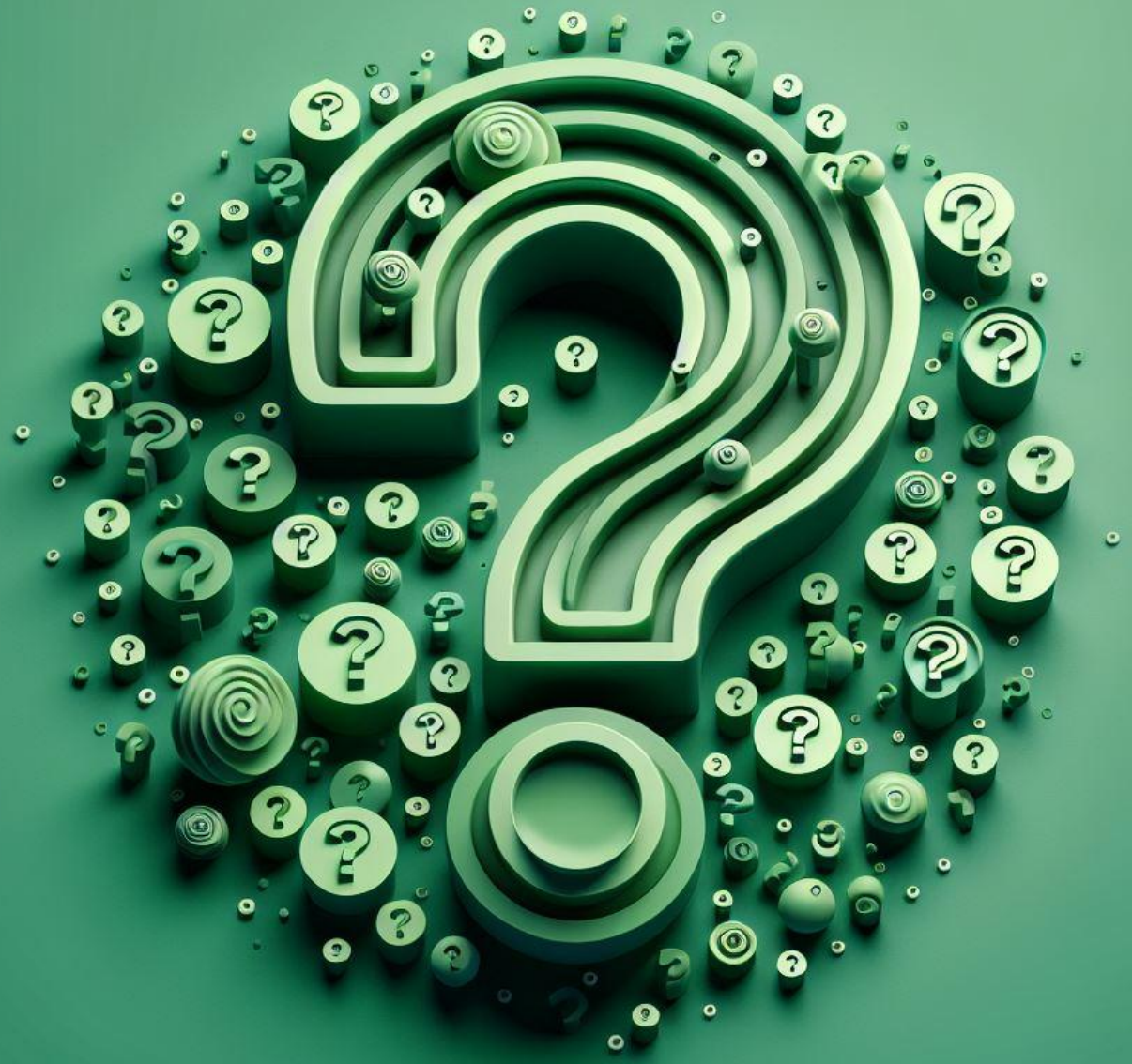


2.7 Materials and products

Acceptable sources of carbon data for materials and products

2.7.1 The following are acceptable sources of carbon data for materials and products (or the latest available versions) in order of preference:

