



PART Z

A proposed amendment to the building regulations

March 2022

www.part-z.uk
hello@part-z.uk
[#RegulateEmbodiedCarbon](https://twitter.com/RegulateEmbodiedCarbon)



PART Z

Selected statements in support of the regulation of embodied carbon

BAM Construct UK Ltd

“BAM are fully supportive of the proposal to regulate the measurement and limiting of embodied carbon via an addition to the building regulations. We are already measuring embodied carbon and working with public and private sector clients to better understand embodied impacts and how to tackle them.”

Jesse Putzel, Head of Sustainability (2021)

Multiplex Europe

“Tackling embodied carbon is undoubtedly one of the most important challenges for everyone working in the construction sector [...] reducing embodied carbon currently requires a series of voluntary decisions and actions across the value chain. Regulating embodied carbon through legislation will help shift the problem-solving from optional to mandatory, which our sector urgently needs. That’s why Multiplex Europe fully supports the incorporation of embodied carbon reduction into building regulations”

Andy Butler, Technical Director

Morgan Sindall Group

“Morgan Sindall are broadly supportive of the principles of Building Regulations Part Z to measure and limit embodied carbon. Tackling embodied carbon across the life of an asset is an important part of our commitment to be a responsible business, and we use our whole life carbon assessment tool CarboniCa to enable our customers’ low carbon aspirations. Part Z provides an opportunity to articulate a consistent approach to carbon assessment methodology, scope definition and target-setting across the sector, and should lead to year-on-year reductions in embodied carbon by encouraging greater innovation and transparency of product emissions in the supply chain.”

Graham Edgell, Director of Sustainability & Procurement

Willmott Dixon

“Willmott Dixon supports the need for regulation requiring the assessment and reduction of embodied carbon. [...] We [...] are already working with customers to assess and reduce embodied carbon.”

Michael Cross, Head of Partnerships & Innovation

Laing O’Rourke

“At Laing O’Rourke [...] we welcome Part Z – mandating the assessment and limiting of embodied carbon in buildings via the planning process would increase the entire sector’s focus on ways to accelerate and make the progress required.”

Vicky Bullivant, Group Head of Sustainability

Off Site Homes Alliance (OSHA)

“The Off Site Homes Alliance is a large client group of registered providers, fully supported by a considerable group of industry stakeholders and key influencers, all driving the use of MMC/Offsite processes [...] We [...] fully support the proposal for UK Building Regulations to require the assessment and limitation of embodied carbon in construction, as a necessary driver of behaviour and process”

Mike Ormesher, Project Director

The London Energy Transformation Initiative (LETI)

“LETI very much supports the principle of regulating construction embodied carbon as a key component of our route to zero carbon, in its place alongside operation energy. Low embodied carbon is an imperative that has few market drivers and requires that clear regulatory level playing field to progress. The key elements of measurement, reducing, verifying and sharing, allow industry to respond positively and rapidly to play its part.”

Chris Twinn

These statements are in support of the principle of embodied carbon regulation, and not necessarily the contents of the proposed draft Approved Document Z, which is presented in this document as a proof of concept. Some statements have been shortened; the full statements are at www.part-z.uk/support.

Lendlease

“At the moment government only regulates operational energy used to heat, light and cool buildings. But we also know that if we look ahead to 2050, approximately 50 per cent of the carbon emissions associated with new buildings will come from the so-called embodied carbon, the carbon that goes into making the steel, the concrete and other materials that then go into our buildings, which at the moment isn't regulated at all. Steel and concrete each account for 7 to 8 per cent of global greenhouse gas emissions, so unless we start to regulate the use of these materials in terms of the embodied carbon impact we are missing the proverbial elephant in the room.”

Paul King, Managing Director Sustainability & Social Impact - Europe

Grosvenor Great Britain & Ireland

“For too long embodied emissions in construction have been hidden in the built environment. With today's call the industry is asking for regulation to ensure that every significant UK development tracks and limits its full carbon footprint. We already do this for our large development projects and the time is right to introduce legislation for the whole industry.”

Tor Burrows, Executive Director, Sustainability and Innovation

British Land

“British Land has committed to making our whole portfolio net zero carbon by 2030, setting stretching targets for embodied and operational carbon performance. We support this call for a change to building regulations to limit embodied carbon emissions and embed whole life carbon reporting across our sector.”

