

An industry-proposed amendment to The Building Regulations 2010

Whole life carbon

INDUSTRY-PROPOSED DOCUMENT



Z1 Carbon assessments

Z2 Carbon intensity

Disclaimer: This document is not part of the Building Regulations. It has been produced by and in conjunction with the construction industry as proof of concept in order to demonstrate one way in which embodied carbon could be introduced into UK regulation. For accompanying commentary on this document, visit www.part-z.uk, or contact hello@part-z.uk

Proposal revision 1
26 April 2022

A proposal from the construction industry

Proposed Document Z: Whole life carbon

Summary

0.1 This proposed document gives guidance on how to comply with the **whole life carbon requirements** of the Building Regulations.

NOTE: These requirements only apply to projects with a gross internal area of [1000]m², or that create more than [10no.] dwellings.

0.2 This proposed document contains the following sections:

Section 1 sets out the relevant legislation and provides an overview of the steps to **demonstrate compliance**.

Section 2 sets out the considerations that apply when **assessing the whole life carbon** (modules A1-A5, B1-B7, C1-C4, D) of the building.

Section 3 sets out the considerations that will apply when demonstrating that the building meets **limits for upfront embodied carbon** (modules A1-A5).

0.3 This document uses lifecycle module nomenclature (e.g. module A1, A2) in accordance with BS EN 15978

Transitional arrangements

0.4 Requirements Z1, carbon assessment, and Z2, carbon intensity, will be enforced from different dates:

- Requirement Z1 will apply to buildings other than dwellings from [1 January 2023]
- Requirement Z1 will apply to dwellings from [1 January 2025]
- Requirement Z2 will apply to all buildings from [1 January 2027]

0.5 Dwellings are deemed to be buildings where more than 80% of the gross internal area is Use Class C3 (Dwellinghouses) or C4 (Houses in multiple occupation).

Section 1: The requirements

- 1.1 This proposed document, deals with Requirement Z1, carbon assessment, and Requirement Z2, carbon intensity, of Schedule 1 of the Building Regulations 2010.
- 1.2 Relevant extracts from the Building Regulations 2010 are set out using text against a pink background in this proposed document. Where there is any doubt you should consult the full text of the regulations, available at <https://www.legislation.gov.uk/uksi/2010/2214/contents>.

Part Z of Schedule 1: Whole life carbon

<i>Requirement</i>	<i>Limits on application:</i>
Part Z Whole life carbon	
Carbon assessment	
Z1. Whole life carbon emissions shall be assessed and reported for the building and any other parts of the project where Building Regulations apply.	Requirements Z1 and Z2 only apply to projects with a gross internal area of more than [1000]m ² , or that create more than [10no.] dwellings.
Carbon intensity	
Z2. Reasonable provision shall be made for the minimisation of carbon emissions;	Requirement Z1 will apply to buildings other than dwellings from [1 January 2023], and dwellings from [1 January 2025]. Requirement Z2 will apply to all buildings from [1 January 2027].

Intention

Part Z1 is intended to normalise the use of whole life carbon assessments within the building design process, enabling design teams to identify ways in which to reduce the whole life carbon impact of the building. Assessment data will also be used to determine national targets for embodied carbon that will be used for Part Z2.

Part Z2 is intended to discourage excessive and unnecessary use of resources within the built environment, by setting a reasonable standard of efficiency for the upfront embodied carbon intensity of the building.

Demonstrating compliance

- 1.3** Compliance with the carbon assessment and carbon intensity requirements of the Building Regulations could be demonstrated by meeting the following criteria:
- 1.4** Criterion 1: A **Whole Life Carbon** assessment (modules A1-A5, B1-B7, C1-C4, D) must be undertaken. Use the guidance in Section 2 to demonstrate that this criterion has been met, submit the data to the government portal, and provide the assessment in report form to assist the Building Control Body to verify that compliance has been achieved.

NOTE: Criterion 1 is statutory guidance until the dates shown in 0.4 (transitional arrangements), at which point it will come into force as a regulation and will be mandatory.

- 1.5** Criterion 2: The **upfront embodied carbon** (modules A1-A5) of the overall building and its individual elements should not exceed reasonable standards of intensity in accordance with Section 3.

NOTE: Criterion 2 is statutory guidance until the date shown in 0.4 (transitional arrangements), at which point it will come into force as a regulation and will be mandatory.

Section 2: Whole life carbon assessments

2.1 This Section deals with the assessment of **Whole Life Carbon** emissions ('WLC').

Method

- 2.2 The **WLC** of the building is to be assessed in accordance with the RICS Professional Statement **Whole life carbon assessment for the built environment** for all modules except B6 (operational energy). Energy usage, regulated and unregulated, should be assessed in accordance with **Approved Document L** of the Building Regulations 2010, or an energy performance model, and then multiplied by the carbon factors present in the RICS Professional Statement for module B6.
- 2.3 The scope of the WLC assessment is outlined in **Scope** below.
- 2.3 The assessment should be reported to the Building Control Body ('BCB') in accordance with **Timing** and **Reporting** below.

Scope

- 2.4 The **WLC** assessment should include embodied and operational carbon: Modules A1-A5, B1-B7, C1-C4, D and sequestered carbon. The assessment should be reported using **Table 1**.
- 2.5 When reporting upfront embodied carbon, modules A1-A5 should be aggregated, excluding sequestered carbon. When reporting the total embodied carbon, and total whole life carbon, sequestered carbon should be aggregated with the other modules. Module D is to be reported separately throughout.