- verified Type III EPDs in accordance with BS EN 15804 2012+A1:2013 or A2:2019
- verified Type III EPDs in accordance with ISO 21930: 2017
- verified Type III EPDs in accordance with ISO 21930: 2007
- third-party (independently) verified, or peer-reviewed, carbon emissions to ISO 14067. EN 15804 or ISO 21930:2017 should be used as a CFP-PCR where relevant.
- verified Type III EPDs in accordance with ISO 14025
- peer-reviewed Life-cycle Carbon Assessment studies in accordance with ISO 14044
- independently verified or peer-reviewed carbon emissions to PAS 2050:2011. EN 15804 should be used as the product sector specific requirements where relevant.



Any questions?

SCMs & Carbon Capture Technologies

Heidelberg Materials

Supplementary Cementitious Materials (SCMs): Alternatives to CEM I

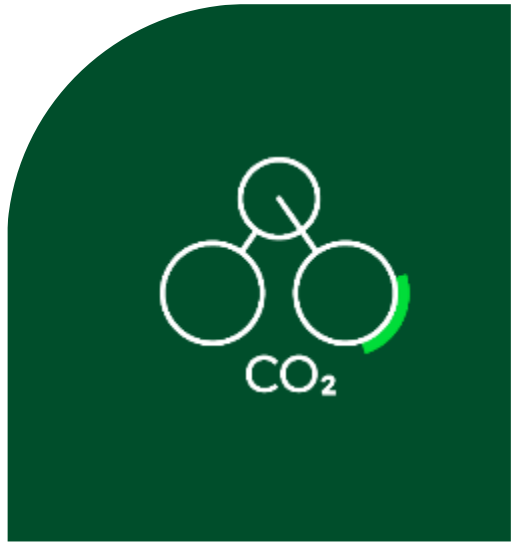
SCM	A1-A3 kg CO_2/t*	Typical (Max) % Replacement of CEM I	UK Availability High Level
Ground Granulated Blastfurnace Slag GGBS	155	50-80 (95)	Heidelberg Materials 10 year secure import supply from developed world excess (x3 import/grinding locations)
Pulverised Fly Ash PFA	22	6-35 (50)	Import only – UK sourced beneficiated ash waste being investigated
Limestone Filler	44	10-15 (35)	Inert material. Widely available in the UK at concrete plants and also as a CEM II A-L blended cement
Calcined Clay	48-274	20-30 (50)	No UK source, import options being developed

*CO2 values; MPA Factsheet 18 2025

Carbon capture and storage

- Utilising carbon capture and storage technology is vital if we are to reach net zero carbon emissions by 2050.
- We are involved in a number of industry-leading projects at our UK cement works:
    - **Padeswood, north Wales:** Investing £400m in a facility to capture 800,000 tonnes of CO_2 a year, transported via the HyNet North West pipeline and storing it safely under the seabed. UK net zero cement as early as 2028.
    - **Ketton, Rutland:** As part of the Government's Net Zero Innovation Portfolio, we trialled C-Capture's solvent technology to selectively capture the CO_2 produced.
    - **Ribblesdale, Lancashire:** We have proved that enforced carbonation of recycled concrete paste allows for high CO_2 uptake, preventing emissions.

The 1st net zero cement facility in the UK, and a global exemplar project.



Concrete Specification & Compliance monitoring

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Specification to BS8500 – How you can reduce carbon