Matthew Webster, Head of Environmental Sustainability

Thakeham Group

“As an SME housebuilder, we acknowledge the impact of the decisions we make and the impact of that on our Scope 3 emissions, and as such we fully support the call for embodied carbon to be regulated in the UK.”

Josie C-Thornewill, Sustainability Director

Urban Splash

“[T]he elephant in the room is embodied carbon and this needs addressing urgently. A recent study of our own Scope 1, 2 and 3 emissions shows that our Scope 3 embodied carbon emissions are by far the largest, accounting for 94% of whole life cycle emissions. [...] Reducing embodied carbon emissions is now the biggest challenge for the construction industry if it is to move to a more sustainable footing.”

Jonathan Falkingham, Co-founder & Creative Director

abrdn investments

“abrdn Investments are supportive of the regulation of embodied carbon. We have already made commitments that include reducing the embodied carbon in our real estate funds, and we believe that the requirements to report whole life carbon, and set informed limits on embodied carbon, would help the real estate sector to decarbonise.”

Dan Grandage, Head of ESG, Private Markets

Royal London Asset Management

“Royal London Asset Management endorses the concept of regulation that mandates the reporting of – and sets limits on – embodied carbon emissions in the built environment. Such regulations are aligned with RLAM's Property net zero carbon development ambitions, and should encourage further decarbonisation in our industry by helping to ensure everyone plays by the same 'sustainability' rules.”

Tim Coffin, Responsible Property Investment Manager

Igloo

“Igloo supports the principles behind Part Z and is working to deliver them through initiatives like our Home of 2030 winning design, igloo footprint and Planet Positive Homes. Regulating Upfront carbon, in new construction and retrofit, is a critical missing element in Building Regulations and planning policy.”

Chris Brown, Executive Chair

Landsec

“Nearly 50% of whole life carbon emissions of a building occur before it is even occupied. Yet these emissions are entirely unregulated and the focus of building regulations for new buildings remains on the expected energy and carbon emitted from running the building. Landsec has been undertaking embodied carbon assessments and driving reductions on its development activities since 2013 and fully supports these assessments becoming a legal requirement as part of Building Regulations.”

Jennie Colville, Head of Sustainability

Stanhope PLC

“Stanhope fully supports the principle of regulating upfront embodied carbon in construction. The impact of these emissions arising from global supply chains cannot be overstated in the critical decade of climate action ahead, and they are currently not given the same level of attention as operational energy which is embedded in current building regulations. We look forward to engaging with the government and our industry peers to develop appropriate benchmarking, regulations and guidance contributing to the UK decarbonisation process.”

Adam Smith, Sustainable Design Leader



PART Z

Selected statements in support of the regulation of embodied carbon

The Royal Town Planning Institute (RTPI)

“The RTPI has been calling for use of our existing built up areas - including town and city centres - in preference to green fields where possible and we are now coming to appreciate the value of reusing rather than demolishing buildings. We join this call for more measurement of embodied carbon and its use in regulation and policy.”

Victoria Hills, Chief Executive

The Chartered Institution of Building Services Engineers (CIBSE)

“CIBSE promote the efficient use of resources and effective, comprehensive, action on climate change. This must include both operational and embodied carbon, and there is therefore a need to regulate embodied carbon. Industry leadership in the past few years has allowed the development of methods and expertise among market leaders, which now makes it possible for regulation to happen and reach the whole sector.”

The Steel Construction Institute (SCI)

“SCI [...] supports the principle of regulating embodied carbon to contribute to meeting national net-zero targets and is happy to be involved in their development, provided they are industry-led.”

Dr Michael Sansom, Associate Director, Sustainability

These statements are in support of the principle of embodied carbon regulation, and not necessarily the contents of the proposed draft Approved Document Z, which is presented in this document as a proof of concept. Some statements have been shortened; the full statements are at www.part-z.uk/ support.

The Institution of Civil Engineers (ICE)

“The ICE wholeheartedly supports the regulation of carbon assessment and embodied carbon, as this is a necessary, achievable and urgent aspect of the transition to net zero. The Carbon Project, founded and led by the ICE, recommended an addition to building regulations that concern embodied carbon in buildings, as well as an exploration into options for the setting of carbon benchmarks and targets.”

