

Carbon Reduction Code for the Built Environment

To facilitate the reduction of carbon emissions (CO₂eq) related to design, construction, maintenance, operation and decommissioning of built assets

Issue 2021:2

October 2021

Carbon Reduction Code for the Built Environment

Issue 2021:2 - October 2021

Introduction

Carbon reduction is more likely to happen when all organisations within a value chain are committed to reducing their footprint and saving costs. This **Carbon Reduction Code for the Built Environment** forms part of the Construction Leadership Council's Construct Zero initiative. It is a first step to facilitate action and collaboration by relevant parties towards reducing carbon emissions (CO₂eq) related to design, construction, maintenance, operation and decommissioning of built assets. It is not intended to replace standards such as PAS 2080 (or equivalent), but it provides a framework for organisations to make a public commitment to and report on progress towards achieving Net Zero.

This framework aligns with the UK Government's Procurement Policy Note (PPN 06/21) for taking account of carbon reduction plans in public procurement¹. The Code was drafted by the CSIC Achieving Net Zero Cross-Industry Working Group in 2020 and first issued in 2021. It is expected that it will be updated as carbon targets change and progress towards net zero carbon is achieved. A process for organisations to commit to the code is detailed separately. The Code has three parts:

1. Core commitments for all organisations
2. Core commitments for client organisations and further commitments to facilitate the transition to Net Zero
3. Core commitments for supply chain organisations and further commitments to facilitate the transition to Net Zero.

There are three levels of compliance to the Code: PLEDGER, SIGNATORY and CHAMPION:

- PLEDGER: This is the minimum level of compliance. All organisations must sign up to commitments 1.1 and 1.2 to be in compliance at a PLEDGER level.
- SIGNATORY: To achieve a SIGNATORY level of compliance, organisations must sign up to 1.1 and 1.2 and all Core Commitments relevant to their organisation (Client 2.1, 2.2, 2.3) (Supply Chain 3.1, 3.2, 3.2, 3.4).
- CHAMPION: To achieve a CHAMPION level of compliance, organisations must sign up to 1.1, 1.2, Core Commitments relevant to their organisation (Client 2.1, 2.2, 2.3) (Supply Chain 3.1, 3.2, 3.2, 3.4) and the Further Commitments relevant to their organisation (Client 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 2.10) (Supply Chain 3.5, 3.6, 3.7, 3.8).

Although, organisations are encouraged to sign up at a global or national level, it is possible for organisations to sign up at a regional or local level. It is also possible for large projects to sign up such as a joint venture with several partners. The level of sign-up must be clearly stated.

Note: In this document, where we refer to carbon we mean CO₂eq; Built Environment refers to all built assets including buildings and infrastructure.

¹ Cabinet Office Action Note PPN 06/21, dated 05/06/2021

The Code

1. Core commitments for all organisations

1.1 We will set out our plans to meet net zero by 2045², including annual targets, recognising that the majority of cuts need to be made by 2030³. We will publish this, and our progress against it, annually.

1.2 We will set an interim target to reduce our net direct and indirect (Scope 1, 2 and where appropriate Scope 3)⁴ carbon emissions for 2030, which aligns with or exceeds government strategy recognising that the preference is to reduce emissions rather than offsetting. * For major projects that end before 2030, a suitable target will be set for the end date of the project.

² As set into law by the Scottish Government in 2019 - <https://www.gov.scot/policies/climate-change/reducing-emissions/>

