CITY PLAN 2019 - 2040

Retrofit First Topic Paper

Submission Version

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FAIRER WESTMINSTER

City of Westminster

Contents

Glossary

- **BBP** – Better Buildings Partnership
- **BRE** – Building Research Establishment
- **BREEAM** – Building Research Establishment Environmental Assessment Method
- **CAZ** – Central Activities Zone
- **CIBSE** – Chartered Institution of Building Services Engineers
- **CO_2** – Carbon dioxide
- **CO_2e** – Carbon dioxide equivalent
- **CPPR** – City Plan Partial Review
- **ECHR** – European Convention on Human Rights
- **ECtHR** – European Court of Human Rights
- **EIA** – Environmental Impact Assessment
- **ESPD** – Environmental Supplementary Planning Document
- **GHG** – Greenhouse Gas
- **GLA** – Greater London Authority
- **HM** – His Majesty's
- **IPCC** – Intergovernmental Panel on Climate Change
- **IStructE** – The Institution of Structural Engineers
- **KG** – Kilograms
- **KT** – Kilo tonnes
- **LEGGI** – London Energy and Greenhouse Gas Inventory
- **LETI** – Low Energy Transformation Initiative
- **LPG** – London Plan Guidance
- **MHCLG** – Ministry of Housing, Communities and Local Government
- **NPPF** – National Planning Policy Framework
- **NRMM** – Non-Road Mobile Machinery
- **PACER** – Planning Application Carbon Evaluation Reduction tool
- **POAH SPD** – Planning Obligations and Affordable Housing Supplementary Planning Document
- **RIBA** – Royal Institute of British Architects
- **RICS** – Royal Institution of Chartered Surveyors
- **SEA** – Strategic Environmental Assessment
- **Sqm** – Metres squared (m^2)
- **T** – Tonnes
- **UKGBC** – UK Green Building Council
- **UKNZCBS** – UK Net Zero Carbon Building Standard
- **WCC** – Westminster City Council
- **WLCA** – Whole Life Carbon Assessment
- **WPA** – Westminster Property Association

1. Introduction

1.1 Background

The purpose of this Topic Paper

1.1.1 Westminster City Council is undertaking a Partial Review of the City Plan 2019-2040. This is to strengthen the existing policy on the delivery of affordable housing, to prioritise retrofit and refurbishment of existing buildings and to introduce a number of site allocations.

1.1.2 The purpose of this Topic Paper is to provide background and summarise the evidence base for the draft policy to promote retrofitting over demolition and subsequent reduction in upfront embodied carbon emissions, known as the Retrofit First policy. This Topic Paper will bring together different sources of information including data, policy analysis and consultation responses to set out the rationale for the policy and its different elements.

Updates following the Regulation 19 consultation

1.1.3 A Retrofit First Topic Paper was originally published as supporting evidence to the council's Regulation 19 consultation version of the City Plan Partial Review in March 2024. Following this consultation period, a review was undertaken by the council to understand ways in which the policy could be modified to improve its implementation and effectiveness. As such, the evidence supporting the policy was also reviewed. This version of the Topic Paper represents the revised position of the council as of November 2024 and supports the proposed modifications to the Regulation 19 version of the Retrofit First policy. This Topic Paper therefore supersedes the previous version published as part of the Regulation 19 consultation.

Structure of this Topic Paper

1.1.4 The Topic Paper is structured as follows:

- Section 1 – Introduction

  This section provides context on the purpose of the topic paper.

- Section 2 – The climate emergency

  This section provides details on the wider context to the Retrofit First policy. It covers climate change emergency matters and how they relate to the built environment sector and provides an overview of the ways in which buildings generate carbon emissions. This section reviews the climate emergency and the impact of the built environment specific to the Westminster.

- Section 3 – Current framework

  This section provides an overview of what the current policy context is with regards to development in Westminster, incorporating national, regional and local policies. Building upon this analysis of existing policies, this section provides an overview of how the existing policy landscape has impacted upfront embodied carbon emissions in Westminster. This provides a

baseline to demonstrate the nature of the relationship between embodied carbon and development coming forward under existing policies.

- Section 4 – Policy scoping

  As Sections 2 and 3 highlight the need for, and current gaps in, existing policies to reduce upfront embodied carbon emissions, this section provides an overview of how the council developed a Retrofit First policy. This includes initial work with stakeholders to understand what the scope of the policy should be, evaluation of practices of other London authorities, and the review of consultation feedback received.

- Section 5 – Policy development

  Building upon Section 4, this section gives further details on the proposed Retrofit First policy, and the rationale behind the inclusion of each section within the policy wording. This incorporates an analysis of existing planning application trends, the commissioning of evidence to test feasibility, and the review of other emerging standards relevant to retrofitting and upfront embodied carbon. This section also provides an overview of how the development of the Retrofit First policy for Westminster can influence the development of other future policies on this important topic.

- Section 6 – Policy implementation

  Section 5 provides an overview of how the draft policy would be implemented and describes the additional guidance and tools which will be available to assist with this.

- Section 7 – Conclusion

  The final section provides a conclusion of the findings of the Topic Paper and key takeaways that have informed the draft policy.

2. The climate emergency

2.1 Climate change and the built environment

The climate change challenge

2.1.1 It is widely recognised that climate change is one of the biggest challenges facing society. The role of greenhouse gas emissions in man-made changes to the climate have become one of the most important policy areas across all forms of governance, from local, national to international. The UK is a signatory to the Paris Agreement (2015) which requires the UK to play its part in ensuring that global heating remains below 2°C, and ideally below 1.5°C. The catastrophic impacts of failing to meet this target mean that Local Planning Authorities have a moral responsibility to support the transition towards a low-carbon economy, and to reduce greenhouse gas emissions where possible.

2.1.2 Through the Climate Change Act (2008) the UK government has legislated a net-zero emissions target by 2050, and in 2021 through the Climate Change Committee's Sixth Carbon Budget, where an interim target was set to run a net-zero power system and reduce emissions by 78% by 2035. Section 19 of the Planning and Compulsory Purchase Act (2004) makes it clear that local development plan documents should include policies designed to secure the development and use of land contributes to the mitigation of, and adaptation to, climate change. Taking the UK government legal requirement of reaching a net-zero emissions target by 2050, as stated within the Climate Change Act, the council's Development Plan should incorporate policies that contribute towards the net-zero target and as whole, support the mitigation of climate change.

The contribution of the built environment towards climate change

2.1.3 The built environments contribution towards climate change is complex and multifaceted. The construction, operation and decommissioning of the built environment is all associated with significant emissions, but is the basis for the vast majority of economic, cultural and social activity in the UK. Ensuring the correct supply of building stock to achieve social and economic benefits is of paramount importance, however this comes at an environmental cost: it is estimated that 40% of the UK's emissions are linked to the built environment, either through construction, operations or demolition.[1] A parliamentary report in 2022 estimated that "*construction activity [accounts] for around 50 million tonnes of CO_2 emissions, over half of which is linked to construction product and materials production, particularly materials such as steel and cement, which account for around 15% of global carbon emissions*".[1]

2.1.4 A key challenge for planning policy is to use Local Plans to reduce these emissions whilst also ensuring a sustainable supply of buildings to meet social and economic needs, in a manner which does not compromise the UKs legal and moral obligations to reduce emissions.

[1] UK Government Commercial Function – Promoting Net Zero Carbon in Sustainability and Construction – Guidance Note, September 2022 [Online] Available from: https://assets.publishing.service.gov.uk/media/631222898fa8f54234c6a508/20220901-Carbon-Net-Zero-Guidance-Note.pdf

2.2 Understanding carbon emissions and the built environment

2.2.1 The whole life carbon emissions associated with the built environment are a mix of embodied and operational emissions. Embodied emissions are associated with the extraction, transport, manufacture, installation, and assembly of construction materials, and maintenance, disassembly or demolition activities, waste, and end-of-life impacts. These emissions can therefore occur both at the site of the building, as well as being emitted where construction materials are manufactured. This can therefore mean that these emissions are scattered across the globe, depending on supply chains. Operational emissions are those associated with the day-to-day usage of a building, directly impacting carbon footprint within its location.

2.2.2 Figure 1 from the Royal Institution of Chartered Surveyors (RICS)[2], demonstrates carbon emissions across the building lifecycle, highlighting the differences between embodied and operational carbon.

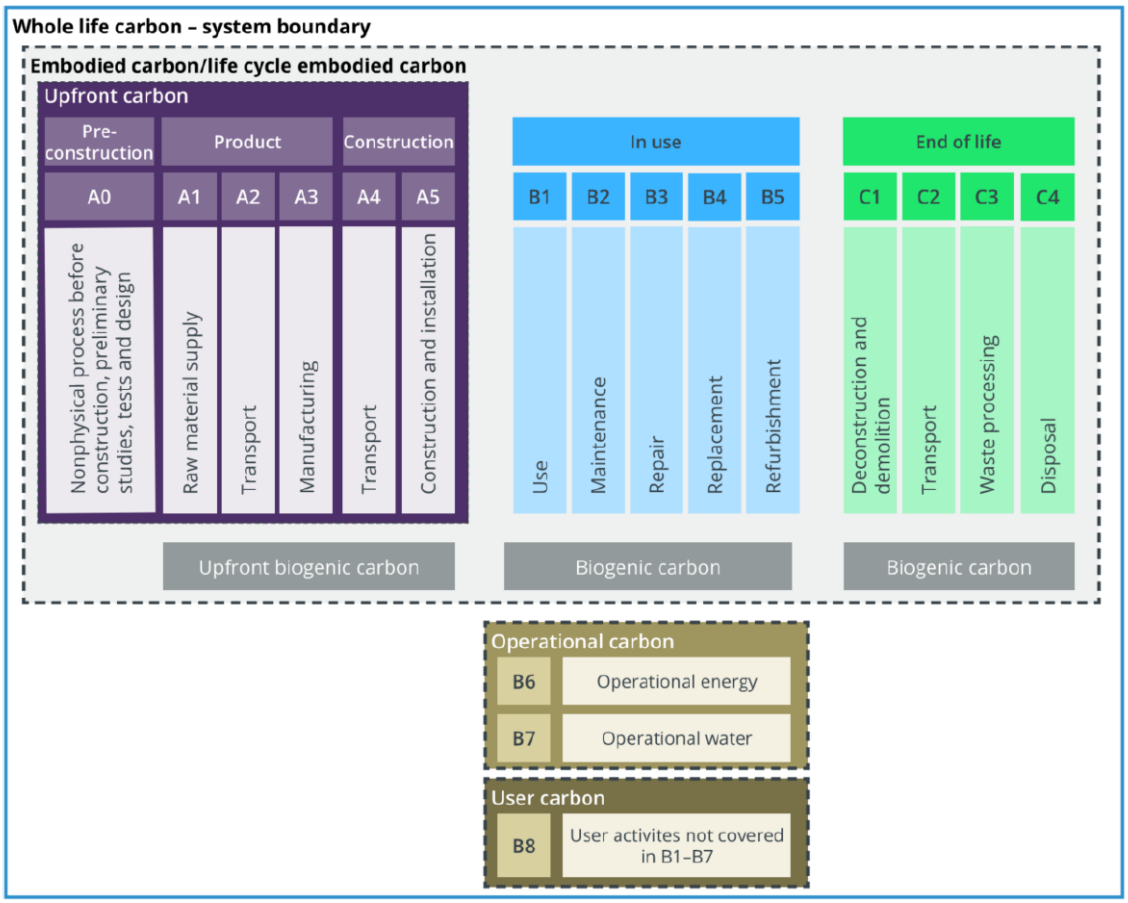


Figure 1: Whole life carbon of buildings. Reproduced from the RICS Professional Standard – Whole Life Carbon Assessment for the Built Environment, Second Edition

[2] Royal Institution of Chartered Surveyors (RICS) Professional Standard – Whole Life Carbon Assessment for the Built Environment – Second Edition, 2024. Available from: https://www.rics.org/profession-standards/rics-standards-and-guidance/sector-standards/construction-standards/whole-life-carbon-assessment

2.2.3 As is shown in Figure 1, whilst many are well aware of the fact that buildings emit carbon emissions during operation (for example, through energy usage), there are also a broad range of other considerations beyond just operational carbon which cumulatively add up to represent the overall impact of buildings.

Upfront embodied carbon

2.2.4 The carbon emissions from construction result in what is known as embodied carbon, taken to be carbon emissions up to the point of completing building works (including any alterations, refurbishment and extensions to a building) and any material amendments, such as facade or interior replacements throughout the lifetime of the building.[2] Upfront embodied carbon is usually taken to refer to all of the CO_2 emitted during principal construction phase from demolition and site clearance; production of materials and their transport and processing; and their installation on site.

2.2.5 Building upon Figure 1, Figure 2 below provides an overview of the typical proportion of carbon emissions for new buildings in Westminster when decarbonisation is either factored in or out. Decarbonisation of the energy grid in the future will mean that there is greener energy supplying our buildings (thereby reducing the impact of operational emissions) and can also mean that the energy used to produce building materials is greener, and less carbon intensive too. Modelling scenarios with decarbonisation can therefore demonstrate the future projections for built environment impacts.

2.2.6 Figure 2 highlights that upfront embodied carbon emissions make up ~61% of a new building's emissions when decarbonisation is considered, or ~37% when it is not.[3] Therefore, even taking a conservative estimate assuming no decarbonisation will occur highlights that upfront embodied carbon is as important as operational energy, which has traditionally been the primary focus of the development of sustainable buildings.

[3] Analysis undertaken by Westminster City Council officers based on data obtained on Whole Life Carbon Assessments of development schemes. Decarbonisation assumptions based on factors recommended within the RICS Professional Standard Whole Life Carbon Assessments- Second Edition.

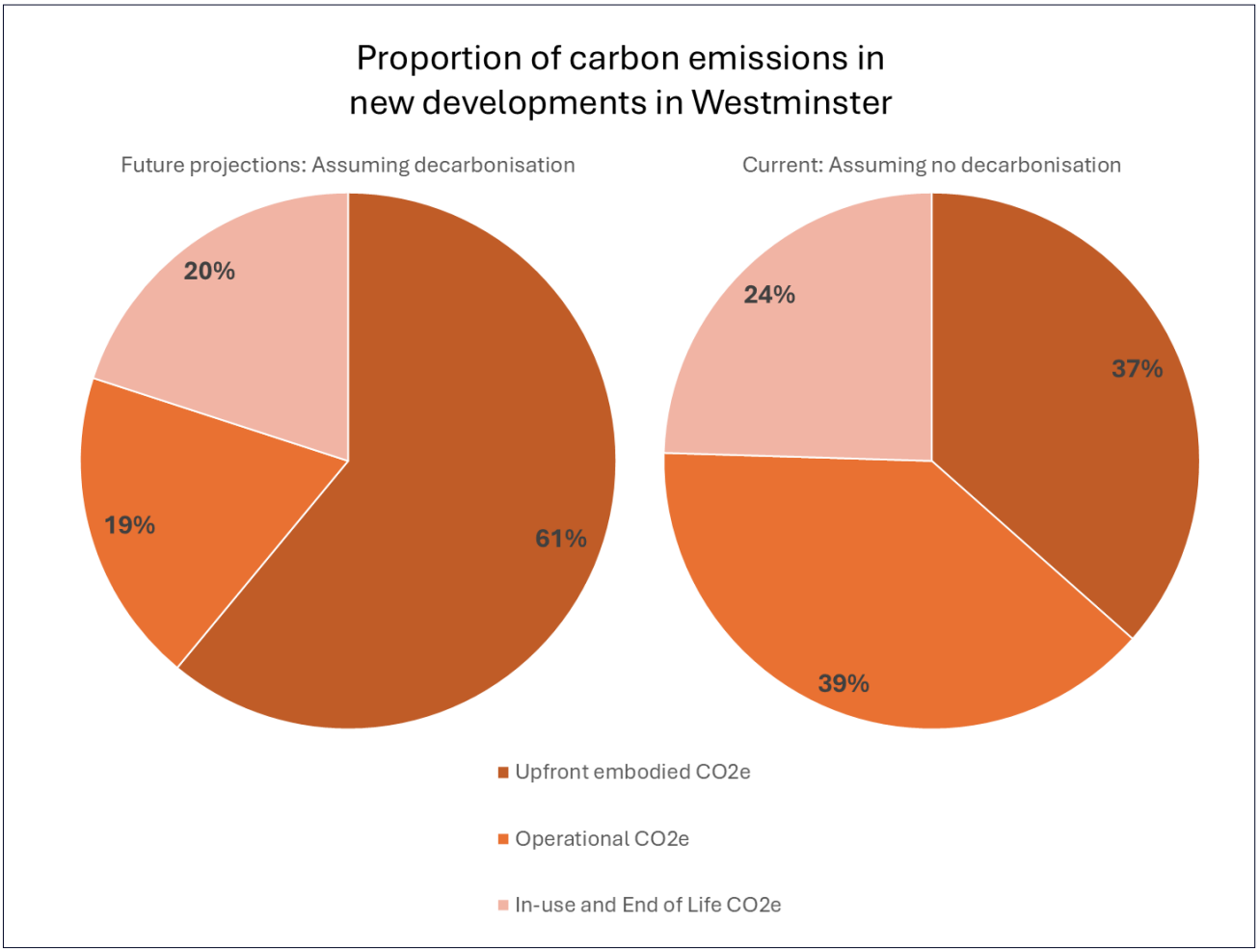


Figure 2: Whole life carbon emissions of new development in Westminster, assuming with and without decarbonisation

2.2.7 Unlike the carbon emissions associated with the operation of a building, upfront embodied carbon emissions will be less affected by grid-decarbonisation, as the manufacturing and processing of materials is energy and heat intensive which can be difficult to electrify. In addition, many construction materials used in the UK involve global procurement and supply chains, meaning that materials may come from countries where grid decarbonisation is not as progressed. Furthermore, when considering the whole life carbon emissions from a building, the emissions associated with upfront embodied carbon are immediately released into the atmosphere, whereas operational emissions occur over a period of time, and so there is more opportunity to avoid or reduce the release of these emissions.

2.2.8 Various industry bodies exist who set standards for calculating embodied carbon, and the most widely used methodology has been developed by RICS, which was recently updated in 2023 and effective from July 2024. Some existing industry bodies have attempted to set voluntary benchmarks for embodied carbon, with the aim of encouraging building designers to reduce the amount of carbon being emitted through development. The most notable of these are the Low

Energy Transformation Initiative (LETI)[4], the Royal Institute of British Architects (RIBA)[5], the UK Green Building Council (UKGBC)[6] and the UK Net Zero Carbon Building Standard (UKNZCBS).[7] Each benchmark is differentiated by what they include in their calculation of embodied carbon emissions. For example, LETI primarily focus on 'upfront' emissions – that is those emitted from demolition to the completion of construction, while RIBA focus on whole-life embodied carbon, therefore involving demolition, construction, remodelling and decommissioning of a building throughout its life. The UKNZCBS is a new Standard which seeks to create one consistent approach to measuring whole life carbon for buildings to effectively be deemed 'net zero'. The pilot version of the Standard was released in September 2024 and is subject to ongoing consultation.

2.2.9 Whilst there are a number of industry standards and methodologies for considering upfront embodied carbon (as a factor of overall whole life carbon emissions), the nature of these emissions means that they are not currently considered holistically in local, regional or national emissions targets. This is because these emissions are largely considered as 'Scope 3 emissions'. These are defined as all indirect emissions that occur in the value chain of the reporting organisation, including both upstream and downstream emissions. This means that whilst these emissions are evidently a large proportion of emissions associated with the built environment, they remain largely unregulated and do not form the basis of any national, regional or local targets to reach 'net-zero'.

In-use embodied carbon emissions

2.2.10 Upfront embodied carbon, as described above, is not the only embodied carbon emissions associated with a building. Embodied carbon emissions also include in-use embodied carbon. This refers to the emissions associated with the materials and processes needed to maintain and refurbish the building whilst it's in use.

End of life embodied carbon emissions

2.2.11 The final key area of embodied carbon is end-of-life embodied carbon. These emissions are largely from demolition, both the physical demolition itself and the associated waste processes which may occur at the end of a building's life. These emissions are also considered embodied carbon emissions, but unlike material manufacturing – there are more mechanisms to divert or avoid these emissions. The most effective way to reduce demolition emissions is to encourage and require construction projects to re-use as much on-site materials as possible, ideally in-situ – or close by the site. This also has the added benefit of reducing the amount of materials required in the construction process, lowering the overall embodied carbon. Construction waste accounts for the majority of waste in the UK.

[4] Low Energy Transformation Initiative (LETI) Whole Life Carbon & Embodied Carbon. Available from: https://www.leti.uk/carbonalignment

[5] Royal Institute of British Architects (RIBA) Whole life carbon assessment for architects. Available from: https://www.architecture.com/knowledge-and-resources/resources-landing-page/whole-life-carbon-assessment-for-architects?srsltid=AfmBOorDKdgYBmO8uafzfDkyI4AtzMhOkG_sv4FPbAhTp6GnywIdsaMu

[6] UK Green Building Council (UKGBC) Net Zero Whole Life Carbon Roadmap. Available from: https://ukgbc.org/our-work/topics/whole-life-carbon-roadmap/

[7] UK Net Zero Carbon Building Standard (UKNZCBS) Pilot Version of the UK Net Zero Carbon Buildings Standard. Available from: https://www.nzcbuildings.co.uk/pilotversion

Operational carbon emissions

2.2.12 Operational emissions are composed of the greenhouse gas emissions used to heat, power, cool, and run a building, along with servicing water usage. A large proportion of operational emissions will reduce over time due to the electricity grid being decarbonised, however this is co-dependent upon buildings transitioning towards electricity as the main mechanism to heat buildings and reducing the demands of the building for heating and cooling through greater operational efficiencies. A large proportion of buildings in Westminster are in need of adaptation to prepare them for this transition. An important balance should be struck however between lowering operational emissions and ensuring that the carbon intensity of the materials used to achieve this does not outweigh the reductions in operational carbon.

The climate emergency in Westminster

2.2.13 The effects of climate change are already being felt in Westminster. For example, in July 2021 extreme weather events led to significant flooding across Westminster, damaging a number of homes and businesses. In response to the changing climate, the council have declared a Climate Emergency and have set ambitious targets for the city to achieve net-zero by 2040. To support the delivery of a net-zero city, the council set up a Citizen's Assembly to provide advice on the ways in which the council help the city achieve its net-zero targets. Following the first meeting of the assembly, a recommendations report was produced and of these recommendations, three are of significant relevance to planning policy.[8] These include:

- Recommendation 3: Energy efficiency rating on any organisation, whether for profit or not, which owns, manages or occupies one or more non-residential buildings in Westminster, provides incentives for and assistance in hitting targets. Publish this data for transparency for the Council website and promote through WCC communication channels.
- Recommendation 4: It should be mandatory for all types of businesses to ensure that developers reuse and recycle materials and minimise energy use. This should be complemented by the revised one-stop circular construction website, that offers easy access to all.
- Recommendation 5: Make climate action the top priority when updating planning policies and documents and giving approvals. Pay particular attention to prioritising climate action in listed buildings.

2.2.14 The Assembly therefore provided clear guidance and a strong mandate for the council to pursue planning policies to achieve improvements in reducing construction waste and re-using materials, promoting energy efficiency in buildings, and making climate action the highest priority when developing planning policies.

[8] Westminster Citizens Climate Assembly (2023) Final Report. Available from: https://www.westminster.gov.uk/fairer-environment-hub/participate/climate-assembly/final-report

2.3 Westminster's carbon emissions

2.3.1 Westminster City Council declared a Climate Emergency in 2019 and has set a target for the council to be net-zero by 2030, for the city as a whole by 2040. Unlike the 2035 and 2050 UK government targets, these targets are not legally binding, but the council has a clear democratic mandate to deliver on these goals.

2.3.2 Westminster has the highest carbon emissions of any local authority in London estimated by the Government at 1,601KT of CO_2e per annum in 2022.[9] Across England, 296 local authorities had their emissions reported by Central Government for 2022. Westminster ranked 24th out of a total of 296, therefore placing it in the top 8% of the country.

2.3.3 The government emissions figures for Westminster include most activity in Westminster, but are calculated from operational emissions, and do not include the upfront embodied carbon resulting from development activity. Some upfront embodied carbon is recorded as manufacturing emissions, which are accounted for at source (for example in other authorities across the UK), however, the demand and derived benefit from these emissions is being driven by activity in Westminster.

2.3.4 As a result, there is an obvious conundrum. It is well understood that upfront embodied carbon emissions make up a large proportion of a building's whole life carbon emissions. Similarly, it is widely understood that the built environment is a major contributor to overall carbon emissions across society. Despite this, there is limited data available to estimate the scale of these emissions and their impacts. This is not only in the context of Westminster, but across all local authorities and regions in the UK, with limited data available nationally.