Rachel Skinner, President (2021)

The Institution of Structural Engineers (IStructE)

“Because Structural Engineers are an intrinsic element in the professional design and construction team, efficient and effective deployment of materials in structural design is at the heart of reducing embodied carbon and as such, The Institution of Structural Engineers welcomes this initiative to focus attention on appropriate Building regulation via the imaginative development of ‘Part Z.’”

Don McQuillan, President (2020-2021)

Chartered Institute Of Building (CIOB)

“CIOB is supportive of regulatory moves which enable a focus on embodied carbon [...] The industry needs to walk the walk on minimising climate change, not just talk the talk, and we expect CIOB members to update their knowledge through CPD and understand how they can make a meaningful positive contribution to achieving net zero.”

Caroline Gumble, Chief Executive Officer

The Royal Institute of British Architects (RIBA)

“Embodied carbon accounts for a large proportion of emissions produced by the built environment. As such the Government must urgently address it as part of its strategy to reach net-zero. We will continue to call on the Government to introduce regulations that stipulate consistent assessment and reporting of whole life carbon, including setting specific targets for embodied carbon.”

Alan Jones, President (2021)

UK Green Building Council (UKGBC)

“UKGBC has been advocating for regulation of embodied carbon for many years and welcomes the growing industry focus on this vital aspect of carbon reduction within the built environment. [The Net-Zero Whole Life Carbon Roadmap for the Built Environment highlights] the need for regulation of upfront embodied carbon, alongside a range of supporting policy proposals and enabling actions.”

Alastair Mant, Director of Business Transformation

Construction Industry Council (CIC)

“Through our Climate Change Action Plan for professional institutions, we have highlighted the need for reporting on embodied carbon. We welcome the excellent work that is being done through the Part Z initiative to drive forward the principle of embodied carbon regulation.”

CIC Climate Change Committee

WSP

“Operational carbon reductions in the last 20 years were generated by tightening up the appropriate building regulations in 2002 which galvanised clients, design teams and the supply chain. A similar transformation is extremely important and urgently required within the embodied carbon sphere, through a whole life carbon regulation in direct response to the climate emergency.”

Kamran Moazami, Managing Director UK Property & Buildings

Arcadis

“The lack of regulation for embodied carbon emissions is one of the biggest gaps in a coherent strategy to decarbonise the built environment and construction. [...] The Part Z proposal provides government with an “oven-ready” solution to introduce regulation to address whole-life carbon in the built environment and limit embodied emissions. Arcadis supports the Part Z proposal and encourages the UK Government to introduce this step change as soon as possible.”

Ben Harris, UK Climate Change & Sustainability Director

Skidmore, Owings & Merrill (SOM)

“It is our firm view that significant, wide-spread change is only possible if there is a strong legislative framework which mandates carbon reductions across the sector”

Dimitri Jajich, Structural Engineering Director

Atkins Limited

“Atkins support the principle of regulating embodied carbon in the construction industry. [...] Part Z could be a key enabler for our industry to meet the UK Government’s Net-Zero Carbon commitment by 2050.”

Gary Frame, Regional Director

BDP

“We welcome the efforts made to regulate performance and to standardise the approach to evaluating embodied carbon impacts in the built environment. [...] Setting this baseline will also serve to furnish the industry with greater intelligence, which is necessary to incentivise progress and drive speed of change!”

Philip Gray, Head of Sustainability

Ramboll

“Ramboll fully supports the proposal to regulate embodied carbon and provide a consistent approach to embodied carbon assessments. [...] Addressing these sources of carbon will be critical in meeting the UK’s 2050 target. A clear legislative framework is required and Part Z is an essential step.”

Philippa Spence, Managing Director

Allford Hall Monaghan Morris

“AHMM supports the principle of regulating building related embodied carbon. [...] A new Approved Document will help set the trajectory in embodied carbon emissions reductions required to address the climate emergency.”

Craig Robertson, Head of Sustainability

Arup

“Around 10% of our national GHG emissions are associated with construction (embodied carbon). To reduce embodied carbon impacts in line with the national net-zero 2050 pathway, we need firm, supportive legislation which sets out a clear requirement to measure, report, and reduce against aligned targets.”