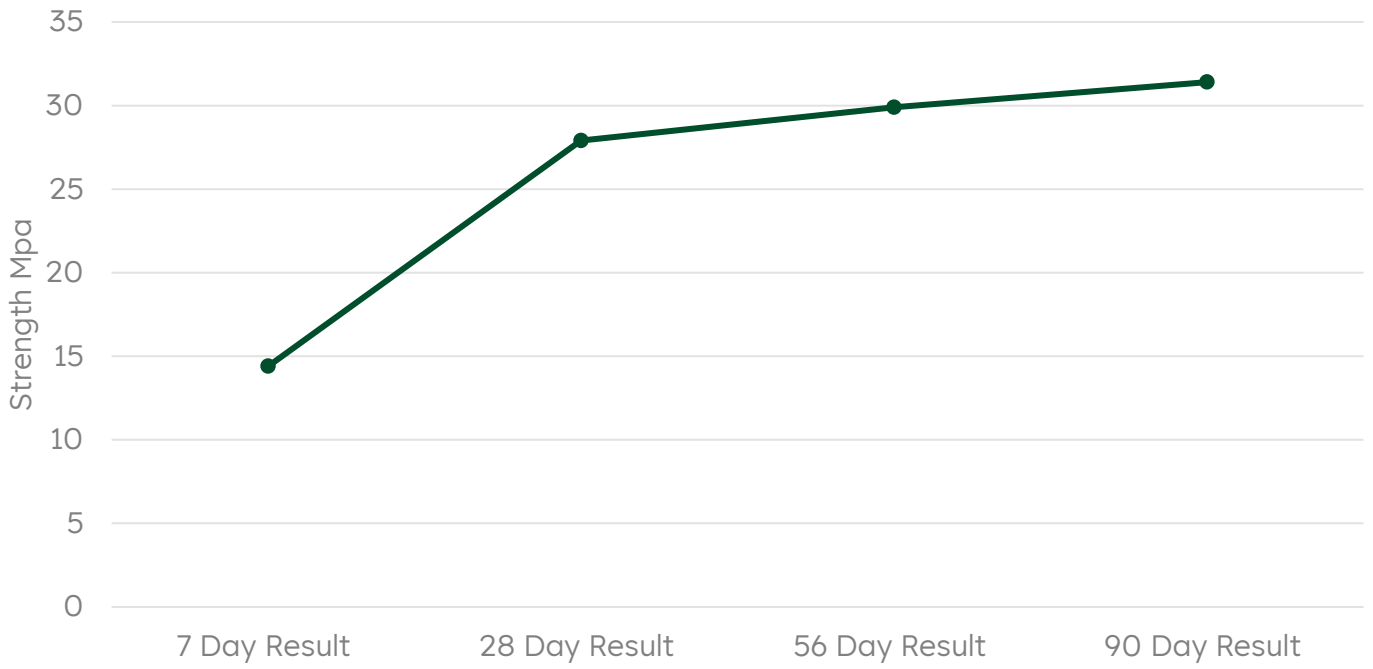
- The carbon impact of durability criteria and Minimum Cement Content (MCC) and Water Cement Ratio (WCR)
- Opportunities to reduce carbon by challenging your designers – before you engage with your concrete supplier

Concrete Strength	Minimum Cement Content	Kg Powder/m^3	Approx CO_2 per m^3
C28/35	None	280	161
C28/35	350	350	194

Concrete Strength	Water Cement Ratio Max	Kg Powder/m^3	Approx CO_2 per m^3
C28/35	None	280	161
C28/35	0.45	335	187

Consider 56 Day Strength Criteria

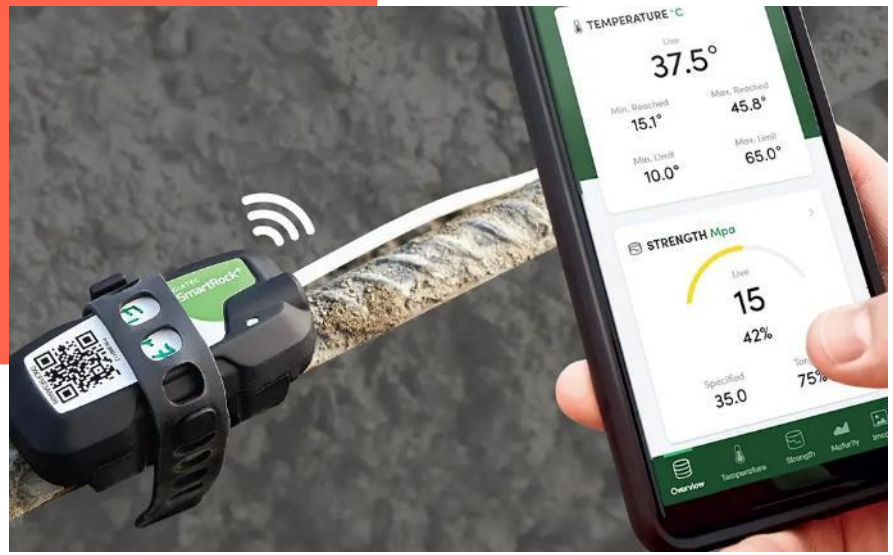
- Specifying concrete strength at 56 days, rather than the traditional 28 days, can reduce embodied carbon.
- In appropriate situations specifying at 56 days should have little or no effect on design.