Obligations for climate action

2.3.5 In April 2024, the European Court of Human Rights (ECtHR) ruled that Switzerland had a responsibility under the European Convention on Human Rights (ECHR) to mitigate climate change effectively to protect the human rights of its citizens.

2.3.6 The judgment said that the right to a private and family life meant that states are obliged to protect their citizens from the "*serious adverse effects*" of climate change.[10] The court found that the Swiss Government had failed to comply with its obligations, because it had:

- failed to implement a domestic regulatory framework, including a failure to quantify national greenhouse gas emissions limitations (for example, through instituting a carbon budget); and
- failed to meet past greenhouse gas emission reduction targets.

[9] Department for Energy Security and Net Zero (2023) UK local authority and regional greenhouse gas emissions national statistics, 2005 to 2021. Available from: https://www.gov.uk/government/statistics/uk-local-authority-and-regional-greenhouse-gas-emissions-national-statistics-2005-to-2021

[10] House of Commons Library (2024) A new precedent for climate change in human rights law. Available from: https://commonslibrary.parliament.uk/a-new-precedent-for-climate-change-in-human-rights-law/#:~:text=In%20April%202024%2C%20the%20European,adverse%20effects%E2%80%9D%20of%20climate%20change.

2.3.7 The court's ruling developed the legal basis for alleged breaches of human rights provisions due to climate change, setting out a number of factors that countries taking action on climate change should be assessed against. These include:

- measures that indicate a specific target timeline to achieve net zero carbon emissions (or a specific reduction);
- intermediate greenhouse gas emission targets;
- evidence showing compliance with these targets;
- updates to targets based on best available evidence; and
- acting in good time.

2.3.8 The judgment also sets a precedent for other countries party to Article 8 of the ECHR to "*put in place the relevant legislative and administrative framework designed to provide effective protection of human health and life*".

2.3.9 Furthermore, the judgement also sets a precedent of providing a means to hear climate cases under Article 6 of the ECHR which protects the right to a fair trial. As the UK is a signatory to the ECHR, this means that such cases could be brought against the UK Government in the future. This further highlights the requirement to consider carbon emissions and relevant targets as a means of mitigating potential "serious adverse effects" arising from climate change in the future. Given the evident carbon emissions associated with the built environment, as discussed in this section, there is impetus for the council to act appropriately.

Nature of the built environment in Westminster

2.3.10 As stated in paragraph 2.1.3, it is estimated that 40% of the UK's emissions are linked to the built environment. In Westminster however, buildings account for 86% of emissions[11] and are therefore the largest contributor to emissions in the city. This demonstrates that while the role of the built environment in contributing to carbon emissions is important, this is especially pertinent in Westminster.

2.3.11 In terms of development coming forward across the city, the nature of development in Westminster is already skewed towards the retention and refurbishment of existing buildings. As is shown in Figure 3 below, 78% of the city is covered by conservation areas. Beyond these conservation areas, a number of buildings are designated heritage assets. In the context of the NPPF and existing City Plan policies on heritage, development is required to conserve and enhance heritage assets in a manner appropriate to the significance of the assets. In many cases, this restricts demolition. Where buildings are not listed or within a conservation area, it may be the case that they are instead in proximity to heritage assets, which could also restrict demolition through the consideration of other impacts such as views and neighbourhood character. As a result, Westminster as a city already sees a large number of development projects retaining and retrofitting existing buildings.

[11] Westminster City Council (2021) Climate Emergency Action Plan. Available from: https://www.westminster.gov.uk/fairer-environment-hub/understand/climate-action-plan

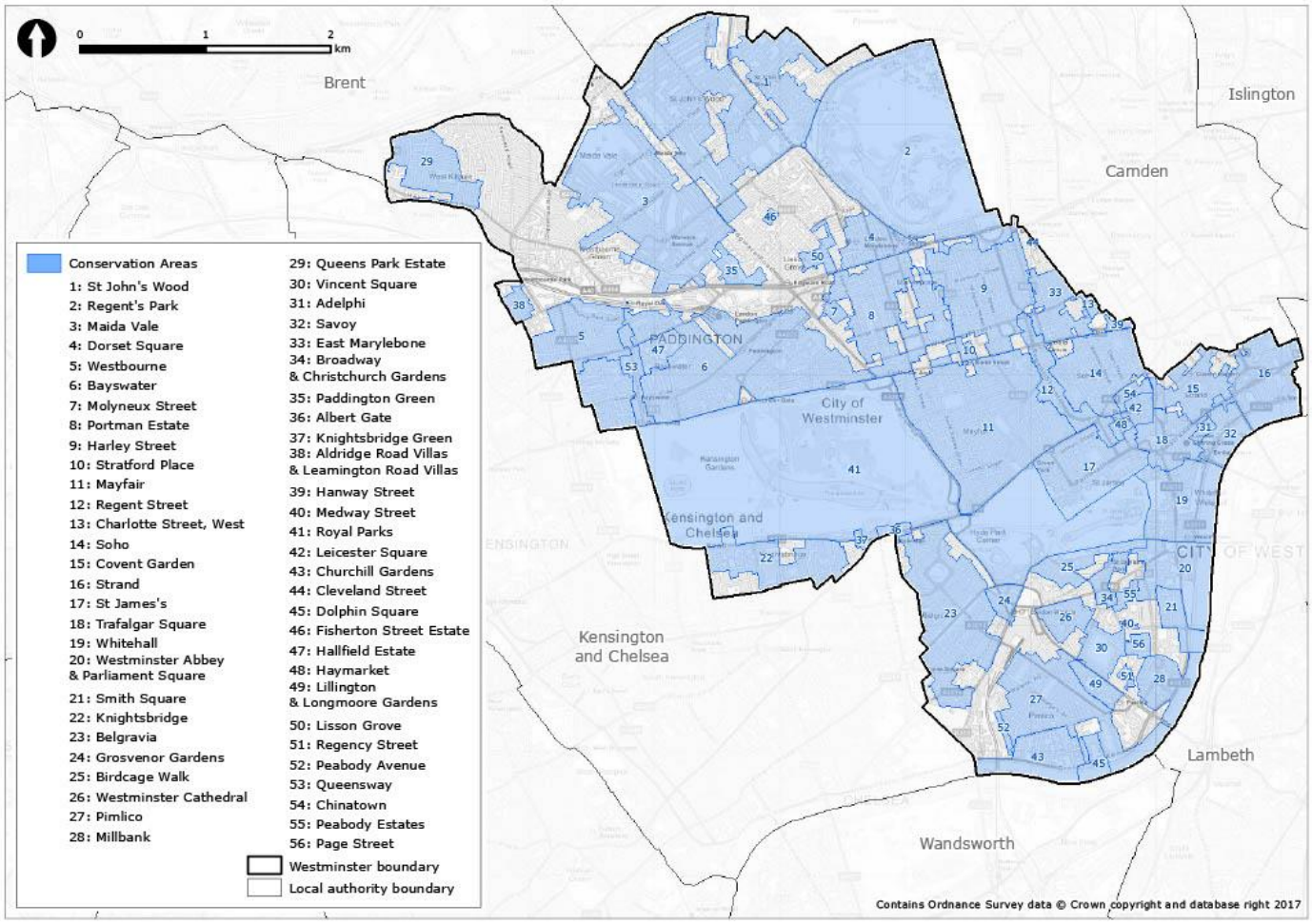


Figure 3: Conservation Areas in Westminster

2.3.12 Whilst the heritage context of Westminster may restrict demolition compared to other locations across the country, it also acts as an attractor for development, with future residents, businesses and visitors choosing to locate in the city due to its character. Equally, it is these historic buildings which are likely contributing to the high proportion of building emissions generated across Westminster. Whilst it is important to conserve these buildings, it is also important that they can adapt to changing climates and be sensitively upgraded to help to reduce operational emissions.

2.3.13 Another key point for consideration in understanding the nature of the built environment in Westminster is that the vast majority is brownfield land which is already developed. This means that usually, decisions around existing buildings on site and whether they should be retained or not are required to be made in any case. Introducing a process which seeks to maximise potential opportunities for the re-use of existing structures and the materials these are composed of, is therefore well placed in a local authority such as Westminster.

3. Current framework

3.1 Policy context

Climate change legislation

3.1.1 The Planning and Compulsory Purchase Act 2004 places a duty on local authorities to carry out plan-making with the "*objective of contributing to the achievement of sustainable development*." This is in conjunction with the Planning Act 2008 which placed an additional obligation on local authorities to ensure that: "*Development plan documents must (taken as a whole) include policies designed to secure that the development and use of land in the local planning authority's area contribute to the mitigation of, and adaptation to, climate change*." This was in parallel with the Climate Change Act 2008 which established a legally binding target to reduce the UK's greenhouse gas emissions by at least 80% in 2050 from 1990 levels.

National Planning Policy Framework

3.1.2 In Chapter 2 of the National Planning Policy Framework (NPPF) September 2023[12], paragraph 7 states that: "*the purpose of the planning system is to contribute to the achievement of sustainable development.*" The achievement of sustainable development is based on three core principles comprising economic, social and environmental objectives. The environmental objective is elaborated on as a means to: "*protect and enhance our natural, built and historic environment…mitigating and adapting to climate change, including moving to a low carbon economy."*

3.1.3 In balancing the three objectives of economic, social and environmental sustainability, paragraph 11 establishes a presumption in favour of sustainable development. For plan-making, this requires that: "*all plans should promote a sustainable pattern of development that seeks to: meet the development needs of their area; align growth and infrastructure; improve the environment; mitigate climate change (including by making effective use of land in urban areas) and adapt to its effects."*

3.1.4 Chapter 14, paragraph 152 of the NPPF September 2023 states that: "*The planning system should support the transition to a low carbon future in a changing climate... It should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions*." Furthermore, paragraph 153 requires that: "*Plans should take a proactive approach to mitigating and adapting to climate change*."

3.1.5 Taking the relevant national policies into consideration, it is evident that there is a requirement for local plans to factor in climate change and the reduction of greenhouse gas emissions.

[12] It is noted that the NPPF was updated in December 2023. However, the policies in the updated December 2023 NPPF will apply for the purpose of examining plans where those plans reach Regulation 19 of the Town and Country Planning (Local Planning) (England) Regulations 2012 (pre-submission) stage *after* 19 March 2024, as stated within the NPPF (December 2023) Annex 1 on Implementation [see paragraph 230]. Given that the Westminster City Plan Partial Review will reach this stage prior to 19 March 2024, the previous version of the NPPF (dated September 2023) has been relied upon instead.

The London Plan 2021

3.1.6 In the regional development plan for Greater London, policies relating to climate change, retrofitting and whole life carbon are supported.

3.1.7 Policy SI 2 of the London Plan 2021 requires all major developments to be net zero carbon, applying the energy hierarchy to reduce operational greenhouse gas emissions. It also requires planning applications referable to the Mayor of London to calculate whole life carbon emissions and to demonstrate actions to reduce life-cycle carbon emissions. As part of the Whole Life Carbon Assessments, applicants are required to explore options to retain existing built structures for reuse and retrofit, in part or as a whole, stating that this should be prioritised before considering substantial demolition.

3.1.8 Policy SI 7 sets out principles to achieve a circular economy and requires applications referable to the Mayor of London to provide a Circular Economy Statement. It also supports development plans to set out lower thresholds for Circular Economy Statements and sets a target of 95% or more of deconstruction and excavation waste being diverted from landfill.

3.1.9 The London Plan Guidance (LPG) on Whole Life Carbon (March 2022) sets out a methodology for how embodied carbon should be calculated in Whole Life Carbon reports. Appendix II of the LPG contains advisory benchmarks for applicants for embodied carbon. For office developments for example, this sets a minimum benchmark of 950kg CO_2e/sqm and an aspirational target of 600kg CO_2e/sqm.

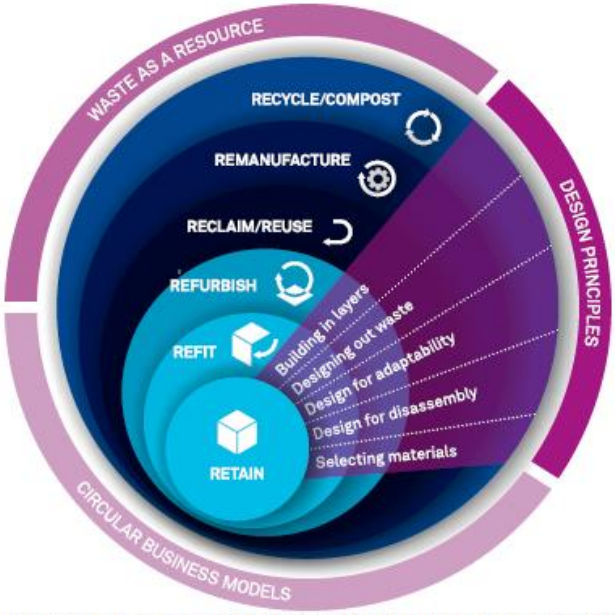
3.1.10 As currently drafted, the LPG does not factor grid-decarbonisation into Whole Life Carbon Assessments, and the justification of this is due to the challenges associated with calculating the impact of grid decarbonisation on embodied carbon. While it is accepted that life-cycle embodied carbon may be hard to predict if grid-decarbonisation is factored in, it is not the case that upfront embodied carbon is difficult to factor in grid decarbonisation as carbon factors of materials are calculated at the time of their production, and these calculations will use the current carbon factor of any electricity used in their production. As a result, Whole Life Carbon calculations can be skewed heavily, as they can assume a continuous level of carbon emissions across their life cycle – and do not account for operational emissions reducing in line with grid decarbonisation. If grid decarbonisation was fully factored into Whole Life Carbon reports, then the role of embodied carbon would become far more apparent as it would constitute a far greater proportion of the overall whole life carbon. This is as demonstrated in Figure 2.

3.1.11 The current LPG is also drafted to use the RICS first edition standard as the methodology for calculating whole life carbon emissions. As noted in Section 2 of this document, that standard was updated in 2023 and came into effect in July 2024.

3.1.12 Outside of climate change the London Plan contains several policies which are often considered relevant to considering whether to retrofit or demolish and replace a building, specifically Policy D3- Optimising Site Capacity through a design-led approach. This strategic policy requires that development make the best use of London's finite land but ensuring that the density is optimised. Policy D3.B states that Opportunity Areas should be identified for higher density development. Outside of Opportunity Areas, Policy D3.A requires that development should be the most appropriate form and land use for the site. This strategic policy generally gives a policy framework for considering the replacement of buildings.

3.1.13 Paragraph 3.3.12 and Figure 3.2 of the London Plan are also of importance. Figure 3.2, quoted below as Figure 4 in this Topic Paper, "*shows a hierarchy for building approaches which maximises use of existing materials*" which is reproduced below.

Figure 3.2 - Circular economy hierarchy for building approaches



Source: Building Revolutions (2016), David Cheshire, RIBA Publishing ©

Figure 4: Figure 3.2 reproduced from the London Plan 2021

3.1.14 Paragraph 3.3.12 of the London Plan goes on to state that development should work "*through refurbishment and re-use through to the least preferable option of recycling materials produced by the building or demolition process. The best use of the land needs to be taken into consideration when deciding whether to retain existing buildings in a development*". The approach therefore requires policies to ensure that when considering replacing buildings, which have poor circular economy outcomes compared to retrofit, that the use of land proposed significantly improves on the potential offered by the existing building (i.e. is the "best" use of land).

3.1.15 In addition to the policies listed above, Policy SD4 of the London Plan requires that the nationally and internationally significant office functions of the Central Activities Zone (CAZ) should be supported and enhanced by all stakeholders, including the intensification and provision of sufficient space to meet demand for a range of types and sizes of occupier and rental values. Furthermore, Policy SD5 also requires that new residential development should not compromise the strategic functions of the CAZ. These policies highlight the importance of the CAZ in prioritising commercial developments, due to the regional, national and international importance of the area. To this degree, any policies which impact development within the CAZ (of which makes a large proportion of Westminster), need to balance support for a range of different office spaces to meet various needs, whilst reinforcing the locational benefits of commercial development in this area.

3.1.16 Finally, of importance to climate focussed planning policy is the London Plan approach to carbon offsetting. Residual operational emissions to offset are calculated using achieved reductions below Part L of the Building Regulations. It is relatively well established that achieving the highest reductions below Part L usually requires greater amounts of materials and associated embodied carbon. This can therefore mean that when a development scheme is trying to reduce operational carbon emissions, this can result in perverse outcomes for whole life carbon, as the upfront

embodied emissions to achieve enhanced performance in operation can negate any operational carbon emission benefits.

The City Plan 2019 – 2040 (adopted April 2021)

3.1.17 The overarching vision of the current City Plan 2019 – 2040 includes the objective to create a city that will be sustainable for generations to come, with Westminster's spatial strategy requiring the adaptation to and mitigation of the effects of climate change.

3.1.18 Policy 36 of the City Plan states that the council will promote zero carbon development, with Part B of the policy stating that: "*All development proposals should follow the principles of the Mayor of London's energy hierarchy. Major development should be net zero carbon and demonstrate through an energy strategy how this target can be achieved*."

3.1.19 Policy 37 reinforces the London Plan objectives of promoting a Circular Economy. In addition to this, Policy 38 requires development to extend the lifetime of buildings and spaces and respond to the risks and likely consequences of climate change. This is set out by a number of sustainable design principles.

3.1.20 Policy 38 sets out that new development will incorporate exemplary standards of high quality, sustainable and inclusive urban design and architecture befitting Westminster's world-class status, environment and heritage and its diverse range of locally distinctive neighbourhoods. As part of how this is defined, the Plan goes on to state that "*As new developments are large consumers of resources and materials, the possibility of sensitively refurbishing or retrofitting buildings should also be considered prior to demolition and proposals for substantial demolition and reconstruction should be fully justified on the basis of whole-life carbon impact, resource and energy use, when compared to the existing building.*"

3.1.21 The issue with the current approach is that no locally specific guidance is in place for how consideration for retrofit versus new build development options should be compared. Furthermore, as the London Plan Guidance for Whole Life Carbon usually forms the basis for any options appraisal exercises, the options can be skewed given that grid-decarbonisation is usually not factored in. Finally, these appraisal reports usually present dramatically different assumed life spans for new builds versus retrofitted buildings, which further compounds the results as long assumed life spans of new builds, along with distorted (by excluding grid-decarbonisation) assumed savings in operational carbon emissions, usually favour new buildings.

3.1.22 The current City Plan approach to carbon offsetting is set out in the Planning Obligations and Affordable Housing SPD. The local cost of carbon in Westminster is set at £880, however this is reduced to £330 for electrical and district heat sourced emissions.

Adopted Neighbourhood Plans

3.1.23 Several of the adopted neighbourhood plans in Westminster contain policies promoting retrofitting, including:

- Belgravia Neighbourhood Plan - Policy BEL2: Energy efficiency including retrofitting historic buildings
- Soho Neighbourhood Plan - Policy 21: Refurbishment and Retrofitting of Existing Buildings

- Knightsbridge Neighbourhood Plan - Policy KBR36: Retrofitting historic buildings for energy efficiency.

3.1.24 The inclusion of policies relating to retrofitting reiterate the importance placed on the issue of retaining and re-using buildings to local people.

Non-statutory context

3.1.25 In addition to the statutory and policy framework outlined above, the Achieving Net Zero report by the National Audit Office (December 2020)[13] states that "*Local authorities have significant scope to influence emission in their area*" reinforcing that "*Local authorities…have critical roles in the achievement of net zero*". Similarly, the Government's Net Zero Strategy: Build Back Greener (October 2021)[14] estimates that: "*82% of the UK's emissions are within the scope of influence of local authorities".*

Recent legal decisions

3.1.26 The council is aware of the recent outcomes of *R (on the application of Finch on behalf of the Weald Action Group) v Surrey County Council and others [2024] UKSC 20* (hereafter "Finch"). This case came before the Supreme Court and considered whether under Directive 2011/92 EU of the European Parliament and of the Council and the Town and Country Planning (Environmental Impact Assessment) Regulations 2017, whether it was unlawful for Surrey County Council to not consider the environmental impacts of Scope 3 emissions associated with a project involving crude oil extraction.

3.1.27 The court ruled that that an authority has discretion as to what to include in a Strategic Environmental Assessment (SEA), subject to challenge on irrationality grounds. Under Finch's circumstances where the emissions in question were inevitable and unquantifiable, the Supreme Court ruled that there was a requirement to include these in the Environmental Statement under the Environmental Impact Assessment (EIA) Directive. This was because their inclusion was deemed to be appropriate and rational, as any reductions in the Scope 3 emissions would likely have a significant effect on the environment (defined by Article 5 and Annex I of the SEA Directive).

3.1.28 The Supreme Court decision in Finch is still recent, and it will take some time for the implications to be fully worked out (likely through further court cases) so there is some uncertainty as to how the scope of EIA/SEAs should be approached. What is evident however, that there is a precedent set that tests the inclusion of Scope 3 emissions based on whether it is irrational to do so, linking to whether these emissions could have a significant impact on the environment. In the context of Westminster's City Plan, it is therefore possible for challenges to be made (similar to those also discussed in Section 2.3 regarding the ECtHR) to the scope of planning policies and their responsiveness to environmental objectives to reduce the impacts of climate change.

[13] National Audit Office (2020) Report – Value for Money. Achieving Net-Zero. Available from: https://www.nao.org.uk/reports/achieving-net-zero/

[14] Department for Energy Security and Net Zero and Department for Business, Energy & Industrial Strategy (2021) Net Zero Strategy: Build Back Greener. Available from: https://www.gov.uk/government/publications/net-zero-strategy

Analysis of policy context

3.1.29 The existing Westminster Development Plan has strong provisions relating to sustainable design, energy use, and ensuring appropriate density and design of buildings. The existing City Plan does include explicit details on how sustainable design is to be achieved, including the justification of new buildings taking into account whole life carbon impacts. As was explored earlier in this Topic Paper, while whole life carbon is important – the immediate reduction of emissions in the short term means that it is the upfront embodied carbon element which is most critical to implementing an urgent reduction of emissions. The only benchmark for carbon emissions currently is within the London Plan Guidance, which contains voluntary benchmarks for referrable schemes. There is no current requirement or approach which would ensure that embodied carbon emissions are reduced as far as possible, which would lead to a lower whole life carbon for development – and importantly reduce immediate sources of emissions. It is therefore clear that the current Development Plan contains insufficient measures to lower embodied carbon.

3.1.30 It is also evident that there is a crucial gap in national policy. As articulated by the report 'Retrofit First, Not Retrofit Only' by the London Property Alliance[15], national government has failed to keep up with the fast-changing needs of development, amid an increasingly polarised public debate. This is true with regards to environmental matters, including issues around embodied carbon, meaning that local authorities across the country are now developing their own local policies on issues involving retrofit and the embodied carbon of buildings.

3.1.31 The current fragmented approach also presents problems with the methodology used to calculate whole life carbon in appraisal exercises looking at retrofit versus new build options in planning applications. A clearer, more consistent, method needs to be established which makes fair comparisons between development options.

3.1.32 Taken together, it is evident that to achieve the broader national aims of achieving a net-zero carbon society, a significant role will need to be played by local authorities. A key area of influence from local authorities is in the development of planning policies and the management of development through planning decision making. This is reinforced through national planning legislation and policy which provides support for regional and local policies to decrease carbon emissions in response to climate change.

3.1.33 Whilst policies at the regional level do account for carbon emissions, these largely focus on operational energy, ignoring the significant impact of embodied carbon. Furthermore, as per the London Plan, Whole Life Carbon Assessments and Circular Economy Statements only apply to largescale developments which are of a size referable to the Mayor of London. Whilst they are encouraged for other major developments, this still misses developments across varying scales which have a significant cumulative impact. Furthermore, it is unclear whether the voluntary benchmarks found in the London Plan Whole Life Carbon Guidance are suitable for achieving a net-zero city, especially as they are no longer reflective of trends seen in whole life carbon reporting and are based on a now outdated methodology. More evidence will be referred to in subsequent sections of this Topic Paper which will discuss the suitability of the London Plan benchmarks and the establishment of alternative requirements.

[15] London Property Alliance (2024) Retrofit First, Not Retrofit Only: Future-proofing national policy to support sustainable development. Available from: https://7705023.fs1.hubspotusercontent-na1.net/hubfs/7705023/LPA%20-%20Retrofit_First_Not_Retrofit_Only_Future-proofing_national_policy(21.5.24).pdf

3.1.34 The council is of the view that there are considerable benefits associated with reducing carbon emissions. The Retrofit First policy aims to deliver wider sustainability and climate related benefits. This is reinforced by recent legal decisions which demonstrate a precedent for factoring in wider factors into decision making, such as the consideration of Scope 3 emissions.