Chris Carroll, Net-Zero Buildings Leader, UKIMEA Region

Mott Macdonald

“Mott MacDonald fully supports the regulation of embodied carbon, ensuring all steps in the whole life-cycle are taken into consideration; from design and construction, operation and maintenance right through to de-construction.”

Sally Sudworth, Global Head Sustainability & Climate Change

Allies & Morrison

“The embodied carbon in construction activity is one of the most direct ways in which our industry influences climate change - yet these impacts remain unregulated and unrestrained. Allies and Morrison wholly support this initiative which ensures that embodied carbon reduction is no longer an aspiration but an obligation for all.”

James Woodall, Head of Sustainability

Buro Happold

“A change in building regulations is essential to recognise the importance of measuring and reducing the embodied carbon in building design. We support wholeheartedly the proposals for UK Building Regulations to mandate the assessment and limitation of embodied carbon in construction..”

Dr Sarah Prichard, Partner & UK Managing Director

Perkins&Will

“The proposed Part Z of the Building Regulations fills a critical gap by mandating the assessment and limitation of carbon emissions embodied in the construction of buildings. [...] These proposals are a necessary step to achieve UK’s sixth carbon budget set by the Climate Change Committee.”

Asif Din, Sustainability Director

Hawkins\Brown

“Hawkins\Brown are advocates of a phased approach to Embodied Carbon regulation. While the industry has spent decades reducing operational carbon and eliminating the use of fossil fuels, we are still a long way from reporting embodied carbon on every project. The only way of doing this at the speed and scale which is required is to legislate measurement, ensure consistency, set benchmarks and eventually mandate limits.”

Louisa Bowles, Partner & Sustainability Lead

Feilden Clegg Bradley Studios

“Embodied carbon regulation is essential if we are to create a level playing field to enable the construction industry to make its contribution to meeting our governments climate change targets over the crucial next decade. Regulation will help the industry focus on a new generation of low carbon materials”

Peter Clegg, Senior Partner



Part Z in the construction industry press

“Conditions are right for seismic change. It’s time to ask really tough questions.”

“The proposed introduction to the Building Regulations of Part Z – Whole Life Carbon is an urgent legislative mechanism that is to be applauded and cannot come quickly enough. Carbon calculation is now a routine part of our lexicon and daily activity.”

Building.co.uk,
3 November 2021

“To drive down carbon emissions on every project, we need to change the Building Regs”

“To drive down carbon emissions on every project, we need to change the Building Regs.

Part Z, a proposed amendment to the Building Regs drafted by industry sustainability experts, already has impressive support – but you and your practice can help us build on that.”

Architects Journal,
6 September 2021

“Another big global trend on the way: capped embodied carbon”

“In an action that could have wide global implications a team of experts in the UK has proposed that the upfront and embodied carbon of building materials be compulsorily calculated and capped as a requirement of Building Regulations. US states California, Minnesota and Oregon also have state-level carbon requirements; and the federal government looks like heading the same way..”

The Fifth Estate,
27 July 2021

“Heavyweights back proposals to set legal limits on embodied carbon”

“The proposals would see an amendment made to the Building Regulations setting mandatory limits for upfront carbon emissions on all building projects over 1,000sq m from 2027.”

Building Design,
21 July 2021

“‘Part Z’ embodied carbon cap tabled by industry group”

“Industry calls on government to mandate assessment and reporting of whole life carbon on building projects over 1000m2 through Building Regulations by 2027”

The RIBA Journal,
23 July 2021

Arup pledges to carry out whole life-cycle carbon assessments on all of its building projects across the world

“[Arup] said the insights it will gain from conducting “thousands” of the studies each year will help the construction industry advance towards net zero emissions.”

Building.co.uk,
9 November 2021

“We need a Part Z to regulate embodied carbon”

“It’s time to tackle carbon emissions from construction, which have failed to fall alongside operational carbon.”

Building.co.uk,
23 July 2021

“Construction industry supports proposed amendment to UK Building Regulations 2010”

“The proposed Building Regulations amendment ‘Part Z’ and Approved Document Z has been released, outlining requirements on the assessment of whole life carbon emissions, and limiting of embodied carbon emissions, for all major building projects in the UK.”

Institute of Materials, Minerals & Mining,
3 August 2021

Part Z briefing note: the case for regulating carbon in construction

Embodied carbon emissions in construction are not regulated, even though they can constitute the bulk of emissions for new buildings. **The construction industry is ready for such regulation.** A draft regulation and approved document is given at www.part-z.uk/proposal.