- Using 56 Day Strengths could save 20kg/m^3 of cement, therefore ~10kg/m^3 CO_2.
- Documents available from MPA, The Concrete Centre, IStructE and being trialled by Highways England

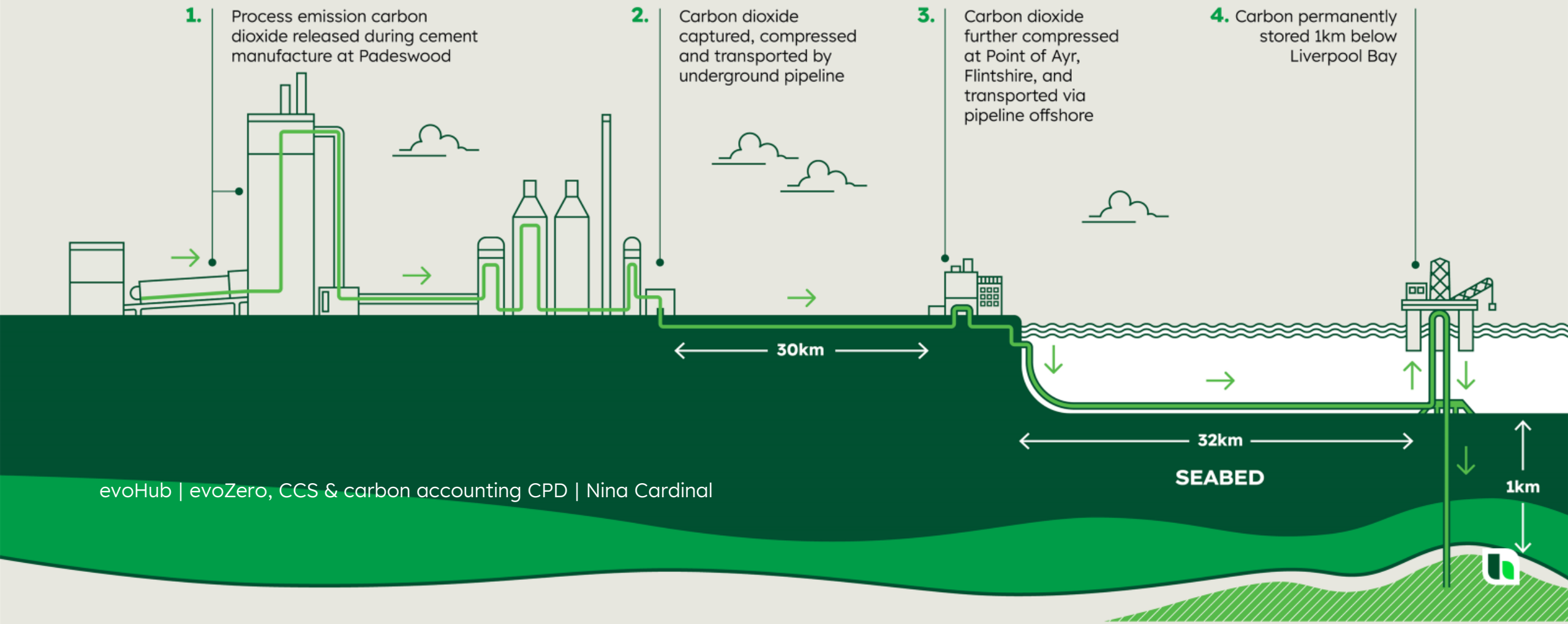
Digital Maturity Sensors

- Saved Laing O'Rourke 34 tonnes of CO_2 at King's Cross Capella
- Saved Mace 14 days from program plan on Heathrow Airport Taxiway
- Provided Buckingham Group evidence of in-situ strength to re-open a Merseyside railway bridge
- Allowed Bouyges to dispense with site cubes for formwork & prop removal at Finsbury Hospital