3.2 Baseline

Estimating the scale of upfront embodied carbon emissions in Westminster

3.2.1 As the latest available data on carbon emissions from central government is from 2022, a review was carried out to understand the scale of upfront embodied carbon emissions resulting from council decision making processes on planning applications in 2022. To do this, major schemes were reviewed to understand if Whole Life Carbon Assessments were submitted. If so, what the total upfront embodied carbon emissions were for these schemes. A few caveats are noted:

- This review looked at decisions made by the council in 2022. This therefore includes schemes submitted to the council between the years 2018 and 2022.
- It was not a requirement for all major development to prepare a Whole Life Carbon Assessment. Some have prepared assessments, which may be due to London Plan policies on Whole Life Carbon and/or done to demonstrate sustainable design considerations under existing adopted City Plan Policy 38.
- Upfront embodied carbon is carbon associated with the construction phase. Therefore, these emissions could be emitted over a time period beyond one year – depending on the nature of the scheme and the length of the construction period. However, they were reviewed for illustrative purposes to demonstrate the impact of decisions made within one year.

3.2.2 According to the Ministry of Housing, Communities and Local Government (MHCLG), in 2022, 1,674 planning applications were granted permission. Of these, 21 were major schemes and 1,653 were minor schemes. Of the 21 major schemes granted permission, eight supplied Whole Life Carbon Assessments. These results are shown in Table 1 below.

Table 1: Upfront embodied carbon in major schemes granted planning permission in 2022, where Whole Life Carbon was reported[16]

Application reference[17]	A1-A5[18] $kgCO_2e/sqm$	A1-A5 tonnes of CO_2e
1	651	11,254
2	833	40,460
3	530	5,213
4	991	19,233
5	641	27,578
6	641	645
7	732	14,668
8	778	2,910

3.2.4 Taken together, these eight schemes reported (via publicly available assessments, submitted at the time of planning application) equated to 121,962 tonnes of CO_2e. This is equivalent to 122 kilo tonnes (KT) of CO_2e. It is important to note that this figure is derived from only eight schemes, comprising only 0.5% of the planning applications granted consent in 2022. Whilst the majority of the other schemes approved in 2022 would have been minor schemes and therefore of a much smaller scale, the fact that this data only represents 0.5% of all schemes demonstrates that it is likely to be a very conservative estimate of the wider scale of upfront embodied carbon accepted by the council in planning decisions each year.

3.2.5 Notwithstanding the fact that the sample size is small, the 122 KT demonstrated by the eight schemes in Table 1 above is a significant figure. Considering the city-wide emissions in 2022 was 1,601 KT, this is equivalent to 7.6% of annual emissions. For context, the operational energy requirements of all public sector buildings in the city in 2022 was 158 KT (9.8%).

3.2.6 Whilst the data presented in Table 1 is not currently considered in local authority emissions reporting, comparing magnitudes of scale is helpful to understand the nature of the emissions associated with construction and how these compare to emissions currently regulated.

Considering scale of construction activity in Westminster

3.2.7 In addition to the Government statistics reporting on annual performance, the London Energy and Greenhouse Gas Inventory (LEGGI) also produce annual reports on emissions.[19] The latest reporting available is from 2021. Whilst this data also does not account for upfront embodied carbon emissions, is does provide some statistics for Non-Road Mobile Machinery (NRMM) as used for construction purposes. These emissions would be attributed to individual construction projects

[16] For illustrative purposes, these figures reflect data from the planning application submission, where Whole Life Carbon was reported. These figures may have changed through the determination of the application and/or subsequently through amendments, or during the construction phase. However, it is not expected that the scale of carbon emissions would drastically alter and therefore these remain representative for the purposes of this exercise.

[17] Data obtained from the planning submissions for 20/00586/FULL, 20/03307/FULL, 21/01138/FULL, 21/01508/FULL, 21/05110/FULL, 21/08497/COFUL, 22/00178/FULL, 22/05428/FULL

[18] A1 – A5 refers to the life cycle modules for whole life carbon, which represent upfront embodied carbon. See Figure 1.

[19] London Energy and Greenhouse Gas Inventory (LEGGI)- Available from: https://data.london.gov.uk/dataset/leggi

and then counted as upfront embodied carbon emissions within a Whole Life Carbon Assessment (if a development scheme were to prepare one). In the absence of detailed data on the scale of emissions arising from all elements of upfront embodied carbon, it is interesting to note that the LEGGI data reports that in 2021 construction NRMM accounted for 45 KT of CO_2e in Westminster. This was the highest of any authority in London. Given the total CO_2e from construction NRMM in London was 424 KT in 2021, Westminster (despite being one of 33 authorities across London), was responsible for 11% of construction emissions. This highlights that Westminster has a high degree of construction activity occurring throughout the city, which disproportionately contributes to construction activity across London.

Understanding current practice

3.2.8 Baselining has been undertaken to understand what the current performance is of developments across London, and Westminster more specifically.

3.2.9 The London Plan 2021 requires referrable schemes to submit Whole Life Carbon Assessments, and Circular Economy Statements, and the council is also seeing an increasing number of applicants submit similar documents for non-referrable major schemes, based on the principles set out within adopted Policy 38 of the City Plan. Generally, applicants submitting Whole Life Carbon Assessments are usually exemplars of current best practice in the city. Details from these schemes were reviewed to understand current performance within Westminster.

3.2.10 Given the fact that not all developments are required to submit Whole Life Carbon Assessments in Westminster, further data from other sources was reviewed. This included data obtained by respondents during the Regulation 19 consultation period. This incorporated:

- Collated data on the Whole Life Carbon reported to the Mayor of London by referrable schemes (prepared by Arup and submitted by the Westminster Property Association)
- Data from Landsec on recent development schemes in London
- Data from the Future Homes Hub[20]
- Data reviewed within the City of London '*Refurbishing the City – insights into current best practice'* document prepared with consultants Hilson Moran.[21]

3.2.11 Together, these data sources have been used to demonstrate what current practice under the existing policy framework is achieving.

Review of applications received by Westminster

3.2.12 Data has been obtained for 40 major planning applications within Westminster. It is recognised that the trends are from limited datasets, and some relate to applications that are live at the time of writing, and so have been anonymised. This demonstrates that without a stringent requirement, development is only presenting whole life carbon reporting in limited circumstances.

[20] Future Homes Hub (2024) Whole life carbon conventions and simple tool. Available from: https://www.futurehomes.org.uk/wlc-tool

[21] City of London (2024) Refurbishing the City – insights into current best practice. Available from: Refurbishing the City – insights into current best practice (cityoflondon.gov.uk)

3.2.13 What is promising about this historical data however is that the average for new buildings is generally reported to be below the current London Plan Guidance minimum benchmark of 950kgCO_2e/sqm for offices, and 850kgCO_2e/sqm for residential and retail developments. The trend in the figures also clearly show the general carbon savings associated with retrofit schemes.

3.2.14 Many refurbishments or lighter touch retrofits are likely to be associated with far lower embodied carbon emissions, however, there is a lack of data on this, due to the fact that many schemes undertaking this type of work do not require planning permission and therefore an assessment of this nature is not undertaken. Similarly, it is likely that many new buildings in Westminster are associated with higher embodied carbon emissions. As it is currently a voluntary assessment to undertake for some schemes, it is therefore likely that where applicants are reporting whole-life carbon, this is generally in instances where designers are actively seeking to minimise emissions wherever possible. This may therefore be skewing the data to reflect only high performing schemes. The data from applications submitted to WCC is summarised in Table 2 below.

Table 2: Summary of upfront embodied carbon emission statistics from WCC applications, A1-A5

Development type	Upfront embodied carbon-commercial	Upfront embodied carbon-residential
Average all schemes	526 kgCO_2e/sqm	584 kgCO_2e/sqm
Average new build	676 kgCO_2e/sqm	704 kgCO_2e/sqm
Average retrofit	453 kgCO_2e/sqm	223 kgCO_2e/sqm

Greater London Authority – Whole life carbon data on referrable schemes

3.2.15 During the Regulation 19 consultation, additional evidence was submitted to the council detailing embodied carbon reported from a range of projects including all referrable GLA schemes (provided by Arup on behalf of the Westminster Property Association). This data was then reviewed by WCC officers to filter for schemes within authorities within the CAZ area to better reflect development types similar to that within Westminster. To test if this was appropriate, a sense check was done with all schemes presented in the Arup data, not just those within CAZ authorities.

3.2.16 It was found that this gave lower figures of upfront embodied carbon for new buildings and therefore by only testing CAZ authorities, this gave a worst-case scenario. The findings are summarised in Table 3 below. It should be noted that schemes were categorised as being a 'retrofit' if they demolished less than 50% of the existing building. Where no value was entered as a % of building demolition, this was presumed to be nil and categorised accordingly as a retrofit for the purposes of this exercise.

Table 3: Summary of upfront embodied carbon emission statistics taken from Arup data (CAZ authorities, figures excluding sequestration, A1-A5)

Development type	Upfront embodied carbon-commercial	Upfront embodied carbon-residential
Average all schemes	633 kgCO_2e/ sqm	586 kgCO_2e/ sqm
Average new build	755 kgCO_2e/ sqm	648 kgCO_2e/ sqm
Average retrofit	499 kgCO_2e/ sqm	304 kgCO_2e/ sqm

Data on recent projects from Landsec

3.2.17 Additional information was also received by Landsec during the Regulation 19 consultation period which provided information on the performance of seven of their schemes across Westminster, Southwark and the City of London. Further details are shown in Table 4 below.

Table 4: Summary of embodied carbon emission statistics taken from Landsec scheme data

Development type	Upfront embodied carbon-commercial	Upfront embodied carbon-residential
Average all schemes	564 $kgCO_2e$/ sqm	N/A
Average new build	600 $kgCO_2e$/ sqm	N/A
Average retrofit	464 $kgCO_2e$/ sqm	N/A

Future Homes Hub

3.2.18 In addition to the data supplied by Arup and Landsec, industry guidance on embodied carbon was also reviewed. This included the Future Homes Hub, which suggests that for new low-rise housing schemes the median A1-A5 upfront embodied carbon average was 417 $kgCO_2e$/sqm, whereas for new medium/high-rise housing, this was 635 $kgCO_2e$/sqm.

City of London – evidence review of performance of schemes across London

3.2.19 Data was also reviewed from the City of London's '*Refurbishing the City – insights into current best practice*' prepared with consultants Hilson Moran.[22] This considered the upfront embodied carbon A1-A5 for 12 refurbishments, retrofit and deep retrofit commercial schemes. This study highlighted that for the schemes in London, upfront embodied carbon was between 104 $kgCO_2e$/sqm and 700 $kgCO_2e$/sqm. This resulted in an average of 363 $kgCO_2e$/sqm across the schemes presented.

Summary of baseline data

3.2.20 The range of data sources reviewed have been summarised in Table 5 below.

[22] City of London (2024) Refurbishing the City – insights into current best practice. Available from: Refurbishing the City – insights into current best practice (cityoflondon.gov.uk)

Table 5: Summary of baseline data

Data source	Upfront embodied carbon – commercial (kg Co_2e/sqm)	Upfront embodied carbon – residential (kg Co_2e/sqm)
Average all schemes		
WCC planning data	526	584
GLA / Arup data	633	586
Future Homes Hub	N/A	635
City of London / Hilson Moran data	363	N/A
Average new build		
WCC planning data	676	704
GLA / Arup data	755	648
Future Homes Hub	N/A	635
City of London / Hilson Moran data	N/A	N/A
Average retrofit		
WCC planning data	453	223
GLA / Arup data	499	304
Future Homes Hub	N/A	N/A
City of London / Hilson Moran data	363	N/A

Carbon intensity of materials

3.2.21 The data shown in Table 2 to Table 5 above are from planning applications submitted between the years 2016 and 2024. An important factor in reporting embodied carbon is the changing carbon intensity of building materials. The UK Green Building Council[23] have published projections of the carbon intensity of building materials, which show a downward trend from 2018 onwards, as shown in Figure 6 below. Consequently, a comparison of two identical developments from 2018 and 2024 would likely see a reduction in reported carbon emissions, even if using the exact same quantum and type of materials.

[23] UKGBC (2021) Net Zero Whole Life Carbon Roadmap – Technical Report, November 2021. Available from: https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_SPM.pdf

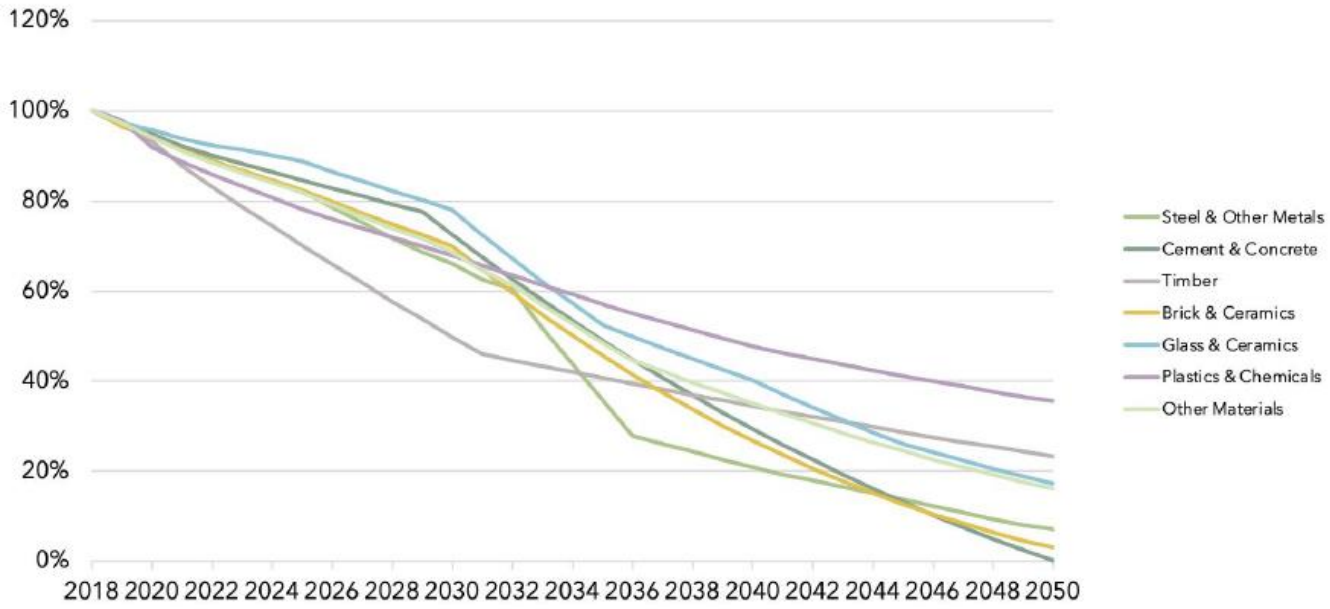


Figure 5: Graph reproduced from UKGBC Technical Report November 2021 demonstrating non-electrical carbon intensity of building materials over time.[23]

3.2.22 It is important to have this trajectory in mind when reviewing current performance, or any models which rely on past building designs. This is for two main reasons, as follows:

- Planning applications submitted to the council, especially major schemes, are unlikely to get to site for at least one to two years, by which time the carbon intensity of materials may have fallen. This means that for some planning applications with whole life carbon data supplied and used within the baselining exercise, this may eventually be less than estimated at the planning application stage.

- Historic data may overstate the amount of carbon associated with a development scheme. This is because the same quantum of materials might have since become less carbon intensive.

RICS Professional Standard methodology

3.2.23 Another important consideration is the methodology used to calculate whole life carbon, which can yield different results depending on which method is used. The approach adopted to date has been the RICS Whole Life Carbon Assessment for the Built Environment – first edition (November 2017). This, however, was superseded in July 2024 with the RICS Whole Life Carbon Assessment for the Built Environment – second edition. There are a number of changes in methodology arising from the release of the second edition of the guidance. This reflects advances in more accurate reporting of carbon emissions associated with construction.

3.2.24 Carbon reported to the council at application stage is also likely to be an estimate of the final upfront embodied carbon cost of a new development. While methodologies often include a buffer, a range of final reported carbon emission changes can occur as a result of different circumstances during the construction phase. In some instances, the carbon calculated at the planning application stage may be overestimated. Due to design efficiencies and achievements in material procurement which might occur during construction phase, this may be reduced when compared to the figures

presented at planning application stage. In other instances, assumptions about material availability could prove to be incorrect, and final carbon numbers can be higher.

3.2.25 Because of this recognised issue, the second edition of the RICS standard encourages that a buffer is included in Whole Life Carbon Assessments at design stage, which was previously not the case when using the first edition of the standard.

Conversion of upfront embodied carbon to present current baseline

3.2.26 For each of the datasets reviewed following the Regulation 19 consultation, the data was analysed to estimate what this performance might be if accounting for the second edition of the RICS standard. This added approximately 15% additional carbon, (representing the estimated uplift which will apply for early-stage designs) to equivalent numbers using the old methodology. Taking the figures reported in Table 2, an example of how the figures have been adjusted are shown in Table 6 below. It is noted that as these figures have not been adjusted to account for materials decarbonisation which might have occurred since 2018, these are likely to be conservative estimates.

Table 6: Example of adjustment of WCC baselining data (figures rounded)

Development type	Upfront embodied carbon – commercial ($kgCO_2e$/ sqm)		Upfront embodied carbon – residential ($kgCO_2e$/ sqm)	
	Raw figures	Adjusting for additional 15% for RICS second edition	Raw figures	Adjusting for additional 15% for RICS second edition
Average all schemes	526	605	584	671
Average new build	676	778	704	809
Average retrofit	453	521	223	256

Establishing baseline figures

3.2.27 Figure 6 and Figure 7 below compare the WCC, Arup, Landsec, Future Homes Hub and City of London data, accounting for the adjustments to carbon for a 15% allowance for the RICS second edition methodology. Figure 6 provides an overview of commercial schemes, while Figure 7 gives an overview of residential schemes.

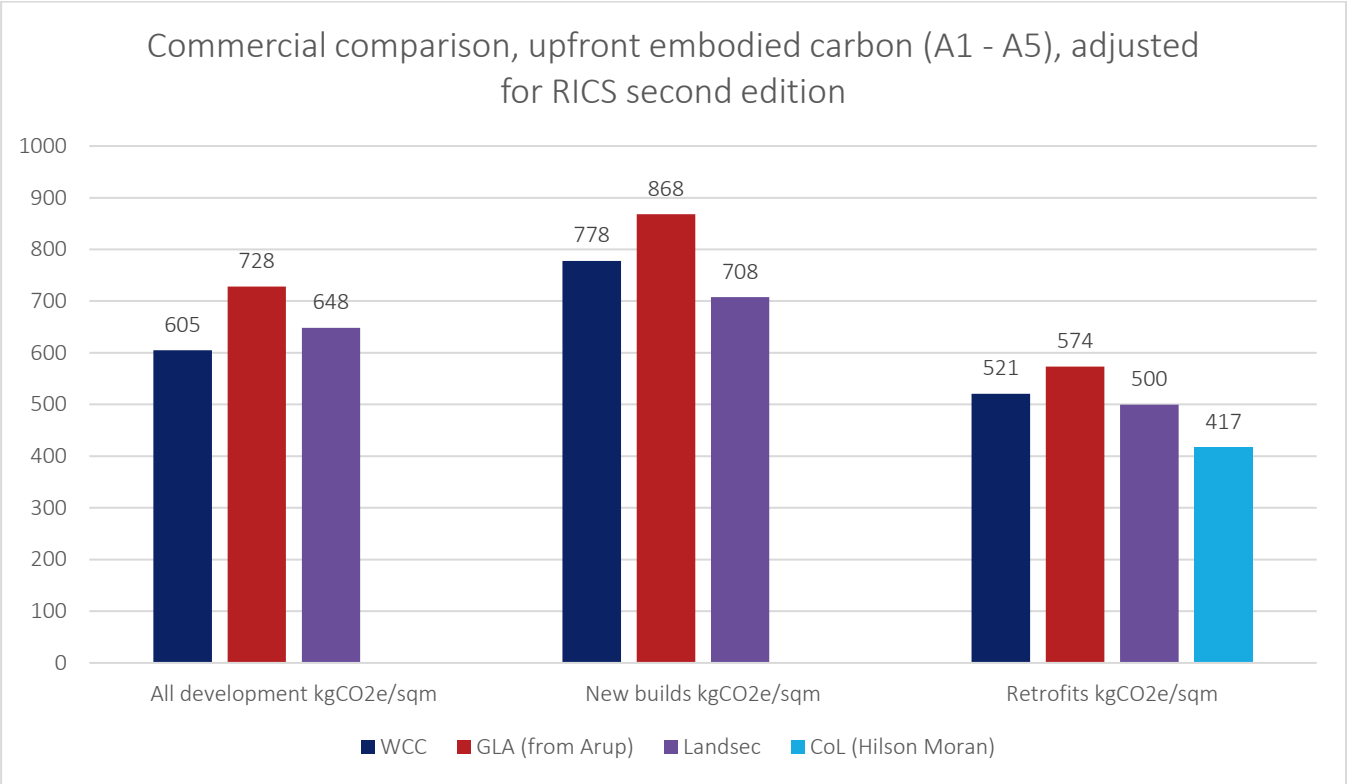


Figure 6: Comparison of average upfront embodied carbon performance from different sources for commercial schemes

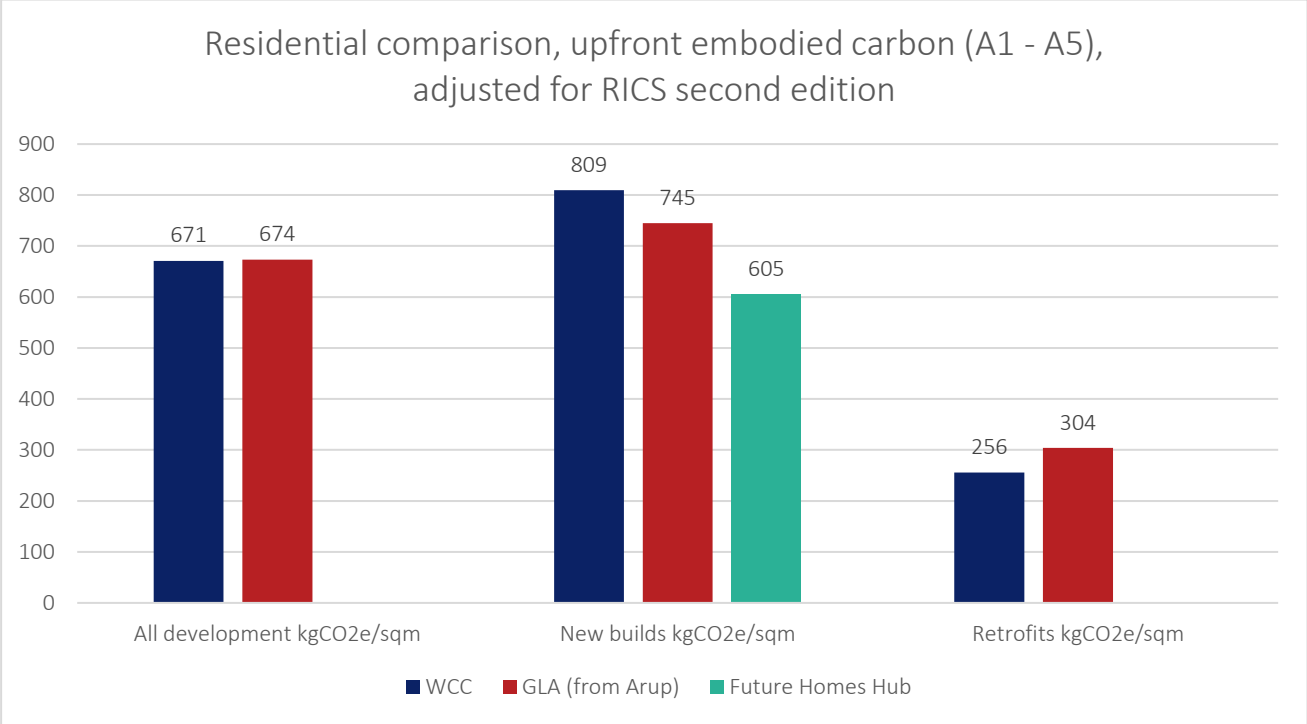


Figure 7: Comparison of average upfront embodied carbon performance from different sources for residential schemes. Note: The figures for Future Homes Hub represent an average between their two residential benchmark figures.

3.2.28 Comparing all figures (adjusted for RICS second edition), the worst-case performance for each category of development as identified in Table 5 is set out in Table 7 below.