³ See Note 1 at the end of this document

⁴ Ref. Greenhouse Gas Protocol <https://ghgprotocol.org/>

The Code

2. Client commitments

Clients	Core commitments	Further commitments
Procurement	<p>2.1 We will include carbon reduction targets and reporting commitments explicitly in all our procurement documents, as a deliverable of the procurement process, to move the 'cost-carbon' balance in favour of low carbon choices. This will include capital carbon (product, A1-A3, and construction processes, A4-A5, according to the quantification framework of PAS 2080). We will use PAS 2080 (or equivalent standard) as the reference document for this.</p>	<p>2.4 We will develop with our supply chain outcome-based⁵ specifications and commercial arrangements where possible, ensuring outputs are not constrained to current thinking but encourage low carbon innovations. We commit to ongoing support and engagement with the supply chain to accelerate achievement of the desired outcomes.</p>
Data & Reporting	<p>2.2 We commit to providing a carbon baseline for each of our projects and setting targets for carbon reduction against these, which will drive innovation. We will also include, where appropriate, progressive carbon reduction targets throughout the life of a project and appropriate financial incentives, having regard to the other commitments on the Code⁶. Carbon offsetting should be the last resort and only used when all other carbon reduction efforts are exhausted. Carbon offsetting should follow the Oxford offsetting principles⁷ or equivalent.</p> <p>2.3 We commit to having our carbon data externally verified as part of our reporting requirements e.g. via CEMARS in compliance with ISO 14064-1:2006.</p>	<p>2.5 By 2025 we will have in place a Carbon Data Set, which will be used wholly by the sector. To achieve this, we commit to share our carbon data openly, through a national carbon integrator (where available) and through working with industry.</p>
Learning & Skills		<p>2.6 We commit to implement approaches that improve our capability to measure and reduce embodied and operational carbon:</p> <ul style="list-style-type: none"> • in the design and construction phase; • during the life of existing assets; and • during decommissioning and end-of-life.
Design Philosophy		<p>2.7 We will align our capital and operational investment plans with the national net zero carbon obligation, including retrofitting decarbonisation to our existing asset operations and their use. We will use early-stage optioneering to prioritise no-build and low-build solutions, which optimise existing assets, systems and processes, before new build is considered.</p>
Knowledge Sharing		<p>2.8 As clients, we will work together (with our peers, umbrella industry bodies and our supply chains) to share best practice around our methodologies for carbon measurement and management. By also understanding where we have 'common asset types and activities' we will ensure we all measure and report on the carbon in these assets/activities consistently by 2022.</p> <p>2.9 We will share knowledge and information on the benefits of nature-based solutions for carbon sequestration and increased resilience instead of 'hard engineering' interventions.</p> <p>2.10 We will share our decarbonisation roadmaps both for new and existing assets, with the aim of contributing towards the national net zero carbon transition.</p>

⁵Project 13 <http://www.p13.org.uk/>

⁶Appropriate financial incentives might include contractual mechanisms/outcomes linked to low-carbon targets, such as: bonus structures, KPI regimes, performance failure damages, shared supply-chain incentive regimes, contract price rebates/reductions, pain/gain mechanisms, testing/defect remedies being activated and the required target being a condition of handover/acceptance

⁷<https://www.smithschool.ox.ac.uk/publications/reports/Oxford-Offsetting-Principles-2020.pdf>

The Code

3. Supply chain commitments

Supply Chain	Core commitments	Further commitments
Procurement		3.5 (Contractors) We will proactively support our supply chain to adopt carbon measurement and carbon reduction, and will require them to report on carbon.
Data & Reporting	<p>3.1 We will automate production and delivery of CO₂eq information through design and construction by using integrated approaches to data creation and management. This will inform optimal solutions through the build phase and streamline delivery of information to clients.</p> <hr/> <p>3.2 We will reduce the whole life carbon intensity of our projects within the limits of our influence, year on year (to achieve the long-term targets set out in Point 1.2).</p>	3.6 We will contribute carbon reduction data to a publicly available carbon measurement database for the purposes of benchmarking and performance improvement.
Design Philosophy	<p>3.3 We will proactively recommend and adopt carbon measurement and carbon reduction methodologies in all our projects for both design and construction, including whole-life carbon approaches, regardless of whether the clients are requesting them. We will use PAS 2080 (or equivalent) as the reference document for this.</p> <hr/> <p>3.4 We will work in close collaboration with clients and with our supply chain partners to deliver on the clients' carbon requirements, and inform the development of approaches and standards.</p>	3.7 (Consultants) We will work with clients to consider the carbon hierarchy options before a new build is committed to. Where possible, we will integrate nature-based solutions in the design development and delivery of projects.
Knowledge Sharing		3.8 We commit to sharing our own best practice across the supply chain and learning from and adopting others best practice where possible. (With reference to the Supply Chain Sustainability School ⁸ , and annual reports of the Infrastructure Carbon Review ⁹ .)

⁸<https://www.supplychainschool.co.uk/>

⁹<https://www.gov.uk/government/publications/infrastructure-carbon-review>

Note

Note that in 2026, we will be 20% of the way to 2050, from 2019 (when the UK and Scottish governments wrote climate commitments into law). It is anticipated that we will need to make most of our carbon reductions with existing technologies, rather than relying on new technologies to emerge.

According to the Pareto principle, we need to reach 80% reduction vs 2019 by 2026 in order to reach net zero by 2050 (current UK government law). This implies emissions reductions of ~20% per year:

Residual annual emissions in given year, at given rate of reduction, vs. 2019 emissions						
	10%/yr	12%/yr	15%/yr	18%/yr	20%/yr	25%/yr
2025	53%	47%	38%	31%	27%	18%
2026	48%	41%	32%	25%	21%	14%
2030	32%	25%	17%	12%	9%	4%

Guidance and information

This initiative sits within a wider context of the ICE Carbon Project, the Infrastructure Carbon Review Seven Years On and CLC's Green Construction Board. On its own it is not sufficient to deliver a Net Zero UK, but it does enable individual organisations to publicise their annual progress, and thereby collaborate and share best practice on their journey to Net Zero with the intention of accelerating progress across the industry. Related initiatives that may provide additional guidance and structures to achieve the commitments of the Code include:

1. Infrastructure Carbon Review (2013) and the ICR Seven Years On Report
2. PAS2080 (available from BSI) and the accompanying guidance document
3. Construction Leadership Council's CO₂ Construct Zero initiative and its signposting
4. Engineers Declare and related initiatives: Architects Declare; Civil Engineers Declare; Structural Engineers Declare
5. CIH Procuring for Value framework and toolkit
6. The Netherlands Carbon Performance Ladder: used in the Netherlands to reward improved carbon performance through procurement
7. Construction Playbook 2020
8. HMG Green Book
9. ICE Carbon Project
10. CLC 9 Priorities to deliver net zero carbon the construction sector

Additional guidance and information will be available at www-smartininfrastructure.eng.cam.ac.uk on the Carbon Reduction Code page.

1a <https://www.gov.uk/government/publications/infrastructure-carbon-review>

1b https://www.constructionleadershipcouncil.co.uk/wp-content/uploads/2021/04/Infrastructure-Carbon-Review-seven-years-on_March-2021.pdf

2 http://www.constructionleadershipcouncil.co.uk/wp-content/uploads/2019/06/Guidance-Documents-for-PAS2080_vFinal.pdf

3a <https://www.constructionleadershipcouncil.co.uk/constructzero/>

3b <https://www.constructionleadershipcouncil.co.uk/constructzero/priorities/>

4 <https://www.engineersdeclare.com/> - <https://www.architectsdeclare.com/> - <https://www.civilengineersdeclare.com/> - <https://www.structuralengineersdeclare.com/>

5a https://constructioninnovationhub.org.uk/wp-content/uploads/2021/05/Value-Toolkit_Value-Definition-Framework_v2.0.pdf

5b <https://constructioninnovationhub.org.uk/value-toolkit/>

6 <http://www.co2performanceladder.com/>

7 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/941536/The_Construction_Playbook.pdf

8 <https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-government>

9 <https://www.ice.org.uk/knowledge-and-resources/carbon-project>

10 <https://www.constructionleadershipcouncil.co.uk/wp-content/uploads/2021/03/Construct-Zero-Summary-Documents.pdf>

Acknowledgements

With many thanks to the following for their input to the development of the *Carbon Reduction Code for the Built Environment*.

Karen Alford, Environment Agency

Lewis Barlow, Sweco

Andrew Barraclough, Wates Group

Keith Clarke, Active Building Centre and Constructionarium

Stacey Collins, Pinsent Masons LLP

Tim Embley, Costain and i3P

Mark Enzer, Mott MacDonald and Centre for Digital Built Britain

Dee Dee Frawley, Centre for Smart Infrastructure and Construction, University of Cambridge

Chris Fry, Accelar

Janet Greenwood, KPMG

Fergus Harradence, Department Business, Energy, and Industrial Strategy

Brittany Harris, Qualis Flow

Chris Hayes, Skanska UK

Charmaine Hughes, Manchester City Council

Dr Kat Ibbotson, Environment Agency

Dr Tercia Jansen Van Vuuren, LOR Centre, University of Cambridge

Dr Heleni Pantelidou, Arup

Dr Annette Pass, Highways England

David Pinder, Green Construction Board

Philip Sayer, Considerate Constructors Scheme

Dr Jennifer Schooling, Centre for Smart Infrastructure and Construction, University of Cambridge

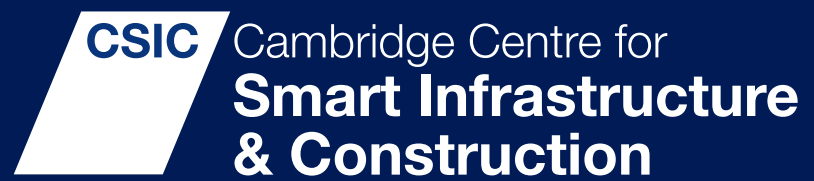
Anusha Shah, Arcadis

Sally Sudworth, Mott MacDonald

Hannah Vickers, ACE

James Wilcox, BE Sustainability

Peter Yates, Constructing West Midlands and National Association of Construction Frameworks



**Carbon Reduction Code for the Built
Environment - Issue 2021:2, October 2021**

Contact Details

**Centre for Smart Infrastructure and
Construction (CSIC)
University of Cambridge
Department of Engineering
Civil Engineering Building
JJ Thomson Avenue 7a
Cambridge CB3 0FA
www-smartinfrasturcture.eng.cam.ac.uk
[@CSIC-IKC](https://twitter.com/CSIC-IKC)
Enquiries: csic-admin@eng.cam.ac.uk**