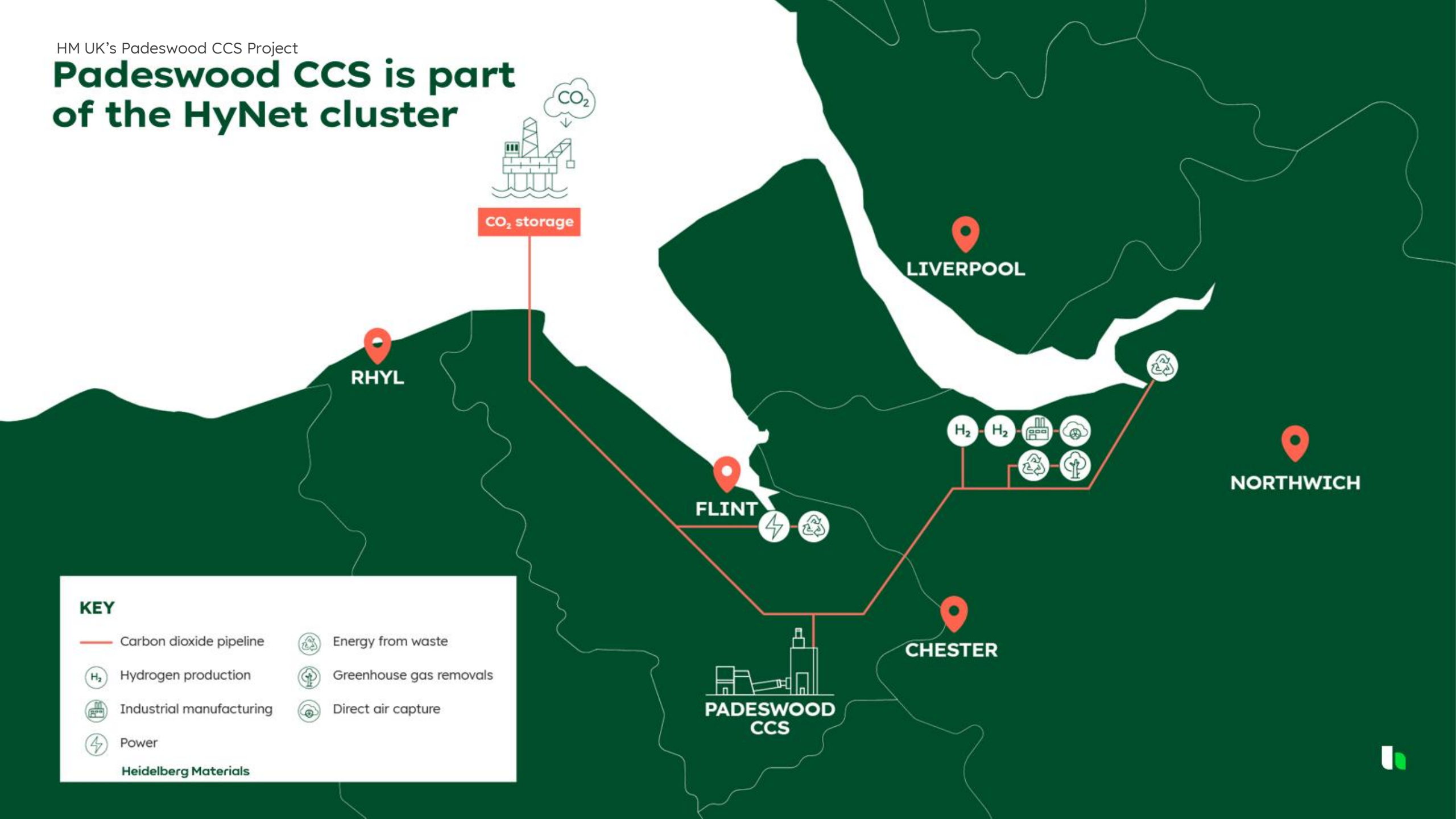

Padeswood carbon capture
and storage (CCS)
THE
WORLD'S
FIRST
The world's first fully decarbonised
cement production process
Heidelberg Materials

What is Padeswood CCS?