Table 7: Upfront embodied carbon factors adjusted for RICS second edition, upper values identified from Table 6

Development type	Upfront embodied carbon – commercial $kgCO_2e$/ sqm	Upfront embodied carbon – residential $kgCO_2e$/ sqm
Average all schemes	728	674
Average new build	868	809
Average retrofit	574	304

London Plan targets

3.2.29 It is recognised that the Mayor of London introduced whole life carbon requirements through the London Plan 2021, as described in Section 3.1 of this Topic Paper. Policy SI 2 of the London Plan, which was consulted on from 2019, is supported by the Whole Life-Cycle Carbon Assessments London Plan Guidance document. This sets benchmarks and aspirational targets for different scheme types, as detailed in Table 8 below.

Table 8: Whole Life Carbon Benchmarks, A1 – A5, London Plan Guidance

Building Typology	Aspirational $kgCO_2e$/sqm	Benchmark $kgCO_2e$/sqm
Offices	600	950
Residential	500	850
Schools, universities etc.	500	750
Retail	550	850

3.2.30 Presuming the figures used by the GLA were from 2019, these figures would have been based on the first edition of the RICS standard. If 15% was added to these figures to make them equivalent to the revised RICS methodology, this would alter the requirements, as detailed in Table 9 below. These have been reviewed alongside the results generated in Table 7 which highlighted the upper value data results from the baseline data.

Table 9: Illustrative London Plan Whole Life Carbon Benchmarks, A1-A5, representing a 15% uplift to reflect changes in RICS methodology [calculated for comparison purposes only]

Building Typology	Aspirational $kgCO_2e$/sqm	Benchmark $kgCO_2e$/sqm	Current practice for new builds (also converted to RICS second edition, see Table 7)
Offices	690	1,093	868
Residential	575	978	809
Schools, universities etc.	575	863	N/A
Retail	633	978	868

3.2.31 The benchmarks identified in Table 9 above, exceed all of the upper values converted to an approximate equivalent for RICS second edition from Table 7.

3.2.32 Therefore, if the use of the London Plan benchmarks were to remain relied upon, this would not result in any changes to the status quo and may in some cases, actually allow development to have greater upfront embodied carbon than what is currently modelled within developments.

Consideration of net-zero targets

3.2.33 Embodied carbon is a global emission source, and so there is no clear reduction trajectory towards net-zero. As such, the council's current Climate Emergency Action Plan to achieve net-zero carbon by 2040 does not currently include Scope 3 emissions, which embodied carbon emissions are considered as.

3.2.34 The UK has committed to a 68% reduction by 2030 of the 1990 levels of emissions, and 100% by 2050. Scope 3 emissions also include many emissions from other nations, and each country have their own targets under the Paris Agreement Framework. While not binding, the Intergovernmental Panel on Climate Change (IPCC) issue regular updates, with the most recent published in 2023[24], on the status of climate change, progress of reductions, and models the future reductions required. This modelling is likely to be the most accurate reduction trajectory for the current baseline emissions rates, as the last IPPC modelling looked at 2019 emissions levels as a baseline.

3.2.35 As no accurate data or forecasting exists for embodied carbon in Westminster, following the same reduction trajectory is the most logical approach as the IPCC trajectory is a global target, and embodied carbon is a globally generally emissions source.

3.2.36 The most recent IPCC assessment report includes a 'summary for policymakers' document which states that: "*all global modelled pathways that limit warming to 1.5°C (>50%) with no or limited overshoot, and those that limit warming to 2°C (>67%), involve rapid and deep and, in most cases, immediate greenhouse gas emissions reductions in all sectors this decade*".[25]

3.2.37 The IPCC have provided a table of the emissions reduction trajectories required, reproduced in Table 10 below.

Table 10: IPCC greenhouse gas and CO_2 emission reductions from 2019[22]

	Reductions from 2019 levels (%), median values [5 – 95 percentile values]				
		2030	2035	2040	2050
Limit warming to 1.5°C	GHG	43 *[34-60]*	*60 [49-77]*	*69 [58-90]*	*84 [73-98]*
	CO_2	*48 [36 -69]*	*65 [50-96]*	*80 [61-109]*	*99 [79-119]*
Limit warming to 2°C	GHG	*21 [1-42]*	*35 [22-55]*	*46 [34-63]*	*64 [53-77]*
	CO_2	*22 [1 – 44]*	*37 [21-59]*	*51 [36-70]*	*73 [55-90]*

[24] Intergovernmental Panel on Climate Change (IPCC) (2023) Sixth Assessment Report. Available from: https://www.ipcc.ch/assessment-report/ar6/

[25] IPCC (2023) Climate Change 2023 Synthesis Report. Summary for Policymakers. Available from: https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_SPM.pdf

3.2.38 The reductions required per year as estimated by the IPCC have been applied to the upper value data baseline figures identified in Table 7. Table 11 shows what the theoretical requirements would need to be to meet the 1.5°C target, along with providing analysis of what the 2°C outcome would look like between now and 2040. This has used the commercial scheme figures to illustrate this issue.

Table 11: Required upfront embodied carbon reductions based on IPCC modelling, commercial scheme figures

Development type	Current baseline from 2024 (see Table 7)	Requirement for 2030	Requirement for 2035	Requirement for 2040
1.5°C target				
Average all schemes	728	484	326	186
Average new build	868	577	389	222
Average retrofit	574	381	257	147
2°C target				
Average all schemes	728	631	510	397
Average new build	868	752	608	473
Average retrofit	574	497	401	312

3.2.39 Figure 8 below takes the data from Table 11 and demonstrates that in order to reduce upfront embodied carbon in line with the IPCC requirements, substantial improvements (i.e. a 74% reduction in current performance) would need to be made between now and 2040, the end of the City Plan period.

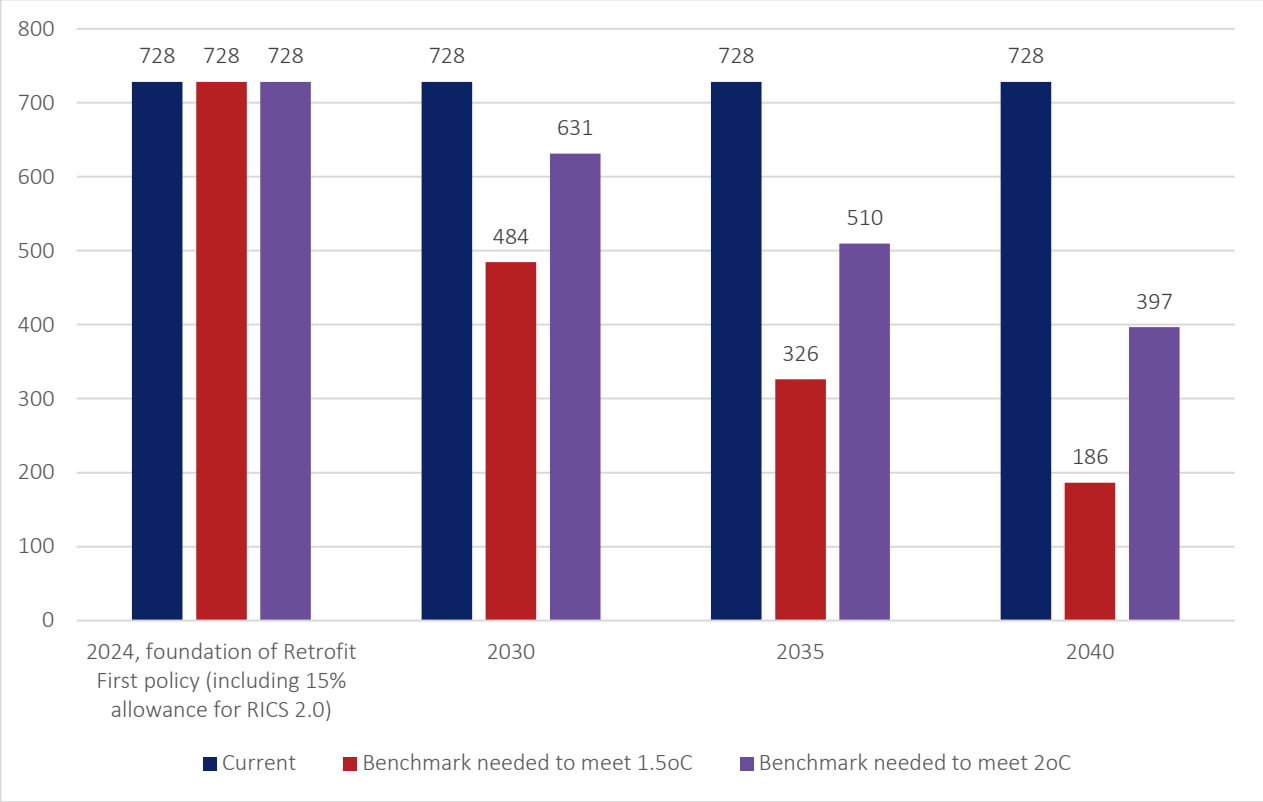


Figure 8: Comparison of current worst-case performance for 'all commercial schemes' identified in Table 7, considering reductions needed to align with IPCC modelling

3.2.40 In reviewing the figures within Table 11 and Figure 8, it is acknowledged that a 2°C global warming trajectory is not something that should be targeted, given it is estimated that this would result in a 42% increase in mortality risk during summer heat extremes.[26] Furthermore, the Paris Agreement, which the UK is a signatory to, is a legally binding international treaty on climate change which entered into force in November 2016. Its overarching goal is to hold "*the increase in the global average temperature to well below 2°C above pre-industrial levels*" and to pursue efforts "*to limit the temperature increase to 1.5°C above pre-industrial levels*."[27]

3.2.41 What this highlights is that upfront embodied carbon emissions will need to continue to decrease over the lifetime of the City Plan, in order to reflect the decreases modelled by the IPCC. Furthermore, this modelling shows that whilst baseline performance relevant to Westminster may currently be below the requirements set by the GLA through the London Plan, a lot more innovation in design and approaches to development need to be considered in order to make further sustained reductions in the future if any positive impact upon global warming were to be achieved.

[26] Huang, Braithwaite, Charlton-Perez, Sarran and Sun (2022) Environmental Research Letters- Non-linear response of temperature-related mortality risk to global warming in England and Wales. Available from: https://iopscience.iop.org/article/10.1088/1748-9326/ac50d5

[27] United Nations Climate Change. The Paris Agreement – What is the Paris Agreement? Available from: https://unfccc.int/process-and-meetings/the-paris-agreement?gad_source=1&gclid=EAIaIQobChMIpov3gdKhiQMVSJNQBh2DxwXvEAAYASAAEgLFqfD_BwE

3.3 Key conclusions

3.3.1 This section has highlighted that there is a current gap in the Development Plan to manage upfront embodied carbon emissions. While some policy to encourage reductions in embodied emissions does exist, this is insufficient to drive the scale of reductions needed to make a positive impact upon carbon emissions.

3.3.2 The baselining exercise has challenges associated with it, due to the fact that there are inconsistent applications of Whole Life Carbon Assessment methodologies. Furthermore, methodologies (such as the RICS standard) have recently been updated. This is coupled with the fact that the UKGBC projects that construction materials will continue to decarbonise. It is also recognised that as the requirement to report upfront embodied carbon emissions is currently mostly voluntary, data relied upon may be skewed towards high performing schemes.

3.3.3 Another key aspect to consider is that where the baseline data has shown the current performance of schemes, to have a beneficial impact upon global warming, this will need to continue to decrease over the lifetime of the City Plan in order to reflect modelling undertaken by the IPCC to limit the effects of climate change. This highlights that significant work is needed to restrict emissions now, but also that these will need to continue to be reduced into the future. This therefore gives impetus to influence the development industry now, particularly as the scale of reductions needed are significant. Whilst Scope 3 emissions may not currently be accounted for within emissions reporting in Westminster, as this section of the Topic Paper highlights, it is reasonable for policy to use levers to influence positive carbon outcomes wherever possible. Planning policy is just one such example.

3.3.4 In summary, the current approach highlights the need for more robust systems around understanding the carbon impacts of development and there is a key role to be played by local planning policy in this matter.

4. Policy Scoping

4.1 Methodology

4.1.1 As has been demonstrated in the preceding sections of this Topic Paper, current practices across Westminster, coupled with the wider legislative and policy context require a greater focus upon the carbon emissions of the built environment.

4.1.2 To understand how a policy within the Westminster City Plan could help to facilitate greater levels of retrofitting and overall reduce upfront embodied carbon from new developments, a series of workstreams were completed by officers. This included research on how retrofitting could be further incentivized, what existing barriers are to retrofitting, and a detailed review of embodied carbon to understand what reasonable requirements could be and how these could be applied to developments across the city. Figure 9 below provides an overview of the policy development methodology.

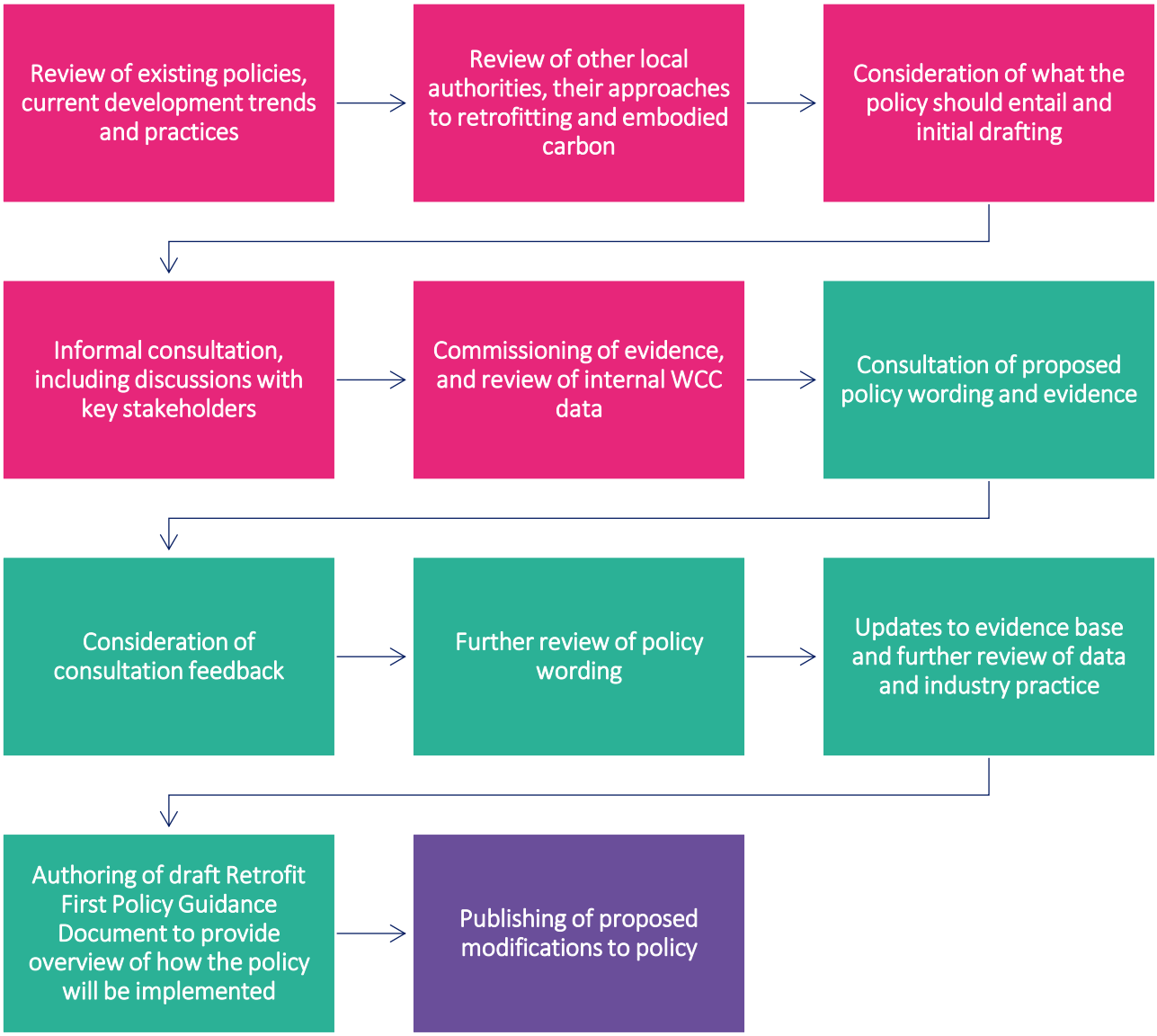


Figure 9: Overview of policy development methodology. In pink: activities undertaken prior to the Regulation 19 consultation. In green: activities following the Regulation 19 consultation

4.1.3 The initial consultation, review of other policy approaches and internal discussions across the council presented a number of options for the policy. This included whether or not the policy should embark on a focus of promoting 'retrofit only' or 'retrofit first' approaches. Similarly, it was reviewed whether the aims of reducing embodied carbon emissions should therefore focus solely on setting embodied carbon benchmarks, rather than prioritising the re-use of existing buildings. As different options were explored, challenges around heritage considerations and the redevelopment of historic buildings were also raised, highlighting the need to review how competing interests might be balanced.

4.1.4 As a result, it became evident that a holistic policy should both promote retrofit and require upfront embodied carbon reductions. Furthermore, given the prominence of historic buildings in Westminster which will be required to meet energy performance requirements and to contribute to the overall reduction in carbon emissions in the city, it became clear that the policy ought to address heritage considerations as well.

4.1.5 Following each of these workstreams, the draft policy was shared with a number of stakeholders in order to further shape and refine the wording. As part of this process, a review of practices undertaken by neighbouring authorities and the GLA was also undertaken to understand how the draft policy would align with similar policies in use elsewhere.

4.1.6 Overall, the development of the Retrofit First policy has sought to reflect the engagement held to date, whilst also balancing the competing interests of the development sector with the climate emergency.

4.2 Review of practices adopted by other London authorities

4.2.1 Following Regulation 18 in 2022, meetings with neighbouring authorities were held as part of the council's Duty to Cooperate requirement. Given the focus of the City Plan Partial Review, this incorporated discussions around the work being undertaken by different authorities with regards to upfront embodied carbon and retrofitting. This helped to provide further insight to the council on things which worked well and where gaps may still exist. In addition to these meetings, regular reviews were undertaken by officers to understand the progress of the different authorities in their relevant policies. This section provides an overview of the current practices evident in other London boroughs. What is evident is that Westminster is not unique across London in the desire to reduce upfront embodied carbon emissions, and that many other boroughs are also considering similar policies and the promotion of retrofit-first approaches.

City of London Corporation

4.2.2 The City of London Corporation submitted its City Plan 2040 to the Secretary of State in August 2024. This new plan, which is, at the time of writing, is subject to examination, incorporates a 'retrofit first' policy which requires that all major developments must undertake an optioneering assessment, in line with the Corporation's Carbon Options Guidance Planning Advice Note[28] and should use this process to establish the most sustainable and suitable approach for the site.

London Borough of Camden

4.2.3 The London Borough of Camden has Policy CC1 in place which requires that "*all proposals that involve substantial demolition to demonstrate that it is not possible to retain and improve the existing building*". The borough has developed planning guidance titled Energy Efficiency and Adaptation[29] (adopted in January 2021) to provide further guidance on how this policy should be applied, including following the sequential approach of:

- Refit
- Refurbish
- Substantial refurbishment and extension, and
- Reclaim and recycle.

4.2.4 Camden's draft local plan (January 2024) contains two policies that seek to strengthen their approach to retrofitting. Policy CC3 requires that retrofit options be fully explored before demolition is approved, but it contains no specific policy tests on demolition – leaving it up to the applicant to justify demolition is the best development outcome for the site. Policy CC4 -

[28] City of London Corporation (2023) Carbon Options Guidance. Available from: https://www.cityoflondon.gov.uk/assets/Services-Environment/carbon-options-guidance-planning-advice-note.pdf
[29] London Borough of Camden (2021) Energy Efficiency and Adaptation. Available from: https://www.camden.gov.uk/documents/20142/4823269/Energy+efficiency+CPG+Jan+2021.pdf/96c4fe9d-d3a4-4067-1030-29689a859887?t=1611732902542

Minimising Carbon Emissions requires that new build residential limit embodied carbon to 500 $kgCO_2e/sqm$ and non-residential 600 $kgCO_2e/sqm$.

London Borough of Ealing

4.2.5 The London Borough of Ealing New Local Plan Regulation 19 consultation ran from February 28 to April 10, 2024. The Plan[30] includes draft policy WLC (Whole Life Carbon Approach) which requires that major developments undertake a Whole Life Carbon assessment and that all major development involving demolition should undertake a carbon optioneering process. This policy is in conjunction with draft policy ECP which sets embodied carbon limits for all major developments. These are separated out by building type and by year of application. Table 12 below shows the embodied carbon targets set by Ealing.

Table 12: Upfront embodied carbon limits proposed by draft policy ECP in the New Ealing Local Plan

	Up to 2030	After 2030
Residential	<500 $kgCO_2e/sqm$	<300 $kgCO_2e/sqm$
Office	<600 $kgCO_2e/sqm$	<350 $kgCO_2e/sqm$
Education	<500 $kgCO_2e/sqm$	<300 $kgCO_2e/sqm$
Retail	<550 $kgCO_2e/sqm$	<300 $kgCO_2e/sqm$

London Borough of Enfield

4.2.6 The London Borough of Enfield submitted their Local Plan to the Secretary of State in August 2024, following their Regulation 19 consultation which ran between March and May 2024. This version of their Local Plan[31] includes draft Policy SE3: Whole-Life Carbon and Circular Economy. This requires all major development to prepare a Circular Economy Statement and to prioritise the reuse and retrofit of existing buildings wherever possible. As part of this policy, major development proposals are required to calculate their whole-life carbon impacts with the aim of meeting specified upfront embodied carbon targets. Like Ealing, Enfield have adopted two separate targets: one for applications received up to 2030 and one for applications received after this date. Prior to 2030, domestic major schemes would need to be below 500 $kgCO_2e/sqm$ and non-domestic below 600 $kgCO_2e/sqm$. For applications after 2030, this decreases to below 300 $kgCO_2e/sqm$ for domestic schemes and below 350 $kgCO_2e/sqm$ for non-domestic.

London Borough of Harrow

4.2.7 The London Borough of Harrow launched their Regulation 19 public consultation on November 4, 2024, for the new Local Plan.[32] This plan includes Policy CN1, which focuses on Sustainable Design and Retrofitting. Under this policy, all new buildings must achieve Net Zero Carbon in operation and be constructed with low levels of embodied carbon. Additionally, the policy encourages and

[30] London Borough of Ealing (2024) The Local Plan – Development Management Policies. Regulation 19 version. Available from: https://www.ealing.gov.uk/download/downloads/id/19563/3_chapter_5_development_management_policies_high_res.pdf
[31] London Borough of Enfield (2024) Enfield Draft Local Plan Regulation 19 March 2024. Available from: https://www.enfield.gov.uk/__data/assets/pdf_file/0030/55668/ELP-REG19-Consult-Chapters-3-15-Planning.pdf
[32] London Borough of Harrow (2024) Harrow's New Local Plan 2021-2041: Initial Proposals (Regulation 18). Available from: https://www.harrow.gov.uk/downloads/file/32095/New_Harrow_Local_Plan___Reg_18_final_agreed_version__for_web_.pdf

supports the sustainable conversion and retrofitting of existing buildings to enhance energy efficiency and improve the quality of living for occupants. Major residential, non-residential, and mixed-use refurbishment proposals are required to achieve certified 'Excellent' ratings in relevant BREEAM refurbishment schemes, unless it is demonstrated to be unfeasible.

Royal Borough of Kensington & Chelsea

4.2.8 The Royal Borough of Kensington & Chelsea adopted their new Local Plan in July 2024.[33] The plan has a policy that promotes sustainable retrofitting (Policy GB1), a policy on Circular Economy (Policy GB2) and a policy on Whole-Life Carbon (Policy GB3). These policies support sensitive retrofitting whilst requiring that all major developments prepare a Circular Economy Statement in line with the London Plan requirements. Furthermore, all major development applications will be requested to provide whole-life carbon assessments which demonstrate actions taken to reduce whole-life carbon emissions.

Royal Borough of Kingston upon Thames

4.2.9 The Royal Borough of Kingston upon Thames concluded its Regulation 18 public consultation on February 28, 2023, for their new Local Plan. The draft Strategic Policy KC1 aims to ensure the efficient use of resources and minimise embodied carbon throughout the lifecycle of developments.

4.2.10 Draft Policy KC7 outlines several key requirements for major development proposals which includes the requirement to calculate whole life-cycle carbon emissions in accordance with London Plan requirements and demonstrate actions taken to reduce these emissions.

London Borough of Newham

4.2.11 The London Borough of Newham's Local Plan, currently at Regulation 19 status,[34] includes Policy CE3 on Embodied Carbon and the Circular Economy. This policy mandates that major developments submit a Circular Economy Statement and conduct a Whole Life Carbon assessment, with an expectation to meet embodied carbon limits of less than 500 $kgCO_2e/sqm$.