Embodied carbon in construction

Buildings and construction form a substantial portion of UK carbon emissions. They contribute both **operational carbon** emissions (due to energy and water use) and **embodied carbon** emissions (due to the use of construction materials). The sum of these operational and embodied carbon emissions is referred to as the **whole life carbon** emissions of the building.

For a long time, **operational carbon** has accounted for the bulk of most buildings' emissions. However operational carbon has reduced in recent years due to the decarbonisation of the grid, a trend set to continue with further decarbonisation alongside transitioning to electric heating.

As such, the **embodied carbon** emissions in construction contribute an increasing proportion of the whole life carbon emissions for most buildings, with studies indicating that over two-

thirds of a low energy new building's emissions are embodied.

Operational carbon emissions are directly linked to operational energy use, which are limited by Part L of the Building Regulations. **There is no such parallel legislation limiting embodied carbon emissions.**

Industry readiness

Across the construction industry, firms are already calculating and reporting the whole life carbon emissions of their projects. This is typically done either voluntarily, or in response to client requirements. The Greater London Authority now requires a whole life carbon assessment as part of planning for projects over a certain size.

The industry feedback is that regulation would be positively received, and a collection of supporting statements are shared at www.part-z.uk/industry-support. Designers and contractors have commenced a period of rapid up-skilling in recent years and are more able than ever before to design and construct buildings within emissions limits. Major developers see benefit in requiring the whole industry to report and limit emissions to avoid disadvantaging those who choose to do so voluntarily. And investors keen to strengthen their ESG credentials welcome actions that increase the amount of low-carbon construction happening in the UK.

The UK Green Building Council's Net Zero Whole Life Carbon Roadmap, endorsed by industry giants such as Lloyd's Banking Group, Berkeley Group plc, and AECOM, calls for the mandatory measurement of whole life carbon, followed by the phased introduction of embodied carbon limits. The UK's COP26 IDD1 pledge commits it to disclosure of embodied carbon emissions of materials used in all major public construction projects by 2025. Part Z is a ready-made proposed amendment to the Building Regulations that will deliver these requirements.

Part Z and Approved Document Z

Part Z is a proposed amendment to the Building Regulations, written by construction industry sustainability experts and shared, along with a proposed Approved Document Z, at www.part-z.uk.

The document is just seven pages long, as it utilises industry-accepted existing guidance documents, notably the Royal Institute of Chartered Surveyors (RICS) Professional Statement "Whole Life Carbon Assessment for the Built Environment", and is aligned with guidance published by the Royal Institute of British Architects (RIBA), the Institution of Structural Engineers (IStructE), and the Chartered Institution of Building Services Engineers (CIBSE).

Part Z is written with proposed dates that are deemed to be achievable whilst remaining ambitious, requiring the whole life carbon assessment and reporting of all projects of more than 1000m² (or 10 dwellings) from 2023 for non-domestic buildings, and 2025 for domestic; and the introduction of legal carbon limits on embodied carbon emissions from 2027, giving a period of time during which robust limits can be set. This proposed timescale follows the precedent set by other European countries such as the Netherlands and France that have already started progressing this topic. As with all contents of the proposed Part Z and Approved Document Z, these dates are subject to review and agreement by Government.

The construction industry is ready for embodied carbon regulation, with Part Z providing the template that the final Building Regulation could be built around. The Part Z authors are keen to talk further with government and policy makers and provide input into the required next steps.

Part Z

Industry's proposal

Background

Due to the significant contribution that the embodied carbon of buildings makes to the climate emergency, there is a need to introduce legislation towards mandatory reporting of carbon emissions in the built environment, along with limiting embodied carbon emissions on projects.

Industry's proposal for Part Z and its accompanying proposed Approved Document Z is written as a proof of concept of the regulation that's needed in the UK. If enacted, Part Z would ensure that embodied carbon is assessed on all projects, as part of a comprehensive whole life carbon assessment.

It would also ensure that the embodied carbon emissions are then capped on all major construction projects - initially through limits on upfront

embodied carbon, but over time expanding to cover all aspects of embodied carbon.