HM UK's Padeswood CCS Project

Padeswood CCS is part of the HyNet cluster



Low Carbon evoBuild Concretes – GWP Mapped Against Global Concrete Ratings

evoBuild low carbon concrete 50

GCCA A1-A3 minimum Grade D

evoBuild low carbon concrete 60

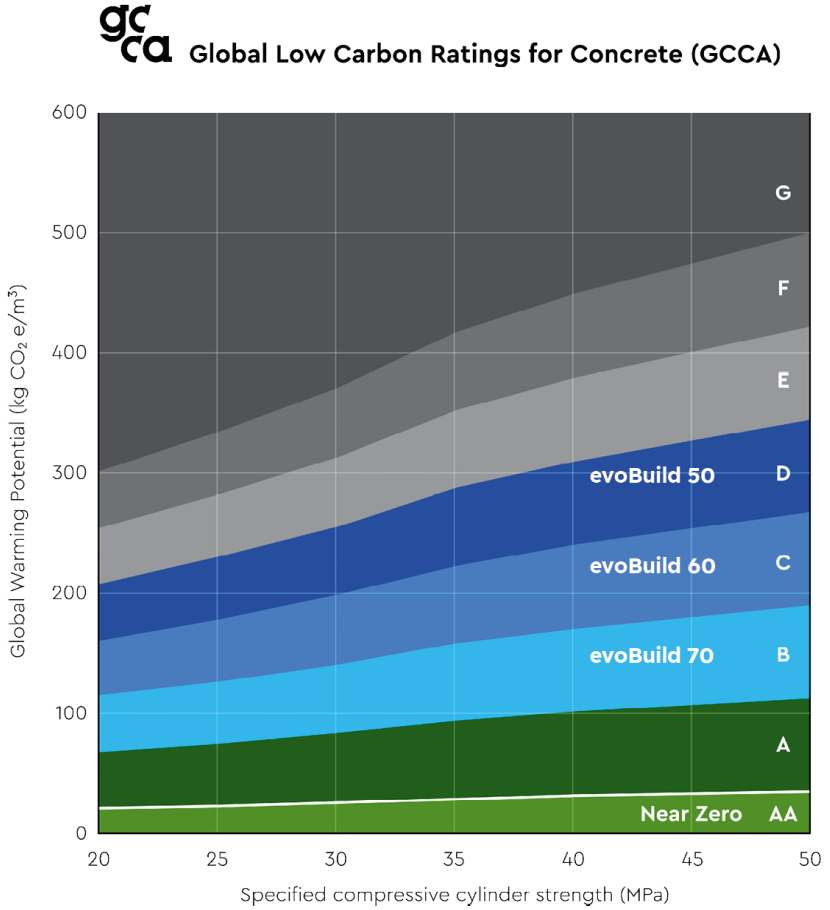
GCCA A1-A3 minimum Grade C

evoBuild low carbon concrete 70

GCCA A1-A3 minimum Grade B

Key benefits:

- Reduces carbon emissions by 50-70% against fixed CO_2/T GCCA reference.
- Verified indicative Global Warming Potential (GWP) values provided
- Behaves like current concretes - unchanged construction process.
- Complies with BS 8500 and BS EN 206-1.
- Available nationally



Thank you for your time.

Any Questions?

If you have any enquires please contact;

EPDs

- Nicola Johnson – Sustainability Business Partner
  - Nicola.johnson@heidelbergmaterials.com

Technical

- Lee Baldwin – Technical Services Manager
  - lee.Baldwin@heidelbergmaterials.com

Heidelberg Materials

Please let us know how we've done!

More CPD topics available from Heidelberg Materials;

- How to specify evoZero, the world's first carbon captured cement
- How to specify evoBuild low carbon concrete
- How to specify evoBuild GGBS, a low carbon cement replacement
- Understanding Environmental Product Declarations (EPDs)