Timing

- 2.6 Before work starts, the builder must undertake a preliminary **WLC** assessment using the as-designed quantities and the generic embodied carbon factors given at <website URL>. The builder must give this design-based calculation to the **BCB**, along with a list of material quantities.
- 2.7 When work is complete, the builder must update this to form a final **WLC** assessment using final material quantities and relevant Environmental Product Declarations ('**EPD**') for upfront embodied carbon (modules A1-5) as far as possible. For building services, CIBSE TM65 may be followed if **EPD** are not available. The builder must give the final calculation to the **BCB**, along with final material quantities and carbon factors, and the **EPD** used in the calculation.

Reporting

- 2.8 The final **WLC** assessment should be reported via the government portal, available at <website URL>. This follows the same arrangement as is shown in **Table 1**.

Table 1 Reporting methodology for WLC assessments

PROJECT NAME	PRODUCT STAGE (tCO ₂ e)		CONSTRUCTION PROCESS STAGE (tCO ₂ e)		TOTAL EMBODIED CARBON (tCO ₂ e)		USE STAGE (tCO ₂ e)						END OF LIFE STAGE (tCO ₂ e)		TOTAL EMBODIED CARBON (tCO ₂ e)	TOTAL EMBODIED CARBON normalised (kgCO ₂ e/m ²)	TOTAL WHOLE LIFE CARBON (tCO ₂ e)	Benefits and impacts beyond the system boundary
	Biogenic carbon (tCO ₂ e)	Other carbon (tCO ₂ e)	[A1]	[A2]	[A3]	[A4]	[A5]	[B1]	[B2]	[B3]	[B4]	[B5]	[B6]	[B7]				
RICS Building Element Category																		
0.1	Demolition prior to construction																	
0.2	"Hot"/Hazardous/Contaminated Material treatment																	
0.3	Major Renovation Works																	
0.4	Facilitating works																	
0.5	Temporary support to Adjacent Structures																	
0.6	Temporary Diversion Works																	
0.7	Extraordinary Site Investigation																	
1	Substructure																	
2.1	Superstructure																	
2.2	Frames																	
2.3	Floors																	
2.4	Roof																	
2.5	Stairs and Ramps																	
2.6	Superstructure Windows and External Doors																	
2.7	Superstructure Internal Walls and Partitions																	
2.8	Internal Doors																	
3	Fittings																	
4	Fittings, furnishings & equipment																	
5	Building Related Items																	
6	Services (M&E)																	
7	Building Related Systems																	
8	Services (M&E)																	
9	Non-Building Related Systems																	
10	Prefabricated Buildings and Building Units																	
11	Work to Existing Building																	
12	External Works																	
TOTAL (tCO₂e)																		
TOTAL - normalised (kgCO₂e/m²)																		

*Module B6 to include required and unrequired energy use
Reporting Template based on RICS "Whole Life Carbon Assessment for the Built Environment" 1st Edition November 2017.

Section 3: Embodied carbon limits

- 3.1** This Section deals with the minimisation of upfront embodied carbon emissions (modules A1-A5). It works in conjunction with Approved Document L, Conservation of fuel and power, which minimises operational carbon emissions for energy (module B6) of the building.

Upfront embodied carbon

- 3.2** Before the work starts, the builder must use the preliminary **WLC** assessment (in accordance with clause 2.6) to demonstrate that the **upfront embodied carbon** (modules A1-A5) of the building are not greater than the **upfront embodied carbon limits** ('**UECL**') shown in **Table 2**. The builder must give this design-based assessment to the **BCB**.
- 3.3** When work is complete, the builder must use the final **WLC** assessment (in accordance with clause 2.7) to demonstrate that the **upfront embodied carbon** (modules A1-A5) of the completed building is not greater than the **UECL** shown in **Table 2**. The builder must give the final assessment to the **BCB**.

Table 2 Upfront embodied carbon limits for different typologies

This table will outline the upfront embodied carbon limits (UECL) for various building typologies, which the upfront embodied carbon (modules A1-A5) of the building must not exceed.

Prior to Part Z2 becoming mandated (i.e. prior to the dates shown in Section 0.4), guiding figures could be provided in an initial draft table, based on best available benchmarking guidance available at the time.

During the period in which Part Z1 is mandated, Table 2 will be updated based on data collected through the government portal (clause 2.8).

When Part Z2 is introduced, the limits in this table will be set at a level that allows the majority of building projects to pass easily, whilst preventing the worst offenders.

Table 2 will then be updated every [three years], with new lower limits set out each time.

As better data and guidance becomes available through the government portal, Table 2 could be extended to include limits on total embodied carbon or even whole life carbon (modules A1-A5, B1-B7, C1-C4).

Part Z of The Building Regulations (2010) Schedule 1

Requirement

Limits on application:

PART Z WHOLE LIFE CARBON

Carbon assessment

Z1. Whole life carbon emissions shall be assessed and reported for the building and any other parts of the project where Building Regulations apply.

Requirements Z1 and Z2 only apply to projects with a gross internal area of more than [1000]m², or that create more than [10no.] dwellings.

Carbon intensity

Z2. Reasonable provision shall be made for the minimisation of carbon emissions.

Requirement Z1 will apply to buildings other than dwellings from [1 January 2023], and dwellings from [1 January 2025].

Requirement Z2 will apply to all buildings from [1 January 2027].