Approved Document Z is aligned with the Royal Institution of Chartered Surveyors (RICS) Professional Statement 'Whole life carbon assessment for the built environment', and guidance and recommendations made by the Royal Institute of British Architects (RIBA), the Institution of Structural Engineers (IStructE), the Chartered Institution of Building Services Engineers (CIBSE), the UK Green Building Council (UKGBC) and the London Energy Transformation Initiative (LETI).

Part Z shown as a proposed amendment to Building Regulations (2010) Schedule 1

The text shown on the facing page matches that shown with a green background in Section 1 of industry's proposal for an Approved Document Z.

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].

NON-GOVERNMENTAL INDUSTRY PROPOSAL
NOT AN APPROVED DOCUMENT

Introduction to Industry's proposal for an Approved Document Z

This proposed Building Regulations amendment 'Part Z' and Approved Document Z outlines requirements on the assessment of whole life carbon emissions, and limiting of embodied carbon emissions, for all major building projects.

The proposal introduces mandatory assessments ahead of setting carbon limits, giving time to converge on robust yet ambitious targets.

Approved Document Z is aligned with the Royal Institution of Chartered Surveyors (RICS) Professional Statement 'Whole life carbon assessment for the built environment', and guidance and recommendations made by the Royal Institute of British Architects (RIBA), the Institution of Structural Engineers (IStructE), the Chartered Institution of Building Services Engineers (CIBSE), the UK Green Building Council (UKGBC) and the London Energy Transformation Initiative (LETI).

If adopted, it would rapidly accelerate the voluntary action occurring across our industry, leading to green investment and green jobs creation across construction.

The need to introduce carbon regulation is supported by industry leaders, called for by the Climate Change Committee, and included as a key recommendation in the UK Green Business Council's (UKGBC) Net Zero Whole Life Carbon Roadmap. In this light, Part Z will hopefully be seen as an 'easy win' for the UK's roadmap to Net Zero.

A proposed amendment to The Building Regulations 2010

Whole life carbon



APPROVED DOCUMENT

Z1 Carbon assessments

Z2 Carbon intensity

Disclaimer: This document is not yet part of the Building Regulations. It has been produced by and in conjunction with the construction industry as a 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 0
20 July 2021

Reader notes to Page 1

This page summarises the format that the rest of the document follows. It also highlights key limits on application (size, and transition dates).

It reiterates what is said in the proposed Part Z regarding a minimum project size for which the document shall take effect. The 1000m² limit shown here is a placeholder and is aligned with the proposed size limit in the Future Homes Standard.

It also shows staggered introduction dates between requirements Z1 and Z2, following the precedent set by other countries, and gives a period of time during which robust carbon limits can be determined. The proposed dates are shown as placeholders but follow the timescales followed by other countries.

Use classes are in accordance with those used on the Planning Portal. [Square brackets] indicate key limits and dates. The proposed values must balance ambition with deliverability and should be determined through further consultation.

Approved Document Z: Whole life carbon

Summary

- 0.1** This approved 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 approved 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).

Reader notes to Page 2

The text given in the green box on this page is a repeat of the proposed 'Part Z' to be inserted into Schedule 1 of the Building Regulations (2010).

It reiterates what is stated on Page 1 around size limits and transitional dates.

The page highlights the intention of Parts Z1 and Z2, namely that:

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

Part Z2 is intended to discourage excessive and unnecessary use of material within the built environment by requiring a reasonable standard of efficiency of upfront embodied carbon.

Section 1: The requirements

- 1.1** This approved 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 green background in this approved 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.

Reader notes to Page 3

This page introduces the steps that must be taken in order to comply with Parts Z1 and Z2 of the building regulations. Note that the staggered introduction dates shown on Page 1 mean that some criteria will be statutory guidance rather than mandatory regulation when first introduced.

It is proposed that initially, Criterion 2 only limits upfront embodied carbon (modules A1-A5), enabling Building Control Officers to sign off compliance with Part Z by reviewing the final material quantities and environmental product declarations used in the building.

It is anticipated that this A1-A5 limit, in conjunction with the energy limits enforced by Part L, will enable the built environment to start to reduce the impact of its emissions – however the longer term ambition must be to extend the limits to include all whole life carbon modules that are reported (modules A-C, and module D). Data gathered as part of Criterion 1 would help this.

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.