4.2.12 Policy CE5 focuses on enabling suitable retrofit schemes that do not require planning permission. It strongly encourages applicants to undertake positive retrofit actions when other development is occurring. Additionally, applicants should consider the circular economy in their retrofit measures, using high-quality materials and ensuring the future flexibility and adaptability of buildings.

London Borough of Wandsworth

4.2.13 The Wandsworth Local Plan 2023-2038, adopted in July 2023,[35] emphasises the potential for retrofitting and improving the performance of all buildings, including historic ones. It highlights opportunities to enhance the energy efficiency of heritage buildings through measures like

[33] Royal Borough of Kensington and Chelsea (2024) New Local Plan. Available from: https://www.rbkc.gov.uk/planning-and-building-control/planning-policy/local-plan

[34] London Borough of Newham (2024) Our Newham Local Plan: Draft Submission Local Plan (Regulation 19) June 2024. Available from: https://www.newham.gov.uk/downloads/file/7728/local-plan-2024-web-part-1-

[35] Wandsworth Council (2023) Wandsworth Local Plan 2023-2038: Adopted July 2023. Available from: https://www.wandsworth.gov.uk/media/large/adopted_local_plan.pdf

improved insulation and draught-proofing, alongside the application of energy-generating technologies.

4.2.14 Applicants for major developments are required to prepare a Whole Life-Cycle Carbon Assessment, adhering to the Mayor of London's guidance on Whole Life-Cycle Carbon Assessments. Retrofitting is seen as a significant opportunity to meet carbon emission reduction targets, with a focus on the sensitivity of existing developments, particularly heritage buildings, to achieve higher standards of energy and water efficiency.

Summary

4.2.15 The approaches taken by other authorities across London are summarised in Table 13 below. It is recognised that for many of these authorities, as they are at Regulation 18 or 19 stage of their Local Plan development, the data in this table may be subject to change. However, Table 13 is helpful in demonstrating the differences in approaches across London.

Table 13: Overview of requirements of London authorities with retrofitting and/or embodied carbon policies

	Explicit requirement for an options assessment to demonstrate construction options?	Whole Life Carbon Assessment required?	Upfront embodied carbon targets – commercial*	Upfront embodied carbon targets – residential*
City of London	Yes	Yes	No targets	No targets
Camden	Yes	Yes, major developments	500kg CO_2e/sqm	600kg CO_2e/sqm
Ealing	Yes	Yes, major developments	600kg CO_2e/sqm (office) 550kg CO_2e/sqm (retail)	500kg CO_2e/sqm
Enfield	Yes	Yes, major developments	600kg CO_2e/sqm	500kg CO_2e/sqm
Harrow	No	No	No targets	No targets
Kensington & Chelsea	No	Yes, major developments	No targets	No targets
Kingston upon Thames	No	Yes, major developments	No targets	No targets
Newham	No	Yes, major developments	500kg CO_2e/sqm	500kg CO_2e/sqm
Wandsworth	No	Yes, major developments	No targets	No targets

**Where targets are given until 2030, and post 2030 – this table shows the 'until 2030' figures*

4.2.16 What is evident from Table 13 is that a number of authorities now have either emerging or adopted policies on this matter. Furthermore, it is clear that the majority require all major developments to prepare a Whole Life Carbon Assessment, therefore extending the London Plan requirement, to not be applicable to just referrable schemes. Whilst an assessment is consistently required, it is noted that not all authorities require specific embodied carbon targets. For those that do, all targets range between 500kg CO_2e/sqm to 600kg CO_2e/sqm.

4.2.17 Taken together, the actions of other authorities across London, along with Westminster, show the growing prominence of this issue and the use of planning policy to help to address it.

4.3 Collaborative policy scoping

Initial stakeholder engagement

4.3.1 The council consulted on the initial scope of the City Plan Partial Review (Regulation 18) between the 7th of October and 18th of November 2022.

4.3.2 The Regulation 18 consultation received responses from a range of consultees including residents, community groups, the development industry and statutory stakeholders. The main themes of the consultation responses are summarised as follows:

- There was overarching support for a policy that promotes retrofitting and achieves net zero carbon.
- The case was made that the policy should allow for demolition (or deconstruction) under certain cases, as not every building might be suitable for retrofitting, there might be larger carbon savings in the long term, or there may be competing policy objectives.
- It was suggested that the policy should follow a sequential approach, and should set out clear benchmarks, requirements and tests.
- The policy provides an opportunity for data collection and incorporating a new monitoring indicator.
- Alignment with the London Plan policies on Whole Life Cycle Carbon and Circular Economy was requested.
- It was highlighted that the policy should work for both historic and more modern buildings, and for different sizes and typologies.
- Wider benefits to retrofitting beyond carbon were highlighted that the policy should take consider such as greening, air quality and flood risk.

4.3.3 Once the draft policy wording was completed, informal engagement with a number of key stakeholders was undertaken. Given that the new policy would be a step-change from current practice, the council thought it would be important to incorporate initial feedback to help to further shape the direction of travel for the policy prior to formal consultation. This phase of engagement was carried out from October to December 2023 and included a number of groups, as elaborated on in further detail below.

Westminster Retrofit Taskforce

4.3.4 Established in 2022, the Westminster Retrofit Taskforce[36] is comprised of council officers, external stakeholders and three independent industry experts. The Retrofit Taskforce was created to address the practical challenges of retrofitting vast building stocks, including heritage buildings, in Westminster. Following its inception, the taskforce developed an early delivery plan with workstreams aimed at addressing the identified barriers to retrofit and the upscaling of delivery across the city. This incorporated a review of the emerging planning policy, which was presented to the Taskforce for comment in October 2023.

[36] Westminster City Council (2023) Retrofit Taskforce. Available from: https://www.westminster.gov.uk/planning-building-control-and-environmental-regulations/planning-and-climate-emergency/retrofit-taskforce

4.3.5 Initial feedback highlighted the need to robustly define what is meant by key terms such as 'retrofit', 'substantial demolition' and 'responsible retrofit' with suggestions provided by the Taskforce. Members of the Taskforce also provided comments on the draft policy wording and how the policy should be set out.

Westminster City Council's services

4.3.6 In addition to consultation with the Taskforce, a number of internal sessions were held with teams across the council to discuss the policy. At various sessions over October and November 2023 this included representatives from the following internal teams:

- Planning Policy
- Town Planning
- Design, Conservation and Sustainability
- Climate Emergency
- Housing
- Development
- Economy

4.3.7 The feedback provided from this engagement helped to refine the wording of the draft policy. This included a review of how options appraisal tests might work in practice, with examples given by council colleagues of scenarios which might require more flexibility in the policy approach. A number of discussions were also held around the balancing of heritage, design and environmental considerations and how this might work in practice through the implementation of the draft policy.

4.3.8 Another key discussion point focussed on the delivery of affordable housing and how schemes such as estate regeneration programmes delivering above policy-compliant levels of affordable housing might be dealt with through this policy. This discussion led to the inclusion of wording which allowed flexibility for fast-track affordable housing schemes.

Historic England

4.3.9 Historic England attended one of the sessions with the Retrofit Taskforce and was also asked for comments on the draft policy wording.

4.3.10 Overall, Historic England have been supportive of a policy that seeks to retain existing buildings over demolition. Points were raised however around the need to deal with heritage and retrofit matters separately in the policy wording and to incorporate some form of monitoring to ensure that a one size fits all approach, which might lead to maladaptation of historic buildings, does not eventuate.

4.3.11 Comments from Historic England also raised concerns with the specific reference to extensions and the reasons why this particular type of development had been singled out. It was suggested that further clarity be provided around the notion of what an extension that enables wider retrofit entails.

Westminster Property Association

4.3.12 The Westminster Property Association (WPA) have published a number of documents which support their stance that developments should consider retrofit first, not retrofit only. This includes

'Zero Carbon Westminster: A Focus on Retrofit in Historic Buildings'[37] and 'Retrofit First, Not Retrofit Only'[38] in collaboration with the London Property Alliance.

4.3.13 Draft versions of the policy were shared with the WPA and WCC planning policy officers attending the November 2023 meeting of the WPA's Planning Sustainability Group. Members of the WPA were then also invited to an in-person industry workshop hosted by WCC in November 2023, along with an online webinar for WPA members in December 2023.

4.3.14 Feedback was provided through discussions at these events and attendees were invited to email any comments on the draft policy wording.

4.3.15 During the meetings and workshops held with the WPA, a number of concerns were raised:

- Commercial implications
  - Ability of the policy to support the development of exemplar office spaces which support high-value jobs across Westminster.
  - Rental yields associated with retrofitted buildings.
  - Investment available for retrofitted buildings.
  - Financial viability of retrofitting schemes.
- Introduction of whole-life carbon targets
  - Concerns over the adoption of LETI and RIBA targets in policy wording.
  - Concerns over the inaccuracies of whole-life carbon assessments and the assumptions used to inform these assessments.
  - Concerns around the expertise required to prepare and consider whole-life carbon assessments (from both the point of view of applicants and council officers).
- How building regulation requirements (namely around accessibility and fire safety) can be addressed through retrofit options.
- How key terms such as 'retrofit' and 'demolition' are defined in the policy.
- Availability of low carbon building materials and bespoke materials required to sensitively refurbish heritage buildings.
- The ability of the retrofit policy to enable best use of land on underutilised sites.
- The use of terminology such as 'exceptional circumstances' and 'absolute minimum' within the policy wording.

4.3.16 Some of these concerns were reiterated in the WPAs response to the council's draft policy, prior to the commencement of the Regulation 19 consultation period.[39]

[37] Westminster Property Association (2021) Zero Carbon Westminster: A Focus on Retrofit in Historic Buildings. Available from: https://www.westminsterpropertyassociation.com/zero-carbon-westminster-a-focus-on-retrofit-in-historic-buildings/

[38] London Property Alliance (2022) Retrofit First, Not Retrofit Only: A focus on the retrofit and redevelopment of 20th century buildings. Available from: https://www.londonpropertyalliance.com/retrofit-first-not-retrofit-only-a-focus-on-the-retrofit-and-redevelopment-of-20th-century-buildings/

[39] Westminster Property Alliance (2023) Response to Westminster City Council's draft Retrofit Policy. Available from: https://www.westminsterpropertyassociation.com/response-to-westminster-city-councils-informal-consultation-draft-retrofit-policy/

Industry workshop

4.3.17 A workshop was held in November 2023 with representatives from architecture practices, engineering firms, construction contractors, developers, sustainability professions, planning firms and landowners. This also included members from the WPA, as mentioned above.

4.3.18 The workshop was held in-person and provided context around the need for a retrofit and embodied carbon policy, how the policy had developed and insights into the three parts of the policy included in the draft wording. Attendees were invited to take part in smaller group discussions, guided by a series of questions relevant to each part of the draft wording. Given the range of experiences in the room, the discussions were balanced between attendees who were either very supportive of the policy or those who had opposing views. Feedback received from the workshop was collated by officers and used to inform further amends to the draft policy wording.

Regulation 19 webinars, presentations and local drop-in sessions

4.3.19 During the Regulation 19 consultation period from March to May 2024, a number of briefing sessions were organised to enhance the understanding of the Retrofit First policy and to assist residents and organisations interested in preparing a response in clarifying any queries they might have. This included a dedicated webinar on the Retrofit First policy, along with an in-person presentation to the WPA and its members. Two drop-in sessions were also held in the north and south of the city for local residents to attend. Officers involved in the drafting of the Retrofit First policy were in attendance to take any questions on the policy.

Representations received during the Regulation 19 consultation

4.3.20 A number of representations were received with regards to the Retrofit First policy during the Regulation 19 consultation. Details of these representations are submitted as evidence to the City Plan Partial Review. In addition to this, the submission version Consultation Statement[40] provides responses to some of the key issues raised in the representations received during this period.

Summary

4.3.21 Overall, the informal engagement activities prior to the Regulation 19 consultation proved useful for the council in order to inform the drafting of the policy. The iterative process sought views from varied stakeholders, many with differing views on how a policy seeking to reduce embodied carbon emissions and demolition might work in practice.

4.3.22 Following the formal Regulation 19 consultation, the review of feedback from stakeholders informed the final refinement of the policy. The proposed modifications have sought to balance the wide range in practical matters raised to ensure that the policy is robust and able to be implemented alongside others in the Development Plan. This included consideration of matters such as growth targets, to ensure that the city could still promote the principles of sustainable growth.

4.3.23 To coincide with the proposed modifications following the Regulation 19 consultation, a Retrofit First Policy Guidance Document[41] has been prepared to give further clarity on how the policy will

[40] See CORE_014 Submission Consultation Statement

[41] See EV_R_004 Retrofit First Policy Guidance for Environment SPD

be implemented once adopted, which will form the basis of a Supplementary Planning Document (SPD) once the Retrofit First policy is adopted. This will likely become part of the existing Environment SPD, however pending the outcomes of the Examination in Public, the council are also open to the document becoming its own standalone SPD if appropriate.

4.4 Definitions

City Plan Glossary

4.4.1 To improve the implementation of the Retrofit First policy, and to understand its scope and how it will apply to development proposals, modifications are proposed to the City Plan glossary. These are intended to make the terminology used in the policy clearer. The definitions are intended to ensure the draft policy as far as possible encourages the retention of as much fabric as practical.

4.4.2 Figure 10 below shows the hierarchy intended to be referred to for preferential development types, with definitions provided in further detail in Table 14 below. Further details on how the policy applies to different development types is included within the Retrofit First Policy Guidance Document for the Environment SPD.[41] This explains that in most cases, new buildings will result in 'substantial demolition'. Therefore, where the policy requires an assessment on the basis of the scheme proposing substantial demolition, this will be as a result of a new building being proposed.

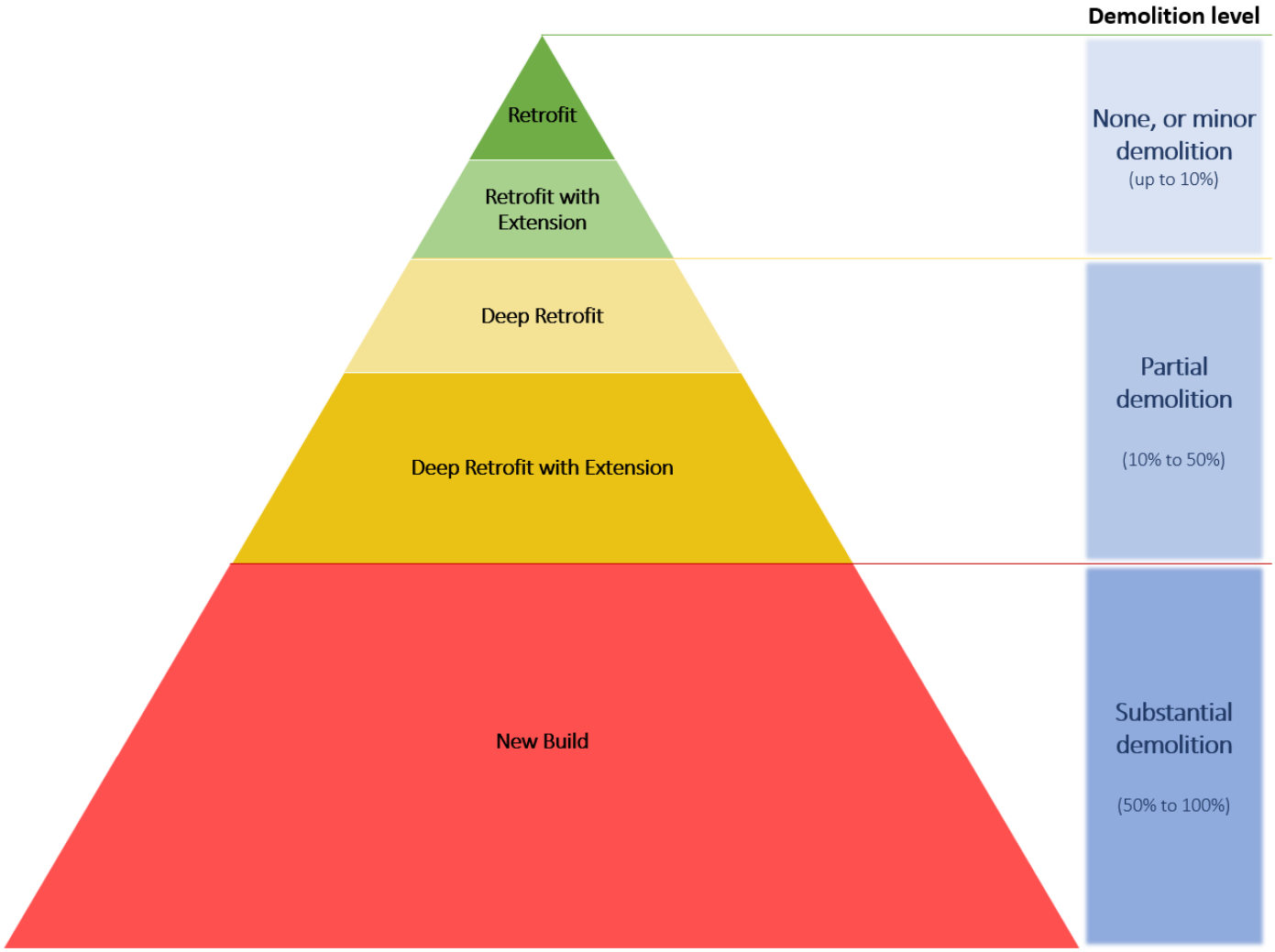


Figure 10: Circular Economy hierarchy, demonstrating the preferential treatment of retrofit developments

Table 14: Proposed definitions for inclusion within the City Plan

Term	Proposed definition in City Plan glossary
Retrofit	Development which involves measures to facilitate energy, performance and climate adaptation upgrades. For the purposes of the Retrofit First policy, this could include the removal and replacement of building envelope, services and finishes and may involve none or minor works to the superstructure of the existing building(s) (including foundations, core, and floor slabs) resulting in less than 10% of the existing building(s) being subject to demolition.
Deep retrofit	Development involving the re-use of as much of the existing building(s) as possible and which involves measures to facilitate energy, performance and climate adaptation upgrades. For the purposes of the Retrofit First policy, this could include the removal and replacement of building envelope, services and finishes and may involve works to the superstructure of the existing building(s), involving the demolition and replacement of less than, or equal to 50% of the existing floor slabs.
New building	For the purposes of the Retrofit First policy, development which involves the demolition and replacement of more than 50% of the floor slabs and substructure of any pre-existing building over a single storey, or entirely new structures.
Substantial demolition	Demolition of more than 50% of the floor slabs and substructure of any pre-existing building.
Responsible retrofit	Responsible retrofitting is an informed and integrated attitude to retrofit in a way that enables people to reduce the operational carbon of a building, improve energy efficiency, and/or improve a building's resilience to the impacts of climate change. Responsible retrofit will take into account the building's location, context, design, construction, materials and use, to ensure retrofit measures perform well and avoid adverse impacts to health, heritage and the natural environment.
Embodied carbon	The carbon emissions emitted producing a building's materials, their transport and installation on site as well as their disposal at end of life.
Operational emissions	The greenhouse gas emissions arising from all energy consumed by a building in use, over its life cycle once construction is completed.

5. Policy development

5.1 Principles of the policy

5.1.1 It is well understood that in order to reduce upfront embodied carbon emissions, that different approaches need to be utilised. As demonstrated in Figure 11 below, the most effective way to reduce carbon emissions is to either 'build nothing' or 'build less'.

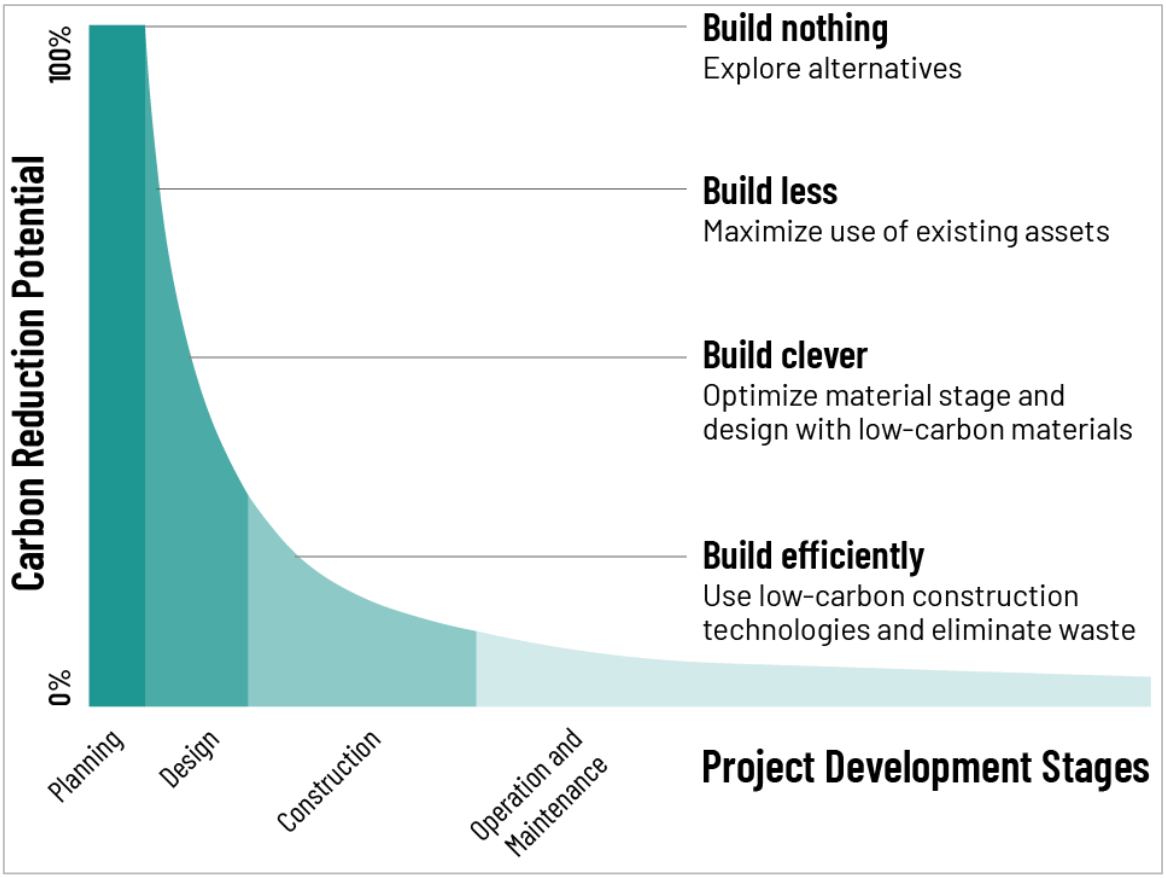


Figure 11: Opportunities to reduce embodied carbon from stage of design process. Reproduced from World Green Building Council[42]

5.1.2 Figure 11 therefore effectively demonstrates the basis of a 'retrofit first' approach to carbon reduction. This shows that by putting an emphasis on planning and design matters which can encourage either building nothing, or building less, embodied carbon emissions can be most effectively optimised. Whilst building in a more innovative way (i.e. 'build clever' and 'build efficiently') can still reduce embodied carbon emissions, maximising the use of existing assets has a clear benefit.

5.1.3 Through the development of the policy and the engagement undertaken, it became apparent that the council's position on retrofitting needed to be abundantly clear within the policy. In light of this, three key principles of the policy were established and included as introductory text within the proposed modifications to the policy following the Regulation 19 consultation.

[42] World Green Building Council (2019) Bringing embodied carbon upfront. Coordinated action for the building and construction sector to tackle embodied carbon. Available from: https://worldgbc.s3.eu-west-2.amazonaws.com/wp-content/uploads/2022/09/22123951/WorldGBC_Bringing_Embodied_Carbon_Upfront.pdf

These key principles were incorporated within the Regulation 19 draft policy; however, it was evident through the consultation responses received that the policy could be improved by making these key priorities clearer. In response, the council re-phrased existing text and reframed the introduction section of the policy to make intentions clear and to reduce misinterpretation. The key principles are as follows:

- All development will minimise embodied carbon emissions and support the circular economy, through the adoption of a retrofit first approach.
- Proposals involving responsible retrofitting, which result in extended lifespans of existing buildings, and energy, performance, and climate adaptation upgrades, will be supported in principle.
- Proposals should prioritise uses and/or development options (such as retrofitting or deep retrofitting) which facilitate the retention and repurposing of existing building(s).

5.1.4 The first key principle was included in the policy wording to highlight that the approach to considering retrofitting first should be the starting point for all development across the city. This creates consistency in approach and overall seeks to ensure that where there may be opportunities to reduce materials usage and support the circular economy, that this is considered.