NON-GOVERNMENTAL INDUSTRY PROPOSAL
NOT AN APPROVED DOCUMENT

Reader notes to Page 4

The assessment of whole life carbon emissions is proposed to be undertaken with the RICS Professional Statement ‘Whole life carbon assessment for the built environment’, which is already the de facto guidance document on this topic in the UK.

This can be undertaken by any tool - paid, or free to use - provided that it is aligned with the RICS Professional Statement.

For non-domestic buildings where Approved Document L requires an energy forecast in addition to the compliance model, (as defined by draft ADL-2 §5.18 and §9.4) then the energy forecast would be more suitable for this use.

Regarding the use of the word “builder” (e.g. clause 2.6), this is simply used for consistency with Approved Document L1A and others, and a wider design team involvement is expected.

Regarding the use of generic embodied carbon factors prior to starting construction (clause 2.6), this is in alignment with RICS, RIBA, CIBSE and IStructE methodologies.

Finally, note that a cross-industry team is currently developing a free-to-use Built Environment Carbon Database (BECED) that will be launched this year and should be used as part of this process to minimise cost and complexity to all.

The BECD will include a Product Database that will be reviewed regularly, and is therefore proposed to be referenced for the generic carbon factors required for clause 2.6. It will also include a Buildings Database that is proposed for use as the ‘government portal’ in clause 2.8.

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*.

Reader notes to Page 5

Table 1 as shown, which outlines the format in which whole life carbon should be reported, is closely based on the RICS Professional Statement, and will be aligned with the Built Environment Carbon Database (BECD).

Table 1 Reporting methodology for WLC assessments

PROJECT NAME	USE CLASS (e.g. C1, C2)	GIA, m ²	PRODUCT STAGE (tCO ₂ e)				CONSTRUCTION PROCESS STAGE (tCO ₂ e)				TOTAL USE STAGE 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 loads beyond the system boundary		
			[A1]	[A2]	[A3]	[A4]	[A3]	[A4]	[A5]	[B1]		[B2]	[B3]	[B4]	[B5]						[B6]*	[B7]
RICS Building Element Category																						
01	Demolition prior to construction																					
02	Toxic/Hazardous/Contaminated Material Treatment																					
03	Major Demolition Works																					
04	Facilitating works																					
05	Site preparation, Adjacent Structures																					
06	Specialist Civil Works																					
	Temporary Diversion Works																					
	Extraordinary Site Investigation																					
1	Substructure																					
21	Superstructure																					
22	Frame																					
23	Upper Floors																					
24	Roof																					
	Stairs and Ramps																					
25	Superstructure																					
26	Internal Walls and Partitions																					
	Windows and External Doors																					
27	Superstructure																					
28	Internal Walls and Partitions																					
	Internal Doors																					
3	Finishes																					
4	Fittings, furnishings & equipment																					
	Building Related Items																					
5	Services (MEP)																					
	Building Related Systems																					
	Services (MEP)																					
	Non-Building Related Systems																					
6	Prefabricated Buildings and Building Units																					
7	Work to Existing Building																					
8	External works																					
TOTAL (tCO ₂ e)																						
TOTAL - normalised (kgCO ₂ e/m ²)																						

*Module B6 to include regulated and unregulated energy use
Reporting Template based on RICS 'Whole Life Carbon assessment for the built environment' 1st Edition November 2017.

Reader notes to Page 6

The final section of Approved Document Z sets out the limits that would need to be achieved in future carbon assessments.

To start with, it is proposed that only upfront embodied carbon (modules A1-A5) is limited by regulation, enabling Building Control Officers to sign off compliance with Part Z by reviewing the final material quantities and environmental product declarations used in the building.

It is anticipated that this A1-A5 limit, in conjunction with the energy limits enforced by Part L, will enable the built environment to start to reduce the impact of its emissions – however the longer term ambition must be to extend the limits to include all life-cycle modules that are reported (modules A-C, and module D). Data gathered through the government portal / Built Environment Carbon Database (www.becd.co.uk) would help to enable this.

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.

NON-GOVERNMENTAL INDUSTRY PROPOSAL
NOT AN APPROVED DOCUMENT

Reader notes to Page 7

Table 2 is shown as a placeholder for the carbon intensity limits that would be outlined in Approved Document Z.

Prior to Part Z2 being mandated, guiding figures could be taken using the benchmarks provided in the Greater London Authority's whole life-cycle carbon assessments guidance, currently available in draft form at www.london.gov.uk/what-we-do/planning/implementing-london-plan/london-plan-guidance/whole-life-cycle-carbon-assessments-guidance. This would also align with targets work undertaken by RIBA, LETI, and the IStructE.

This highlights the benefit of utilising the free Built Environment Carbon Database (BECD) in order to capture construction data, allowing limits to be set at an appropriate level.

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

Some Frequently Asked Questions

(for a full list, see www.part-z.uk/faq)

Basic questions

What is embodied carbon?

Embodied Carbon emissions are the greenhouse gas emissions and removals associated with materials and construction processes throughout the whole life cycle of an asset (Life Cycle Modules A1-A5, B1-B5, C1-C4).

The Life Cycle Modules are defined in the RICS professional statement: Whole life carbon assessment for the built environment.

What is upfront carbon?

Upfront Carbon emissions are the greenhouse gas emissions associated with materials and construction processes up to practical completion, the point at which the building works are concluded and signed off by Building Control (Life Cycle Modules A1-A5). Upfront carbon excludes the biogenic carbon sequestered in the installed products at practical completion.

What is the construction industry's opinion regarding its readiness for embodied carbon regulation?

The consensus is that the UK construction industry supports – and is ready for – embodied carbon regulation. The statements of support shown at the start of this document demonstrate this support and readiness.

Questions about the need for embodied carbon regulation

Why are emissions limits on materials not proposed instead?

It is the overall emissions of construction that needs to be regulated, not just that of the original materials used.

Suppose only emissions in the production of the materials were restricted. Then the potential inefficient use of these materials (whether low-carbon or not) in buildings would remain unchecked, i.e. a building's embodied carbon emissions remains unregulated.

A useful analogue is that for a building's energy use: even though energy production is taxed, Part L is used to cap operational energy usage.

Why is a carbon tax to disincentivise excessive embodied carbon emissions not proposed instead?

The UK may or may not be ready for a carbon tax, but the consensus is that the UK construction industry is ready for embodied carbon regulation.

In order to implement a carbon tax, a reliable and regulated method of calculating and reporting carbon is needed. Part Z sets the groundwork for this in the UK construction sector.

Wouldn't this sit better in planning regulations rather than building regulations?

Planning stage is often too early to carry out a detailed whole life carbon assessment, as often the information on the detailed design and quantities is insufficient at this point.

Designers may still choose to undertake a high-level carbon appraisal early in design to maximise chances of compliance with Part Z.

Questions about the contents of the proposed Part Z

What is the contents of the proposed Part Z based on?

The proposal is derived from the principles underlying other existing building regulations, industry best practice, and a series of consultations with carbon experts and industry leader supporters.

Why are whole life carbon (WLC) targets not proposed?

Part Z is about regulating the reporting of WLC, and limiting up-front embodied carbon. This scope balances ambition with industry achievability.

The targets are on upfront embodied carbon only, as this is easiest to measure and sign off by Building Control, and has the most consistency in current industry data and assumptions.

Could Part Z be expanded to include whole life carbon (WLC) targets?

Part Z is written in a way that could allow WLC targets in the future if desired.

What was the motivation behind the proposed dates for implementation?

The dates shown are the right balance of achievability and ambition. They follow global precedent, allow time for the entire industry to gear up towards reporting whole life carbon on every project, and allow time to use the collected data to set robust and appropriate targets.

What is the relationship between Part L and Part Z?

Part L and Part Z work together. The output from Part L feeds into Module B6 in the whole life carbon assessment in Part Z.

Who would "sign off" on Part Z compliance?

As this proposal sits under Building Regulations, the assumption is that compliance would be signed off by Building Control Officers.

As it is only upfront embodied carbon (modules A1-A5) that would be limited by the proposal, sign-off could be achieved following reviewing the final material quantities and Environmental Product Declarations used in the construction.



The Part Z initiative is
generously supported by:

The Institution of
StructuralEngineers

FeildenCleggBradleyStudios



The carbon cost of this pamphlet has been calculated for
three different projected scenarios:

Retain and Pass on:	47gCO ₂ e
Dispose of by landfill:	75gCO ₂ e
Recycle:	26gCO ₂ e