5.1.5 The second key principle was highlighted to draw connections between the policy and the Historic England definition of 'responsible retrofitting'. The inclusion of this text now as key principle makes clear that the council do not simply want the retrofitting of existing buildings at any cost, but rather the adoption of an approach which promotes high-quality outcomes. This should consider how the retrofitting intervention can enhance the lifespan of existing buildings, and how this will also ensure that these buildings become more efficient and able to adapt to changing needs and climate. This is a key priority for the council who wish to see the rich historic fabric of Westminster maintained and actively used for generations to come.

5.1.6 The third key principle was included to highlight the influence of early decision-making in whether retrofitting approaches can be adopted. If new uses are proposed for existing buildings which result in significant construction work being required (which may also include substantial demolition), then thought should first be given to whether other uses (suitable in that building and/or location, as per the Development Plan) could be accommodated within an existing building, leading to greater retention. Considering uses which retain a greater proportion of existing buildings are part of the overarching retrofit first approach, as this reviews what is possible in the realms of the existing building first, before continuing with other development options.

5.2 Sequential tests for demolition

5.2.1 The current City Plan approach requires developers to explore options for the re-use of buildings but falls short of setting out clear policy tests to regulate the approach to when demolition is acceptable. The only other policies which relate to demolition are design and heritage related, rather than specifically related to climate change.

5.2.2 Replacing buildings is still a key mechanism for achieving sustainable development, particularly where structures have reached their natural end of life or are made redundant due to changes in the requirements of urban economies. At the same time, there is economic pressure to replace buildings as financial returns from new buildings are traditionally often seen to be more reliable for owners when compared to schemes which include greater building retention.

5.2.3 Any prospective policy must therefore balance the competing needs of building owners to generate value from their assets, the practicable and societal need to replace some buildings, and the carbon impacts of construction activity. To achieve this, the council propose to set out a series of policy tests to reduce the demolition rate, while ensuring the necessary process of building replacement can continue to a modulated degree. The adopted policies relating to heritage, design and demolition would all continue to apply.

5.2.4 Whilst retrofitting is identified as a key measure to reduce embodied carbon emissions, it is recognised that there are a multitude of constraints unique to individual buildings and settings which can determine the appropriateness of this in certain circumstances. There may also be scenarios where due to the limitations of what can be achieved through retrofit or deep retrofit approaches, demolition needs to occur to deliver on priorities for the city. This could take many forms and may include public infrastructure or delivering on the council's spatial strategy, across Housing Renewal Areas in particular.

5.2.5 The introduction of a sequential tests emerged in recognition of this need for evidence informing planning decisions; give flexibility in choosing development options, whilst still providing fair certainty to applicants. Furthermore, the tests were introduced as a means to help ensure that other objectives of the council to drive public benefits (including Fairer Westminster Strategy targets and adopted City Plan policies) could still be achieved, rather than adopting a blanket approach to retrofitting and demolition.

5.2.6 The intention of the policy is to ensure that an appraisal exercise is undertaken to demonstrate what the outcomes may be if a building is proposed for substantial demolition. By demonstrating compliance with the sequential tests through the preparation of a Pre-Redevelopment Audit, this can assist decision makers in understanding what is possible for development schemes, what is feasible at these sites, and what the relative carbon cost can be if substantial demolition is undertaken.

5.2.7 Whilst tests need to be conducted in a specific sequence, not every scheme involving substantial demolition would be required to complete all of them.

What development should be subject to the sequential tests

5.2.8 The sequential tests are devised to be completed by any development scheme which proposes substantial demolition of a building greater than a single storey. This therefore means that the tests would apply to both major and minor applications, if substantial demolition is proposed. The decision to include minor applications is based on the fact that the overwhelming majority of planning applications granted in Westminster over the last five years have been minor applications, as demonstrated in Table 15 below.

Table 15: Westminster planning applications data, granted schemes Q3 2019 to Q2 2024 (MHCLG)[43]

	Number	Proportion
Major	155	*1.8%*
Minor	8,616	*98.2%*
Total	8,771	*100%*

5.2.9 The sequential tests were introduced in the policy to ensure that the council could holistically understand the reasonings behind the need for substantial demolition, to be satisfied that all options possible for retaining the building had been reviewed. In this way, the sequential tests help the council to understand the trade-offs between retaining buildings, the carbon impacts of substantial demolition and other benefits which might be achieved. This can then inform decision-making on the development and its compliance with the Retrofit First policy.

5.2.10 It is important to note that the sequential tests only apply to schemes proposing substantial demolition (as usually the most carbon intensive option) to ensure that deep retrofits, which may require some form of demolition in order to retrofit the building, are not subject to the same policy tests and should remain encouraged.

5.2.11 Similarly, where an existing building proposed for substantial demolition is not taller than a single storey, these development schemes have been excluded and will not be required to meet the sequential tests. This decision was made to not create overly onerous restrictions on landowners (including householders) for structures such as single storey garages or outbuildings. Across Westminster there are a limited number of single-storey dwellings which this policy could apply to, and it is recognised that single storey structures tend to have lower embodied carbon due to not requiring extensive reinforcement and load bearing as is the case in buildings with multiple storeys. For this reason, their exclusion was seen to be reasonable.

5.2.12 A summary graphic of the sequential tests is shown in the figure below. Demonstration of meeting the sequential test is to be shown through a Pre-Redevelopment Audit. Further information on the contents of the Pre-Redevelopment Audit is provided within the Retrofit First Policy Guidance Document.[41]

[43] Department for Levelling Up, Housing and Communities (2023) Live tables on planning application statistics. Available from: https://www.gov.uk/government/statistical-data-sets/live-tables-on-planning-application-statistics

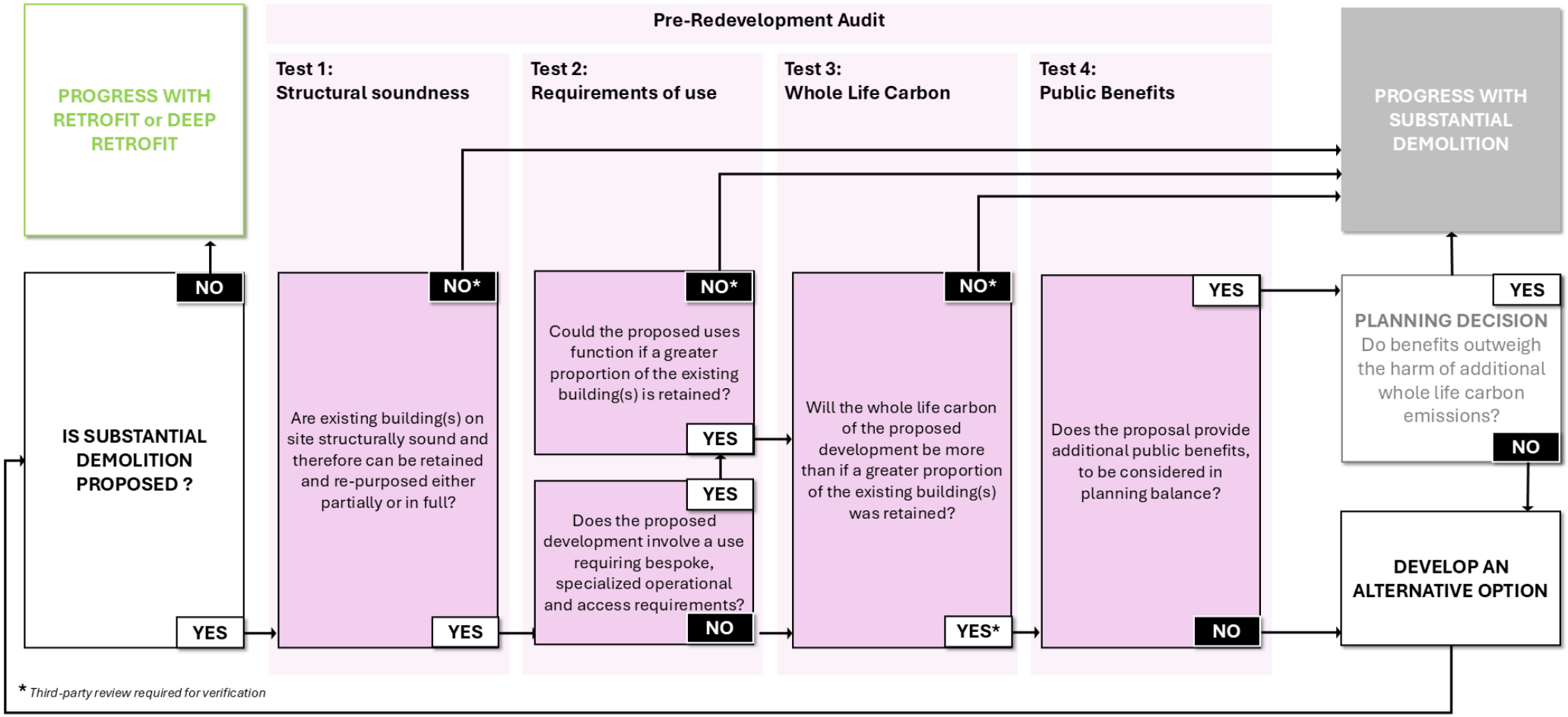


Figure 12: The operation of sequential tests

Sequential tests for substantial demolition

5.2.13 As shown in Figure 12, the test was developed to consider the following:

- Structural constraints
- Operational and access requirements
- Overall carbon associated with the development
- Delivery of public benefits

5.2.14 These tests, along with consideration of their order are elaborated on in further detail below. It should be noted that as is demonstrated in Figure 12, not all tests will need to be completed by all development proposals. Proposals should follow the tests sequentially, and where evidence is able to satisfy a particular test, then no further tests are required to be met.

5.2.15 Further detail included below should be read in conjunction with the Retrofit First Policy Guidance Document.[41]

Test 1: Structural constraints

5.2.16 It is recognised that structural concerns may impede the feasibility of a retrofit. This could be true for a range of different buildings for a multitude of reasons. As such, where it can be verified by a structural engineer that the existing building cannot be retained either partially or in full, substantial demolition may be acceptable. This test was introduced to assist in ensuring that buildings which are unsound do not remain as stranded assets, but rather can be redeveloped for other uses which will continue to benefit the city and make the best use of land. Placing this as the first test is also useful in establishing what is actually possible/feasible on sites first, rather than considering alternative development options which would not be possible for structural and/or safety reasons.

Test 2: Requirements of use

5.2.17 As buildings are usually designed with specific uses in mind, the repurposing of these to adapt to bespoke needs can restrict certain future uses. For example, multi-storey car parks throughout Westminster were originally designed for vehicle parking. The requirements for these structures make them difficult to be retrofitted to other uses. As such, it may be appropriate in some circumstances that substantial demolition is allowed at these sites. This may also apply to sensitive uses, such as healthcare, where it can be demonstrated that bespoke design features are required, and which could not be achieved through a retrofit or deep retrofit option.

5.2.18 This test was introduced into the policy wording in order to continue to promote the types of land uses and redevelopment opportunities the city seeks to prioritise. Including this test as the second within the sequential test ordering was done in order to give a greater understanding to decision makers of what is feasible when considering the existing building and the proposed use for the development. Where it may be that there are no bespoke operational or access requirements associated with a proposed development, then this test may be skipped, and applicants should proceed to the third policy test.

Test 3: Considering the carbon associated with different development options

5.2.19 In some instances, the amount of whole life carbon associated with a development option which retains more of an existing building may be more than what could be achieved through an option which involves substantial demolition This test was introduced in order to restrict the occurrence of perverse outcomes which could contradict the overarching aims of the policy, for example, where proposals to reduce operational emissions in-use, lead to very high upfront embodied carbon emissions. The ordering of the test is so that what is feasible structurally, along with what can occur to accommodate the proposed use, is understood first. In this case, the council did not want unrealistic and undeliverable development options to be compared to in whole life carbon terms. This means that a Whole Life Carbon Assessment comparison undertaken by applicants will be robust and better able to demonstrate potential impacts in carbon terms with different deliverable development options.

Test 4: Delivery of public benefits

5.2.20 As was discussed above, it was recognised that there will be some instances where a development scheme which has the potential to deliver public benefits may not be able to deliver these to the same extent through a deep retrofit or retrofit solution. The introduction of this test recognises that there are other priorities of the council, including ambitions set out within the City Plan and London Plan, which may require a flexible approach in considering restrictions on demolition.

5.2.21 The introduction of the public benefit test recognises that applicants will be encouraged to provide public benefits regardless of whether a development is a retrofit, deep retrofit or a new build and that in order to be compliant with other policies within the Development Plan, this will be a given in any case. However, this test seeks to identify the scale of net additional public benefits beyond policy requirements, and how this compares with the additional carbon demonstrated to be emitted in the findings of the Carbon Options Appraisal undertaken as part of test 3. This can help decision makers understand how the public benefits should be balanced against the expenditure of carbon demonstrated in a comparable development scheme(s), as identified through the sequential test.

5.3 The need for upfront embodied carbon requirements

5.3.1 The need to reduce upfront embodied carbon from development was explored in the opening sections of this paper. However, it is challenging to forecast what development may come forward across the city, and what the pipeline of development will look like for the remainder of the City Plan period to 2040. Furthermore, as the city evolves and changes through the plan period, additional infrastructure requirements could cause large increases in embodied carbon. It was therefore considered more appropriate at this time to use individual upfront embodied carbon requirements for development, rather than setting an overarching carbon budget for Westminster.

5.3.2 Reviewing the current trends in development as demonstrated in Section 3.2, it is apparent that on the whole, retrofits offer upfront embodied carbon savings compared to new buildings. The potential savings depend upon the extent of the retrofit, with deeper and more extensive retrofits utilising more materials and so have higher upfront embodied carbon associated with them, reflecting the well-recognised correlation between the amount of materials re-used in-situ and lower upfront embodied carbon. It is also understood that the use of secondary raw materials enhances the circular economy, lowering the demand for material extraction, and therefore is considered a climate change mitigation measure, promoting resilience locally, as well as globally.[44]

5.3.3 It is acknowledged that there will be an increase in upfront embodied carbon emissions associated with domestic retrofits resulting from council's push for a fabric first approach, renewable and low-carbon technologies and decarbonisation programmes. As some domestic works do not require planning permission, updated embodied carbon data and scope of those works cannot be fully captured. It therefore becomes crucial that some limits are considered for other, larger scale development types. To achieve this, upfront embodied carbon requirements should be suitably challenging that developers consider the retention of existing building(s) first, but still enable high quality low carbon new buildings where appropriate.

Use of Whole Life Carbon Assessments

5.3.4 Through the London Plan and existing City Plan policies on sustainable design, Whole Life Carbon Assessments have become increasingly used to understand the carbon impacts of buildings at the planning application stage. Whole Life Carbon Assessments are useful because they can holistically show the overarching impact of a development scheme, considering not just the carbon emissions which may occur from the operation of the building.

5.3.5 For this reason, it was considered appropriate that a consistent requirement for Whole Life Carbon Assessments was introduced in the Retrofit First policy. Within Whole Life Carbon Assessments, more can be understood about the role of different building components and how these contribute to the overall carbon impacts of the development. As was discussed in Section

[44] Global Resources Outlook (2019) Natural Resources for the Future We Want, International Resource Panel, United Nations

2 of this Topic Paper, as per the RICS second edition methodology, Whole Life Carbon considers the elements shown in Figure 1 on page 10.

5.3.6 As is shown in Figure 1, the different building elements are extensive. For some elements, these are already covered by existing policies within the Development Plan (such as operational energy requirements). The main gap, and one which is able to be influenced by planning policy, is upfront embodied carbon. Whilst other sources of embodied carbon are important to consider, the nature of the English planning system is such that applications come forward for discrete development activity, rather than for individual buildings over their lifetime. For this reason, the ability to influence in-use and end of life embodied carbon is limited. Therefore, emerging planning policy will focus on upfront embodied carbon emissions.

Why include embodied carbon requirements

5.3.7 As has been established in the preceding sections of this Topic Paper, the decision-making processes within the planning system contribute to largescale emissions, which planning policy could have a significant impact upon. Whilst Scope 3 emissions are not currently regulated, or included within local authority emissions reporting, it is not irrational to introduce measures to reduce these emissions. Incorporating mechanisms to consider retrofitting first is one way to encourage more retention of existing building(s) and the resultant reduction in upfront embodied carbon emissions associated with reusing carbon intensive construction materials. However, where new buildings are justified through the sequential tests, these new developments should still use less carbon wherever possible.

5.3.8 Another important reason to set upfront embodied carbon requirements is to ensure that decisions being made from the outset in the design of a building factor in whole life carbon. Key decisions around whether to retain or demolish an existing building, layouts and end uses of developments can have a major impact on the overall emissions of a proposal, which can also have an impact on the future emissions of a building too. This may include operational emissions, but also the future adaptability of a building to respond to changing needs over its lifetime.

What building elements requirements should apply to

5.3.9 As was discussed in Section 2 of the Topic Paper, whilst it is key that the whole life carbon of buildings is understood and reduced, it is the upfront embodied carbon which is becoming an increasingly critical element.

5.3.10 It was therefore considered that all major applications, and any applications which involve substantial demolition should complete a Whole Life Carbon Assessment. While Whole Life Carbon Assessments would be required to understand the impacts of the building across its lifetime, it is the upfront embodied carbon element within these assessments which can be better controlled at planning application stage, namely as they occur prior to occupation and are heavily influenced by design decisions which are made and considered during a planning application. Furthermore, it is a source of carbon emissions which is emitted in a shorter, more acute time period, rather than across a prolonged period of time. For this reason, it makes the most sense that any policy focus on requirements for upfront embodied carbon emissions, rather than a figure for the whole life carbon emissions.

5.3.11 When considering the RICS Standard second edition methodology, as is replicated in Figure 13 below, requirements within planning policy are likely to be most effective when considering modules A1 to A5, as highlighted in red.

5.3.12 Within these A1 to A5 modules, there also needs to be consideration as to which building components can be reasonably controlled through the planning system. One key example is fit-out in office buildings. From a planning perspective, it is possible to control the development of what is referred to as shell and core (for example, lobbies, lift shafts, structural elements) and Cat A fit-out (for example, lighting, air conditioning, toilets). Cat B fit-out includes items which tenants would likely procure themselves once they are occupying an office. This may include things such as office furniture, partition walls and specialist lighting (such as feature lights and lamps). Whilst Cat B fit out is considered as a component of the whole life carbon of the building, and indeed does include embodied carbon, the type of furniture used in a building is not something controlled by planning. As such, it was not reasonable for any potential upfront embodied carbon requirements to include Cat B.

5.3.13 A similar consideration was for external works which could include, for example, public realm improvements. Whilst this would also include upfront embodied carbon, not all development schemes would include external works and for those that do, the scale of this can vary significantly. Furthermore, this scale is something which planning cannot control. Therefore, for consistency across building types, external works were excluded from the requirements.

5.3.14 Similarly, depending on the nature of the development, it is not possible for the planning process to control any demolition which has previously occurred on a site (i.e. not part of the planning application where permission for works is being sought). Furthermore, planning cannot control the existing state of a site, which means that the original building which may be subject to demolition can vary significantly. However, it is recognised that in the RICS second edition methodology, previous demolition on sites is considered as part of a Whole Life Carbon Assessment. Therefore, whilst this should be considered within the Whole Life Carbon Assessment to be submitted to Westminster, it was not considered reasonable to incorporate demolition within the upfront embodied carbon requirements set by the policy. Similarly for this reason, facilitating works are also excluded.

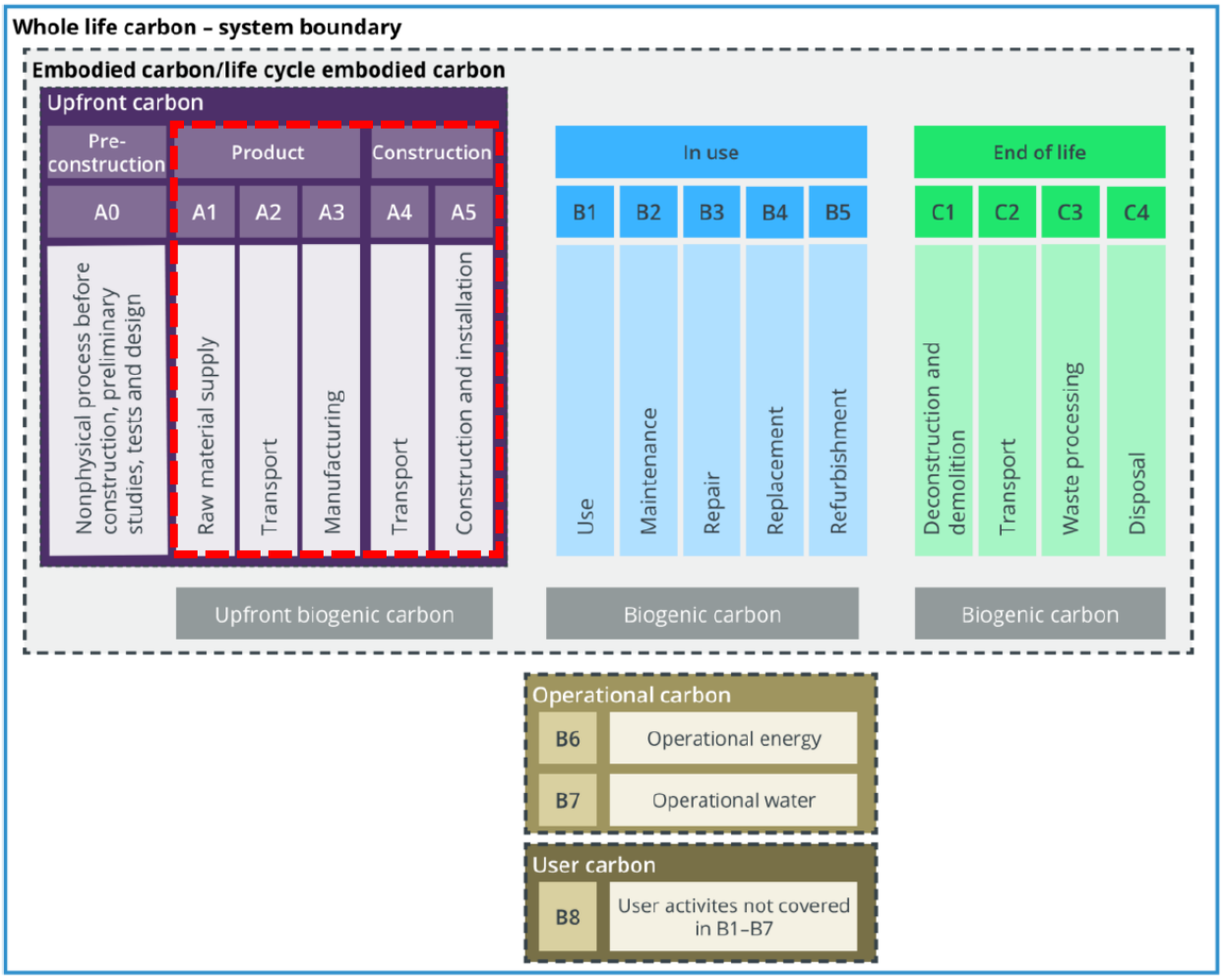


Figure 13: Overview of A1 – A5 modules, as part of the whole life carbon system. Red dash denotes area of focus for requirements at the planning application stage

5.3.15 Another key point for consideration is what project stage requirements should apply to. Considering again the question of what decisions at the planning application stage can influence, it is recognised that any requirements should be for the construction phase of a development. It is clear that due to the nature and/or timing of construction activity, this can result in changes from the point at which planning permission is granted. This may include things such as procurement processes and material availability which may not be known until construction commences. This will mean that compliance with the requirements will need to be monitored through planning conditions in order to accurately reflect whether a development is adhering to policy.

5.4 Westminster's approach to upfront embodied carbon requirements

Requirements used in the Regulation 19 version of the policy

5.4.1 The Regulation 19 version of the Retrofit First policy included upfront embodied carbon targets. These were based on bandings established by the Low Energy Transformation Initiative (LETI). The use of LETI bands were considered appropriate at the time of writing the policy, given that the organisation was an industry leader in reducing embodied carbon emissions from the built environment sector. Whilst the LETI standards were voluntary, the metrics used were widely understood by the industry and WCC felt that for these reasons it would be beneficial to link the emerging policy with this standard.

5.4.2 During the Regulation 19 consultation however, a number of concerns were raised about the appropriateness of using the LETI bandings. This was highlighted by both supporters and objectors to the policy. A number of concerns related to the reliance on a third-party organisation, which could change that standard at any time and would therefore mean that there would not be consultation on these changes by virtue of being part of Westminster's Development Plan.

5.4.3 Concerns were also raised about the achievability of the LETI bandings specified in the policy. This related to the data upon which the LETI bandings were established, along with how changes in industry practices, including assessment methodology had been reflected in the bandings.

5.4.4 Other concerns were raised about the longevity of the LETI standard. It was highlighted that an emerging, national standard was being drafted, which the LETI organisation was a key part of. Referred to as the UK Net Zero Carbon Building Standard (UKNZCBS), the Standard was being devised to create a robust and consistent approach to assessing, verifying and certifying buildings.

5.4.5 Given the scale and remit of the UKNZCBS and the involvement of LETI in its development, the LETI standard may be retired, with developers encouraged to instead focus on the UKNZCBS. If this were to be the case, the references to the LETI bandings in the City Plan could be problematic if they ceased to exist.

Quantitative requirements for Westminster

5.4.6 The feedback from the Regulation 19 consultation, and the council's own investigations led to the conclusion that quantitative upfront embodied carbon requirements set within the policy text specific to Westminster would be more appropriate. However, as there is no UK-wide approach which could be readily adopted by Westminster to inform the Retrofit First policy at this time, further work was undertaken.

5.4.7 The council decided to develop quantitative embodied carbon requirements based on the principles that they should:

- Be founded on the existing standard RICS Professional Standard 2nd Edition.

- Be reflective of lessons learned through other performance standards and guidance published by organisations such as LETI and RIBA, along with being cognisant of the emerging UKNZCBS.
- Not be a relaxation of other requirements of the Development Plan (for example, the Whole Life Carbon Benchmarks set for schemes referrable to the Mayor of London by the GLA).
- Use evidence available from internal and external sources on current upfront embodied carbon performance.
- Cover matters which town planning can control within its statutory powers.
- Be tested to understand the feasibility of their implementation and any other impacts these could have on development (such as financial viability).

5.4.8 The process undertaken to revise the upfront embodied carbon requirements within the policy are summarised in Figure 14 below.

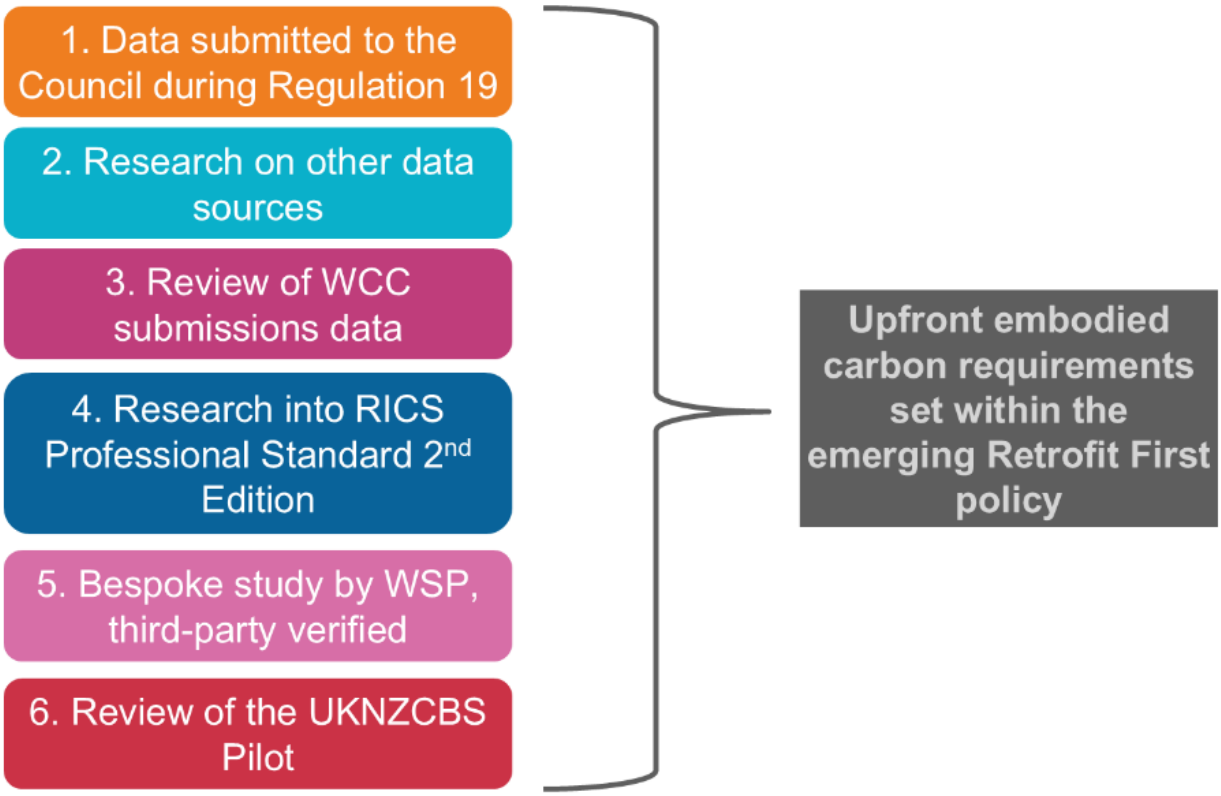


Figure 14: Information used to establish upfront embodied carbon requirements within the Retrofit First policy

5.4.9 Items one to four, as shown in Figure 14 were reviewed in detail in Section 3 of this Topic Paper. This exercise effectively created a baseline to understand existing practices and the current performance of buildings both within Westminster and across London. Building upon this baseline, further reviews were undertaken. This included the commissioning of a bespoke evidence paper which analysed typical buildings in Westminster and what could be possible, using the latest RICS methodology, to reduce upfront embodied carbon emissions. To ensure robustness of this report and to gather additional industry insights, this paper was third-party reviewed.

5.4.10 In addition to this evidence, a review was also undertaken of the UKNZCBS. The pilot for the Standard was released in September 2024, and as the emerging national, standardised approach to reducing whole life carbon in the built environment, it was pertinent to understand the approach taken in the Standard.

Consideration of baselining data

5.4.11 In Section 3, an estimate was given of the scale of carbon emissions which have been associated with development across Westminster.

5.4.12 It should be remembered that there are some flaws with using historic data, given that assessments completed over the last few years have typically underestimated calculations relating to facades and building services. This can mean that the data relied upon to generate estimates is not entirely accurate, and that this, coupled with changes to methodology arising from the RICS second edition standard means that current baselines will continue to alter as industry practices change. This reinforces the need for streamlined data collection on this matter (such as through the implementation of upfront embodied carbon requirements and subsequent reporting) to shed some light on this matter and what is actually occurring across the city.

5.4.13 A summary of the findings of the baseline exercise are included in Table 5 on page 31, which provides an overview of what level of performance is occurring in the absence of any mandatory whole life carbon requirements for all developments across the city.

5.4.14 As was discussed in Section 3 of the Topic Paper, while the London Plan currently sets carbon benchmarks, including for upfront embodied carbon, it is felt that through industry advancements, changes in assessment methodology and availability of enhanced baseline data, these can be improved upon to devise Westminster specific requirements. As is shown in Table 5 on page 31, current performance remains below the benchmarks suggested within the London Plan Guidance.

5.4.15 The results of the existing baseline data, coupled with the political and local community appetite to be ambitious in pushing for further carbon reductions across the city has led the council to consider upfront embodied carbon requirements lower than those suggested by the London Plan Guidance. In doing so, it is hoped that the scale of emissions derived from upfront embodied carbon will continue to be reduced, helping to foster a more sustainable built environment industry.

WSP Embodied Carbon Evidence Study

5.4.16 Achieving sustainable development also means ensuring that other tenets of sustainability are met, including social and economic. This means that when setting requirements for development, consideration must be given as to whether a requirement could be too challenging, and therefore potentially restrict positive social or economic outcomes. To analyse realistic requirements, the council commissioned an evidence paper to look at what reductions in upfront embodied carbon could be achieved with current construction practices, and how this might impact on the capital costs associated with new development.

5.4.17 An initial report[45] was prepared by WSP to support the Regulation 19 consultation for the emerging Retrofit First policy. This was inspired by a similar report, also completed by WSP, for the West of

[45] See EV_R_002 Embodied Carbon Evidence Base

England Combined Authority which formed part of their evidence base for the development of a policy which also sought to limit embodied carbon.

5.4.18 Representations received during the consultation highlighted a number of areas that the report could expand upon. As such, a revised report was prepared by WSP.[46] The main changes in this report compared to the previous version included updates to reflect the RICS second edition methodology, additional building typologies typical of Westminster, and revised assumptions with regards to building components.

5.4.19 The report established baseline designs for four building typologies, as follows:

- Large office: 7 storeys, 10,368 sqm
- Mixed-use: 7 storeys, 10,368 sqm
- Residential: 8 storeys, 8,064 sqm
- Small office: 3 storeys, 1,440 sqm

5.4.20 From these baseline designs, various decarbonisation strategies were applied and assessed to estimate the magnitude of upfront embodied carbon reductions achievable within current construction practices. Alongside this, the study examined the capital costs associated with each intervention to estimate the financial impact of each carbon reduction measure. Alternative scenarios included the following:

- Low Carbon Façade
- Low Carbon Finishes
- Low Carbon MEP
- Reduced Grid Spacing
- Low Carbon Concrete
- Low Carbon Steel (+ 50% Cement Replacement for Residential Typology)
- Hybrid Timber

5.4.21 The study identified that across the four typologies, when the interventions listed above were applied cumulatively, carbon savings of between 22 to 26% could be achieved within a 1 to 4% cost uplift.

5.4.22 The upfront embodied carbon baselines, compared to the reduced carbon scenarios are summarised in Table 16 below.

[46] See EV_R_003 Embodied Carbon Evidence Base Update

Table 16: Review of findings from the WSP Embodied Carbon Evidence Study Update

Typology	Baseline* [kg CO_2e/sqm]	Baseline* (without basement) [kg CO_2e/sqm]	Low Carbon Scenario* [kg CO_2e/sqm]	Cost uplift	Cost uplift (excluding savings)
Large office	802	746	579	-1.5%	+1.9%
Mixed use	781	716	583	-2.4%	+1.3%
Residential	893	875	685	-0.7%	+4.1%
Small office	1,115	789	849	+1.7%	+3.5%
**A1 – A5, excluding demolition, facilitating and external works*					

5.4.23 Differences between building typologies are evident in Table 16, reflecting the fact that different building requirements can result in significant differences with regards to upfront embodied carbon.

5.4.24 One of the starkest differences between the typologies is the relative impact of basements. In the small office typology, the inclusion of a basement increases the baseline scenario by around 41%. This reinforces the message that basements constitute significant upfront embodied carbon emissions and where they are allowed[47], this must understand the relative carbon impact of this type of development and balanced accordingly. If all typologies were to proceed without basements, it is evident (not just in the case of small office buildings) that there would be considerable emission savings. This could be through a design which does not include a basement and/or one which re-uses a substructure of an existing building, rather than creating a new basement.

5.4.25 Another consideration evident through the results of the WSP study is the differences in what is achievable for residential developments. The study concluded that, mostly due to the updated façade methodologies and restrictions on the use of timber, achieving low embodied carbon in residential developments can be more challenging. It is therefore likely that for residential buildings below 18 metres (where timber can be used more widely due to fire safety considerations), development should be possible to achieve lower upfront embodied carbon results.

5.4.26 The WSP study also reviewed the build cost impacts of achieving lower carbon new buildings. It was found that due to the fact that lower carbon outcomes could result in the use of less construction materials, and/or cheaper materials (due to being recycled or byproducts of other waste processes), that build costs could decrease. As is shown in Table 16 above, where the cost savings were accounted for, build costs decreased for all typologies with the exception of small offices. Where cost savings were not accounted for (thereby presuming conservative estimates), the build cost uplift for the four building typologies could range from 1.3% to 4.1%.

5.4.27 The impacts to build cost identified within the WSP study were used by BNP Paribas in their assessment of viability impacts of the emerging Retrofit First policy. As is stated within the Viability

[47] In line with adopted City Plan Policy 45 – Basement Developments

Study Addendum – October 2024[48], it was found that this would not have a significant impact upon development viability and in some instances, where the carbon scenarios involving cost savings were assumed, this could improve development viability outcomes.

Third-party review of the Embodied Carbon Evidence Study

5.4.28 Another key update following the Regulation 19 consultation was the commissioning of a third-party review of the WSP Embodied Carbon Evidence Study. The nature of the work being completed by WSP was novel and received extensive feedback during the Regulation 19 consultation. To bolster the evidence, an update was commissioned, alongside a review by technical experts to provide additional advice and industry learnings and to give comfort to the council, and later the Planning Inspectorate, of the methodology used.

5.4.29 The third-party review was completed by sustainability consultants at Max Fordham, with dedicated reviewers also being suitably qualified structural engineers with subject matter expertise on low carbon buildings.

5.4.30 The third-party review was an iterative process which was conducted alongside the preparation of the WSP Evidence Base. The findings of the review by Max Fordham are included within this Topic Paper at Appendix 1. As is shown in Appendix 1, Max Fordham found that the methodology and assumptions used by WSP in undertaking the study were appropriate for the scale and nature of the report they were commissioned for. Given the complexities of this topic area, the review also highlights future work areas which could be considered if a similar study with a broader scope and less time pressures were to be commissioned by another organisation in the future.

Limits of the Embodied Carbon Evidence Study

5.4.31 Given the nature of the analysis undertaken, there are some limitations to the study. These are largely attributed to the scope of the study which, through additional resources, could be expanded upon in the future.

5.4.32 Testing interventions based on simplified building typologies can lack the nuance usually found in individual buildings. This may be due to site-specific constraints (such as ground conditions), and/or other restrictions arising from Westminster's Development Plan. Combined, these mean that empirical studies can be considered as oversimplifications. However, it is clear that a study like this is needed to provide context to emerging policies and whilst it may be simplistic, it is a well-informed starting point to demonstrate current construction practices and potential impacts.

5.4.33 Another limitation of the evidence is that it reviews what current construction practices are, in the context of existing Building Regulations and market availability in the UK of particular construction products. While the policy is being developed for the City Plan which is looking forward to 2040, it is possible that the introduction of new technologies and the use of different cement replacements, recycled materials and timber may become more widely adopted and/or available at scale. However, the scope of the WSP study was to review current practices and to understand the starting position for the policy. It is therefore important that any future policy and related upfront embodied carbon requirements remain under review to ensure that they are fit for purpose over the lifetime of the City Plan.

[48] See EV_GEN_003 Viability Study Addendum (October 2024)

5.4.34 Another limitation of the study is that by reviewing current industry practices, the study has not taken into account other design interventions and innovative construction methods which could also have a significant impact upon upfront embodied carbon. Whilst some design interventions were identified by WSP in their report, as is articulated by Max Fordham's review in Appendix 1, there may be other ways to make designs more efficient and thus further reduce upfront embodied carbon emissions. Whilst some of these went beyond the scope of WSP's report, they are useful context in understanding wider industry challenges and the methodology shift required to deliver genuinely low carbon development. In light of this, Max Fordham produced a series of 'Gateway Decisions' to further highlight to building designers areas which could be considered from a design perspective in the first instance which require less materials, prior to investigating low-carbon material substitutions.

5.4.35 Notwithstanding the limitations of the Embodied Carbon Evidence Study, the scope of the study was to provide a starting point for understanding what could be possible in Westminster to achieve low carbon development and what impact this could have on capital costs associated with new buildings. Through this study and the review provided by Max Fordham, a deeper understanding of industry practices, construction methodologies, materials availability and carbon impacts has been established. With further time and financial resources, the scope of this study could be broadened further. It is highly recommended that this study scope is indeed expanded upon by others across the UK to develop what would no doubt be invaluable insights. For this reason, the council intends to submit all evidence gathered in the course this City Plan Partial Review to the GLA and to actively support the preparation of the new London Plan and any further London wide planning guidance on the matter of whole life carbon emissions.

Review of the UK Net Zero Carbon Building Standard

5.4.36 The UK Net Zero Carbon Building Standard (UKNZCBS) was created collaboratively by built environment organisations and leading experts in the profession in response to industry demands for a clear and unified definition for net zero carbon aligned buildings in the UK. Organisations involved in the development of the UKNZCBS include:

- Better Buildings Partnership (BBP)
- Building Research Establishment (BRE)
- Chartered Institution of Building Services Engineers (CIBSE)
- The Carbon Trust
- The Institution of Structural Engineers (IStructE)
- Low Energy Transformation Initiative (LETI)
- Royal Institute of British Architects (RIBA)
- Royal Institute of Chartered Surveyors (RICS)
- UK Green Building Council (UKGBC)

5.4.37 The Pilot version of the Standard was published in September 2024. This document contains technical details on what a building needs to achieve, the technical evidence needed, and how this evidence needs to be demonstrated and reported to be deemed a 'net-zero carbon' building in whole life carbon terms. The introduction of the Pilot version of the Standard marked a major

milestone for organisations and individuals involved in the assessment of whole life carbon of the built environment in the UK.

5.4.38 As relevant to the emerging Retrofit First policy, the Standard includes upfront embodied carbon limits for a range of building typologies. There are two different limits for each building typology, depending on whether the development scheme is considered to be a 'new building' or a 'retrofit'. Aligning the Standard with the UK's net-zero ambitions, the limits for building typologies change year on year from 2025 to 2050.

5.4.39 The introduction of the Standard will simplify the methodologies to be used and performance requirements across the UK. For this reason, the council are supportive of the UKNZCBS and its ambitions. However, the launch of the Pilot version highlights three main issues relevant to Westminster's emerging Retrofit First policy. This includes the following:

- As has been discussed elsewhere in this Topic Paper, the Regulation 19 version of the policy included reference to upfront embodied carbon requirements established by LETI. Through LETI's involvement with the UKNZCBS, it is anticipated that once adopted, the UKNZCBS would supersede the LETI bands. This gives further impetus to the council to make updates to the Regulation 19 version of the Retrofit First policy to ensure the policy remains implementable in the event that LETI bandings cease to remain in-use.
- Whilst the council is supportive of the UKNZCBS, the timelines associated with the City Plan Partial Review mean that the adopted Standard will not be available in time as it is currently due to be adopted in late 2025. For this reason, the LETI bandings cannot be simply substituted with UKNZCBS embodied carbon limits, as these are part of the Pilot document and are therefore subject to further consultation and review over the coming months.
- Finally, the UKNZCBS as drafted is currently a Standard for completed buildings. Therefore, its appropriateness at this time to be used within planning policy to determine planning applications is not suitable.

5.4.40 Notwithstanding the fact that the UKNZCBS cannot be used by Westminster at this time, it is still important to review the emerging embodied carbon limits within the Standard as the first of its kind in the UK, which has been informed by extensive data and technical review. These are detailed in Table 17 below.

Table 17: Review of relevant upfront embodied carbon limits established by the UKNZCBS

Building type	2025 limits	2040 limits
Commercial Residential	580	185
Offices – Whole Building	735	235
Offices – Shell and Core	475	150
Retail	715	225
Homes – Single family	430	125
Homes – Flats	565	160
Hotel	670	215

5.4.41 Further analysis of the UKNZCBS and how this differs from an approach to be adopted by Westminster has been provided in Appendix 2. It is noted that whilst these differences may currently exist, any future reviews of the Retrofit First policy, including the Full Review of the City Plan scheduled for 2025 would take into account the Standard and any opportunities to better align.

Summary of findings

5.4.42 Table 18 below summarises the data collated across the workstreams identified in this section of the Topic Paper. Where different numerical values are provided for different years, these have focussed on those set for 2025. Furthermore, this data has compared numbers just for 'new buildings' as it is anticipated that any upfront embodied carbon requirements would be more easily met by buildings which retain existing building(s) proposing either retrofit or deep retrofit measures.

Table 18: Summary of embodied carbon workstreams review, A1-A5 comparisons

	Upper value of baseline study[a]	WSP low carbon development option[b]	Emerging UKNZCBS limit
Offices	868	579	615[c]
Retail	868	583[d]	715[e]
Homes – single family	N/A	N/A	430
Homes – flats	809	685	565
Hotel	809	N/A	670

a) As taken from Table 7

b) This figure reflects what would be controlled through planning policy, i.e. A1 – A5, excluding demolition, facilitating and external works. Therefore, direct comparisons cannot be made with these numbers, but have been included to illustrate scale.

c) The UKNZCBS figure for 'Offices – Shell and Core' is 475kgCO_2e/sqm. Estimation for Cat A (based on WSP report) is between 120 – 140 kgCO_2e/sqm. Adding 140kgCO_2e/sqm to the 'Shell and Core' UKNZCBS figure would arrive at around 615 kgCO_2e/sqm

d) 'Mixed use' figure adopted here from WSP report, given likely type of retail development in Westminster

e) The retail typologies reviewed by the UKNZCBS reflect a different type of retail typology usually found in Westminster. For example, retail parks are likely to be large single storey buildings, compared to retail in Westminster which might occupy the ground floor of a mixed-use building alongside other uses.

5.4.43 What is clear in Table 18 is that the worst-case baseline values identified in Section 3 of the Topic Paper are significantly higher than the figures emerging from the WSP study, and the UKNZCBS. Whilst these numbers may be representative of slightly different scopes (for example, WSP figures are A1-A5 excluding demolition, facilitating and external works) and the figures represent different study outcomes (i.e. what development could achieve, versus what it should achieve through the introduction of limits), it is interesting to understand how these numbers compare. This is important when establishing any quantitative figures for Westminster, as they need to be cognisant of current performance alongside what the industry standard will be through the adoption of the UKNZCBS shortly after the Retrofit First policy is adopted.

5.5 Establishing upfront embodied carbon requirements for Westminster

Upfront embodied carbon requirements

5.5.1 Considering the workstreams as detailed in this section, revised requirements for the Retrofit First policy were proposed as follows:

- Commercial – 550kg CO_2e/sqm (aspirational), 650kg CO_2e/sqm (limit)
- Residential (above 18 metres), including hotels – 600kg CO_2e/sqm (aspirational), 700kg CO_2e/sqm (limit)
- Residential (below 18 metres), including hotels – 550kg CO_2e/sqm (aspirational), 650kg CO_2e/sqm (limit)

5.5.2 The 'upfront embodied carbon requirements' include both an aspirational requirement, and a limit. The reason for including these are to mimic the LETI bands, with an upper and a lower value provided. It was also recognised that there may be a range of different site-specific circumstances which may render the aspirational requirement more challenging. This, along with the introduction of requirements being a step-change for the industry, led the council to include a 'limit' value. This recognises that it will take some time for development to adjust, and flexibility should be allowed for within the policy.

5.5.3 The terminology adopted as 'aspirational' requirements and 'limits' have also been based on existing phrasing used across the industry. For the case of 'limits' this reflects the UKNZCBS terminology. Whilst the council are unable to adopt the Standard at this current time, alignment where possible is important for ensuring consistency.

5.5.4 Comparison of upfront embodied carbon requirements between the Regulation 19 version and submission version of the policy are included in Table 19 below.

Table 19: Comparison of requirements used in the Retrofit First policy

	Regulation 19		Submission
	LETI band	*LETI band (in kgCO_2e/sqm)*	*kgCO_2e/sqm*
Commercial	A – B	350 – 475	550 – 650
Residential (above 18 metres), including hotels	C – D	400 – 500	600 – 700
Residential (below 18 metres), including hotels	B – C	500 – 675	550 – 650

5.5.5 As is shown in Table 19, the main change between Regulation 19 and submission are that the upfront embodied carbon requirements have been slightly relaxed. A recurring theme throughout consultation responses received during the Regulation 19 consultation were that the chosen LETI bands would be significantly difficult to achieve in the immediate future. The review of requirements through additional and updated evidence has revised the policy position to ensure the requirements are more robust and able to be achieved from when the policy is adopted in 2025.

5.5.6 Unlike the UKNZCBS, the submission version upfront embodied carbon requirements are the same for all development types, regardless of whether they are a retrofit, deep retrofit or new build development. This is to ensure consistency with the Regulation 19 version of the policy, along with recognising that due to upfront embodied carbon usually being much less in developments which retain and repurpose some of an existing building, these requirements would be easily achieved by deep retrofit and retrofit developments. As more data is obtained either through the implementation of the policy or other future industry organisations on the upfront embodied carbon performance of retrofit and deep retrofit schemes, this may be revised as part of the Full Review of the City Plan scheduled to commence in 2025. However, for now, there is an emphasis on encouraging retrofit and deep retrofit developments, therefore introducing performance requirements on these development types has not been advanced at this time.

5.5.7 Similarly, the upfront embodied carbon requirements specify a single figure and are not decreased year on year, as is evident from other London boroughs (see Section 4.2) and the UKNZCBS. It is recognised that construction materials will likely decarbonise and that in order to meet net-zero emission ambitions to limit global warming, there will need to be a continued decrease in upfront embodied carbon requirements. These should also reflect changes in industry practices and/or assessment methodologies as these become more widely adopted across the sector. While this may be recognised as an important aspect of continuing to drive performance in reducing carbon emissions from the built environment, the data publicly available on this matter, particularly at a local level for Westminster, is limited. This is a key aspect that the council wish to keep under review to ensure that the upfront embodied carbon requirements within the Retrofit First policy remain challenging but achievable.

Typologies – why this is different

5.5.8 As was the case with the Regulation 19 version of the policy, requirements differ based on the typology of the building. This has been informed based on the evidence generated for the policy, including the study prepared by WSP. As was discussed earlier in this section, a key differential with residential development is the ability to use timber in buildings over 18 metres in height due to considerations such as for fire safety. Given the limited land available in Westminster and current density levels, it is likely that a significant proportion of new residential development will be over 18 metres in height. Furthermore, given the existing City Plan and NPPF make firm commitments on house building, which should not be undermined by other policies, it is reasonable that higher upfront embodied carbon requirements for residential developments is incorporated within the policy.

5.5.9 As with the Regulation 19 version of the policy, there are three different upfront embodied carbon requirements which relate to commercial, residential and hotel development. Where a development scheme proposes a mix of uses, it is expected that the development would aim to deliver on whichever is the predominant use type of the building. This is specified within the

supporting text of the policy and has been included to ensure consistency with the approach set out within the London Plan Guidance.

5.5.10 It is understood that hotel developments can have high levels of embodied carbon, namely due to the amenities usually included in these buildings. Through reviews of hotel schemes referrable to the Mayor of London which have submitted Whole Life Carbon Assessments, along with the figures emerging from the UKNZCBS, it was evident that the inclusion of hotels within the residential upfront embodied carbon requirements was considered reasonable.

5.5.11 Where other development types are proposed, there are no specific upfront embodied carbon requirements to be set within the policy. This is namely due to the fact that other building typologies, such as specific infrastructure needs, will have bespoke requirements which are not readily able to be baselined and benchmarked. Whilst these uses would not need to adhere to specific requirements, proposed wording within the Retrofit First policy makes clear that Whole Life Carbon Assessments will still need to be completed, with opportunities to decrease embodied carbon being explored to deliver the lowest carbon development possible.

5.5.12 The upfront embodied carbon requirements are useful to drive improved performance in low carbon design initiatives at the planning application stage. However, Whole Life Carbon Assessments submitted at planning application represent schemes at detailed design and in some cases, before a construction contractor has been appointed. This can mean that the reality of what occurs during the construction phase of a building can alter significantly from the point at which planning permission is granted. This can be for a multitude of reasons, including procurement processes, material availability and revisions to designs. Whilst the RICS Standard second edition includes a contingency buffer to account for this potential change, it is possible that developments can result in different outcomes than what is estimated within the Whole Life Carbon Assessments. For this reason, the introduction of upfront embodied carbon aspirational requirements can help to drive improved performance, with it expected that development proposals will aim for this requirement, with the 'limit' allowing for any buffers and/or contingencies where the development requires it.

5.6 Carbon offsetting

5.6.1 Westminster currently has a carbon offsetting system, as required within the Development Plan, which focuses on excess operational carbon. These carbon emissions are identified at the planning application stage in Energy Statements produced for developments. Through the introduction of the Retrofit First policy, it is recognised that the focus on whole life carbon and indeed upfront embodied carbon emissions, rather than just operational carbon, calls for an adjustment on the way in which carbon emissions and associated offsetting is dealt with.

5.6.2 In the case of the emerging Retrofit First policy, two types of carbon offsetting are referenced. These are as follows:

- The ability for a credit to be applied to the existing operational carbon offset
- The introduction of an upfront embodied carbon offset

5.6.3 Figure 15 provides an illustrative example of the application of the two types of carbon offsetting.

Figure 15: Overview of carbon offsetting, as proposed in Retrofit First policy

Operational carbon offset

5.6.4 The basis of the price for existing operational carbon offsetting is set upon the 'local' cost of carbon and a proxy methodology for assessing this. This is detailed within the Planning Obligations and Affordable Housing (POAH) SPD, adopted in March 2024.[49] This specifies that for electricity-based emissions, the local price is £330 per tonne of CO_2e. For non-electricity-based emissions, the local price is set at £880 per tonne of CO_2e. The reason for a local cost of carbon is due to the fact that the carbon emissions from the operation of development takes place within the city.

5.6.5 The current focus of City Plan Policy 36: Energy on improving performance against Building Regulations has some implications for embodied carbon. Specifically, many measures to enhance operational performance use additional materials, which in turn, have an embodied carbon cost. To achieve a near 100% performance below the Part L minimum policy requirements could result in a building which is over engineered for the reality of the UK climate, at a relatively high carbon cost. Given the local cost of carbon outlined above, there may be a strong incentive for developers to increase material use to avoid these payments, resulting in higher upfront embodied carbon.

[49] See CORE_025 Planning Obligations and Affordable Housing Supplementary Planning Document (POAH SPD)

5.6.6 To prevent this from happening, the Retrofit First policy introduces a mechanism whereby any embodied carbon saved below the upfront embodied carbon aspirational requirement can be deducted from the excess operational carbon emissions identified in Energy Statements. An illustrative example of this is shown in Table 20 below, based on a commercial development which demonstrates that they achieve an upfront embodied carbon (A1-A5) performance of 540 kg CO_2e/sqm.

Table 20: Example of Retrofit First policy interaction with existing operational carbon offsetting process

	Illustrative example calculation		Operational carbon offset payment
Current operational carbon offsetting arrangement	Floorspace of development scheme	43,025 sqm	-
	Tonnes of operational carbon for offsetting (as identified in Energy Statement)	11,030 tonnes CO_2e	£3,639,900 (11,030 tonnes X £330)
Proposed offsetting arrangement with upfront embodied carbon credit	A1-A5 upfront embodied carbon achieved by development scheme	23,234 tonnes CO_2e (43,025 sqm X 540 kgCO_2e/sqm)	-
	A1-A5 upfront embodied carbon aspirational requirement, as set out within Retrofit First policy	23,664 tonnes CO_2e (43,025 sqm X 550 kgCO_2e/sqm)	-
	Upfront embodied carbon savings from aspirational requirement	430 tonnes CO_2e (23,664 tonnes – 23,234 tonnes)	-
	Revised operational carbon offset figure	10,600 tonnes CO_2e (11,030 tonnes – 430 tonnes)	£3,497,918 (10,600 tonnes X £330)

5.6.7 As is shown in Table 20, where upfront embodied carbon savings are credited to the excess operational carbon emissions, this results in a reduction of the carbon offset payment due by approximately £142,000.

5.6.8 The rationale for including the crediting mechanism is to drive improved performance in embodied carbon outcomes, recognising that this will become a greater proportion of whole life carbon emissions in buildings in the future. Introducing a system which looks holistically at carbon from a whole life perspective is also believed to be reasonable, given that carbon savings are direly needed in response to the climate emergency, irrespective of whether they are considered embodied or operational emissions.

5.6.9 The Viability Study Addendum (October 2024)[48] tested the crediting mechanism as part of the viability analysis of the emerging policy. This tested the impacts of crediting based on whether the

credit was applied to either the upfront embodied carbon aspirational requirement, or the limit. In both cases, and by virtue of the process reducing financial payments required by development schemes, there was no overall significant impact on development viability. For this reason, the proposed modifications to the policy make clear that the credit will be applied to the upfront embodied carbon aspirational requirement in order to further promote and award best-practice in low carbon buildings.

Upfront embodied carbon offsetting

5.6.10 The emerging Retrofit First policy accepts that there may be scenarios where the upfront embodied carbon requirements set by the policy are not achievable due to site specific constraints. As is included within the proposed wording of the policy, where this may be the case, carbon offsetting provides a mechanism to ensure the development can continue, while still accounting for its carbon impact. This offset payment would be charged at project completion, once the actual upfront embodied carbon of the development scheme is confirmed.

5.6.11 However, it is clear that as embodied carbon emissions are Scope 3 emissions which are not necessarily emitted within Westminster (but rather across the UK, or in some cases, globally) applying the local cost of carbon, as is currently used in operational carbon offsetting is likely to not be appropriate. As a result, the price of carbon for embodied carbon offsetting should be based upon an alternative method which takes into account the national and/or global nature of these emissions, which development activity in Westminster is influencing.

5.6.12 An appropriate price for embodied carbon offsetting will be reviewed in further detail following the adoption of the Retrofit First policy. This will form part of an update to the POAH SPD following the adoption of the City Plan Partial Review. However, in order to understand the potential viability impacts of the emerging policy, proxy prices were tested for the purposes of the Viability Study Addendum (October 2024). The HM Treasury Greenbook[50] refers to an estimated price of carbon based upon government modelling of IPCC carbon usage. The modelling is reproduced below in Table 21, alongside average prices of carbon over the remaining City Plan period (2025 to 2040).

[50] See Green Book Supplementary Guidance: Valuation of Energy Use and Greenhouse Gas Emissions for Appraisal. Data reproduced from Data Table 3: Carbon values and sensitivities 2010 – 2100 for appraisal – 2022 £ tCO2e

Table 21: Carbon values and sensitivities – 2022. Reproduced from Green Book Supplementary Guidance

	Carbon values (£/tonne CO_2e)		
	Low	Central	High
2025	137	273	410
2026	139	277	416
2027	141	281	422
2028	143	286	429
2029	145	290	435
2030	147	294	442
2031	149	299	448
2032	152	304	455
2033	154	308	462
2034	156	313	469
2035	159	318	476
2036	161	322	484
2037	164	327	491
2038	166	332	499
2039	169	337	506
2040	171	343	514

5.6.13 The average price of carbon between 2025 and 2040 (i.e. the remaining City Plan period) is as follows:

- Low: £153
- Central: £307
- High: £460

5.6.14 A key reason for using price proxies within the Viability Study Addendum (October 2024) was to understand if the introduction of an embodied carbon offsetting mechanism would render schemes unviable. This testing was based upon the actual or presumed upfront embodied carbon performance of 100 schemes, when compared to the proposed aspirational requirements and limits of the Retrofit First policy. The study then tested the three different HM Treasury Green Book prices to understand the potential impacts upon development viability. The impacts to viability increased with the consideration of the 'high' monetary figure and were therefore less when considering the 'low' monetary figure. However, it was found that the application of the 'low' monetary figure had limited impacts on development viability[51].

5.6.15 For this reason, the 'central' monetary figure was used as the basis to understand the cumulative impact of the Retrofit First policy with all other existing obligations under Westminster's Development Plan. When cost savings identified by the WSP Embodied Carbon Evidence Study

[51] See Tables 6.38.1 and 6.38.2 for scenarios RLV1, RLV2, RLV8 and RLV9 in Viability Study Addendum (October 2024)

were excluded, only one of the 100 development schemes tested became unviable through the testing of the Retrofit First policy, which incorporated the 'central' monetary value for embodied carbon offsetting.[52]

5.6.16 As the policy wording itself does not specify the monetary figure to be used for embodied carbon offsetting, this will be revised in further detail as part of an update to the POAH SPD.

[52] See Table 6.39.1 in Viability Study Addendum (October 2024)

5.7 Unlocking and promoting responsible retrofitting

5.7.1 In developing a policy to promote a retrofit first approach, an understanding of the current barriers to retrofitting needed to be acknowledged. Through initial stakeholder engagement and officer analysis, it was identified that current barriers to retrofit include:

- Heritage constraints such as the use of particular materials or components which promote a certain aesthetic which might be costly, difficult to procure or challenging to secure specific expertise for building works.
- Occupier needs including bespoke requirements, changes to work practices and specific building configurations required to achieve this and to respond to market demands.
- Viability and the ability to secure investment.
- Industry perceptions on retrofitted commercial environments and future rental yields or sale of assets.

5.7.2 Alongside these barriers was the council's recognition of the forthcoming Environmental Performance Certificate (EPC) requirement changes which will create greater impetus for existing buildings to be upgraded to improve energy performance to ensure that they are legally able to let and/or sold. In addition to this is the wider issue of existing buildings being able to adapt to climate change impacts. This can include upgrades to enhance user experiences in the face of a changing climate, or improvements to enable renewable energy uses such as connections to district heat networks or the upgrading of aged heating and cooling systems.

Policy support for retrofitting historic buildings

5.7.3 Given the challenges associated with retrofitting historic buildings, and the significant quantum of heritage assets across Westminster, a more coherent ambition on retrofitting from the council is needed. Furthermore, in order to effectively achieve an industry step-change, incentives for retrofit are required. As a result, the proposed policy includes wording to recognise that the retrofitting of historic buildings will be supported as long as the building is retrofitted in a sensitive manner. To address what this means, the current Historic England definition for 'responsible retrofit'[53] has been adopted as industry best practice, as showcased in Section 4.4 of this Topic Paper.

5.7.4 A key component of the inclusion of the policy wording around unlocking and promoting responsible retrofitting is to recognise the council's preference that historic buildings are retained first and foremost. However, it is clear that in order to ensure the continued use of these buildings now and into the future, sensitive adaptations will be required. Furthermore, it is recognised that there can be challenges in securing the retention and retrofit of historic buildings as from an investment point of view, there may not be any uplift in floorspace which can help to fund the

[53] Historic England (2023) Climate Change and Historic Building Adaptation Advice Note. Available from: https://historicengland.org.uk/content/docs/guidance/climate-change-historic-building-adaptation-consultation-draft/

often-costly works involved in retrofitting historic buildings. Where this occurs, there is a risk that these buildings may become vacant, not used to their full potential, and may continue to be inefficient in operations and not suitable in the context of climate adaptations. Therefore, the policy introduces wording to highlight that where a historic building is only able to be retained and upgraded through the addition of alterations or extensions which might have an impact on townscape, heritage or design considerations, the retention and retrofit of the existing building in the first place will be a material consideration.

5.7.5 This reinforces that the council would prefer to see an existing building retained and improved, rather than being lost to demolition. This is in order to ensure the longevity of our building stock and to reinforce the position of retrofitting as the preferable development option. Furthermore, the inclusion of this wording provides further encouragement to the type of development preference by the council. It is critical however that this wording intending to incentivize retrofit is not viewed in isolation. As with all policies within the City Plan, other aspects including amenity, heritage and environmental impacts and design will still need to be balanced on a case-by-case basis.

5.7.6 The adopted City Plan currently requires that a Sustainable Design Statement is prepared for: *'all applications which create new floorspace and/or where extensive works to retrofit/improve the environmental performance of a building are proposed'*.

5.7.7 The proposed wording within the Retrofit First policy recognises that it will be necessary that where alterations or extensions are taking place to historic buildings, that technical risks have been addressed and that harm to heritage assets has been either avoided or minimised where possible. Given the existing requirement that a Sustainable Design Statement is prepared, it is expected that the identification of any technical risks as required by the policy will be incorporated within the Sustainable Design Statement. This is to help reinforce the importance of the consideration of retrofit impacts as part of a holistic review of design measures. Clarification of this will be made within the Environment Supplementary Planning Document (SPD) following the adoption of the City Plan Partial Review.

Raising public awareness of upfront embodied carbon

5.7.8 During the policy development, feedback from industry stakeholders included evidence presented to the council about office occupancy habits, where sustainability was identified as a growing priority of future building owners and tenants. Further evidence was provided showing that this is a growing concern amongst younger potential employees. There are many existing schemes which assist developers in achieving and showcasing low operational carbon buildings, and the existing City Plan approach encourages these (for example, BREEAM ratings, and certified net-zero). A recurring issue however is that many of these certifications focus heavily on operational use, and do not have transparency to occupants around the embodied carbon associated with a building. This problem is complex, as while potential occupants create the demand side for 'best in class', or other high-quality buildings, given the way sustainable buildings are currently marketed and showcased, it is difficult for potential occupants to make informed choices about the overall carbon cost of a building.

5.7.9 To address this issue, and to promote further culture change across the industry, the proposed wording within the Retrofit First policy makes clear that for major schemes, developers should be transparent with potential occupants and visitors about the carbon cost of buildings. The exact

details will be revised following the adoption of the City Plan Partial Review and will become part of an update to the Planning Obligations and Affordable Housing (POAH) SPD.

5.8 Influencing future policy

5.8.1 The Retrofit First policy seeks to holistically introduce a presumption in favour of development which does not include substantial demolition, the introduction of upfront embodied carbon requirements, and support for the retention and upgrading of historic buildings to ensure optimal usage and to adapt to a changing climate and occupier needs.

5.8.2 The comprehensive nature of the Retrofit First policy developed by Westminster is one of the first and most ambitious planning policies developed by any local authority in the country. This has required extensive research and resources to develop the policy, and it is recognised that despite the innovative approach promoted by Westminster, this will be inconsistent with neighbouring authorities and indeed other jurisdictions across the UK.

5.8.3 As has been raised in this Topic Paper, it is clear that guidance from national government is currently lacking. For this reason, it is hoped that any lessons learned from the scoping, development, adoption and implementation of the Retrofit First policy will be utilised by Central Government to inform a consistent and standardised approach across the country, to ensure that there are no unnecessary burdens on individual authorities who are being proactive in addressing this critical source of carbon emissions.

5.8.4 In addition to influencing future national policy, the Retrofit First policy and subsequent policy changes it affects will be reviewed as part of the Full Review of the City Plan, due to commence in 2025. This will also mean that once the City Plan Partial Review is adopted, the policies it contains will be subject to almost immediate review. Whilst this may be seen to be a quick turnaround, for a policy such as Retrofit First which is a step-change from current practice and subject to rapid industry advances, the ability to review the policy in a short timeframe is welcomed and will be capitalised upon to continue to enhance the councils influence in delivering low carbon development across the city.

5.8.5 In addition to the Full Review of the City Plan, the London Plan is also currently commencing a Full Review. The evidence developed to support the Retrofit First policy will be shared with the GLA to help to inform their future policy direction and to re-use the resources developed by Westminster for the benefit of other London boroughs.

6. Policy Implementation

6.1 Environment Supplementary Planning Document

6.1.1 Westminster's existing Environment Supplementary Planning Document (ESPD) provides comprehensive guidance for the implementation of environmental related policies such as: air quality, local pollutants and their impacts, green infrastructure, surface water management, waste management, energy, sustainable design and retrofitting. The ESPD, like all Supplementary Planning Documents, is anchored in the adopted City Plan policies.

6.1.2 Following the adoption of the City Plan Partial Review, including the Retrofit First policy, the document will be supplemented with guidance to aid the implementation of the policy. As discussed in paragraph 5.7.7, this may include an update on the requirements of Sustainable Design Statements, which already forms part of the existing ESPD.

6.1.3 To streamline the process for where new requirements from the Retrofit First policy will need guidance in the ESPD, the council have prepared a draft Retrofit First Policy Guidance Document, which forms part of the submission package for review as part of the Examination in Public. It will be consulted with the general public along with the City Plan Partial Review evidence documents with the intention of being adopted by the council after the formal adoption of the City Plan Partial Review, including the Retrofit First policy.

6.1.4 The reason for producing the guidance now was to assist stakeholders in understanding the Retrofit First policy in further detail and to demonstrate how it will be implemented.[54]

6.1.5 The Retrofit First policy introduces requirements for:

- Pre-Redevelopment Audit
- Circular Economy Statement
- Whole Life Carbon Assessment

6.1.6 The Retrofit First Policy Guidance Document provides details on what information is required within each of these documents and how they will be reviewed by the council. Following the adoption of the Retrofit First policy, modifications may be made to the guidance to reflect any changes which might be borne out of further modifications to the policy and/or matters raised during the Examination process.

[54] See EV_R_004 Retrofit First Policy Guidance for Environment SPD

6.2 Planning Application Carbon Evaluation & Reduction 'PACER'

6.2.1 PACER is a digital platform that WCC are in the process of developing, which will be rolled out for use in planning applications from early 2025.[55] The Retrofit First Policy Guidance Document and the ESPD as mentioned above both include references to PACER, with additional guidance to be drafted and published by the council in due course.

6.2.2 The introduction of the PACER tool is key to the Retrofit First policy as it seeks to streamline the Whole Life Carbon Assessment process, making it more user friendly and consistent. This will mean that for most planning applications, a separate Whole Life Carbon Assessment report will not be required. Instead, applicants will be expected to input assessment data into the PACER platform. This then streamlines the assessment process for consultants commissioned to work on planning applications, along with the review process required to be undertaken by officers. The use of the tool will also help to better capture data, creating a more realistic and accurate baseline understanding of current practice across the city and where improvements can be made.

6.2.3 By using the PACER platform, debates around the methodology used in Whole Life Carbon Assessments will be minimised through the introduction of standardised reporting, giving greater certainty to applicants. The use of the tool will also assist decision-makers, such as officers and committees in comparing the carbon impacts of schemes across the city and how (in the case of the Retrofit First policy) upfront embodied carbon plays a role in appreciating whole life carbon impacts.

[55] Preoptima (2024) Planning Application Carbon Evaluation and Reduction (PACER) Tool. Available online: https://www.preoptima.com/preoptima-pacer

6.3 Planning Obligations and Affordable Housing Supplementary Planning Document

6.3.1 As was discussed in Section 5.6 of the Topic Paper, the Retrofit First policy introduces two different processes relating to carbon offsetting and provides further details on the need for developments to publish information relating to their upfront embodied carbon performance.

6.3.2 Further information on these elements of the policy will form part of an update to the existing Planning Obligations and Affordable Housing Supplementary Planning Document (POAH SPD) following the adoption of the City Plan Partial Review.

7. Conclusion

7.1 Conclusion

7.1.1 This Topic Paper has been prepared to provide further context on the reasons for a new policy focussing on upfront embodied carbon and the prioritisation of retrofit as part of the City Plan Partial Review.

7.1.2 By reviewing the climate change emergency in the context of Westminster alongside the existing planning policy framework, it is clear that whilst a significant reduction in carbon emissions is needed, there is a current gap in how embodied carbon emissions from the built environment are dealt with. The articulation of this gap forms the basis for the draft Retrofit First policy.

7.1.3 In developing this policy, this Topic Paper has demonstrated how analysis was undertaken by the council to understand upfront embodied carbon emissions, how these could be reduced and what this could look like for development schemes in the future. This included a detailed baselining exercise to understand current performance, how this relates to the existing requirements of the London Plan, and the scope for local planning policy to drive further reductions from current practice. This was bolstered by the preparation of supporting evidence by specialists to better understand the feasibility of implementing the policy and any impacts this might have on matters such as viability.

7.1.4 As demonstrated in this Topic Paper, the draft Retrofit First policy published as part of the Regulation 19 consultation garnered a range of views on the council's proposed approach. In reviewing these responses, the Topic Paper has provided rationale for the range of changes proposed to the policy to ensure that it remains robust and able to deliver on the council's agenda for reducing carbon emissions, whilst also being balanced with wider considerations of the Development Plan to continue to support sustainable growth in the city.

7.1.5 As identified within this Topic Paper, a combination of reducing rates of substantial demolition and the introduction of upfront embodied carbon requirements is reasonable in order to continue to decrease the carbon emissions associated with development activity in Westminster. In conjunction with explicit support for responsible retrofitting and a consideration of the barriers faced by historic buildings, the Retrofit First policy and the evidence which supports it would facilitate the delivery of well utilised, sustainable buildings across the city for the enjoyment of many generations to come.

7.1.6 In summary, this Topic Paper has shown that in order to balance the need to address the built environments' impact upon climate change alongside sustained growth across the city, a change to business-as-usual practices is needed. The draft policy alongside proposed modifications aims to address this in order to continue to achieve best-practice outcomes across the city. The emerging Retrofit First policy, along with the evidence base it relies upon will continue to be influential in the promoting the recognition of and support for low carbon development across the UK.

8. Appendices

Appendix 1
Third-party review of the WSP Embodied Carbon Evidence Base

MAX FORDHAM

Westminster City Council

Embodied Carbon Evidence Base - 3rd Party Review

03

22 Oct 2024

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ISSUE HISTORY

Issue	Date	Description
01	08.09.2024	For Comment
02	16.10.2024	For Comment
03	22.10.2024	Final Issue

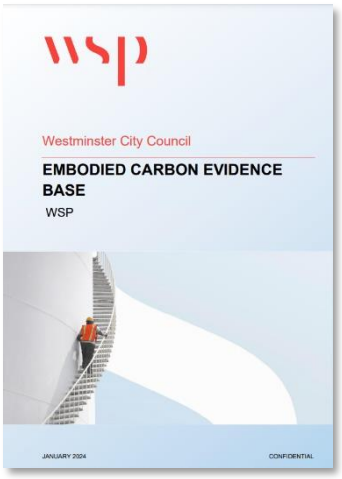
MAX FORDHAM LLP TEAM CONTRIBUTORS

Engineer (Initials)	Role
CP	Senior Sustainability Consultant
KB	Principal Sustainability Consultant
HB	Director, Sustainability

CONTENTS

1.0 INTRODUCTION

Westminster City Council (WCC) are in the process of carrying out a partial review of their current City Plan. As part of this review, the council are intending to adopt a new Retrofit First policy which incorporates embodied carbon targets.



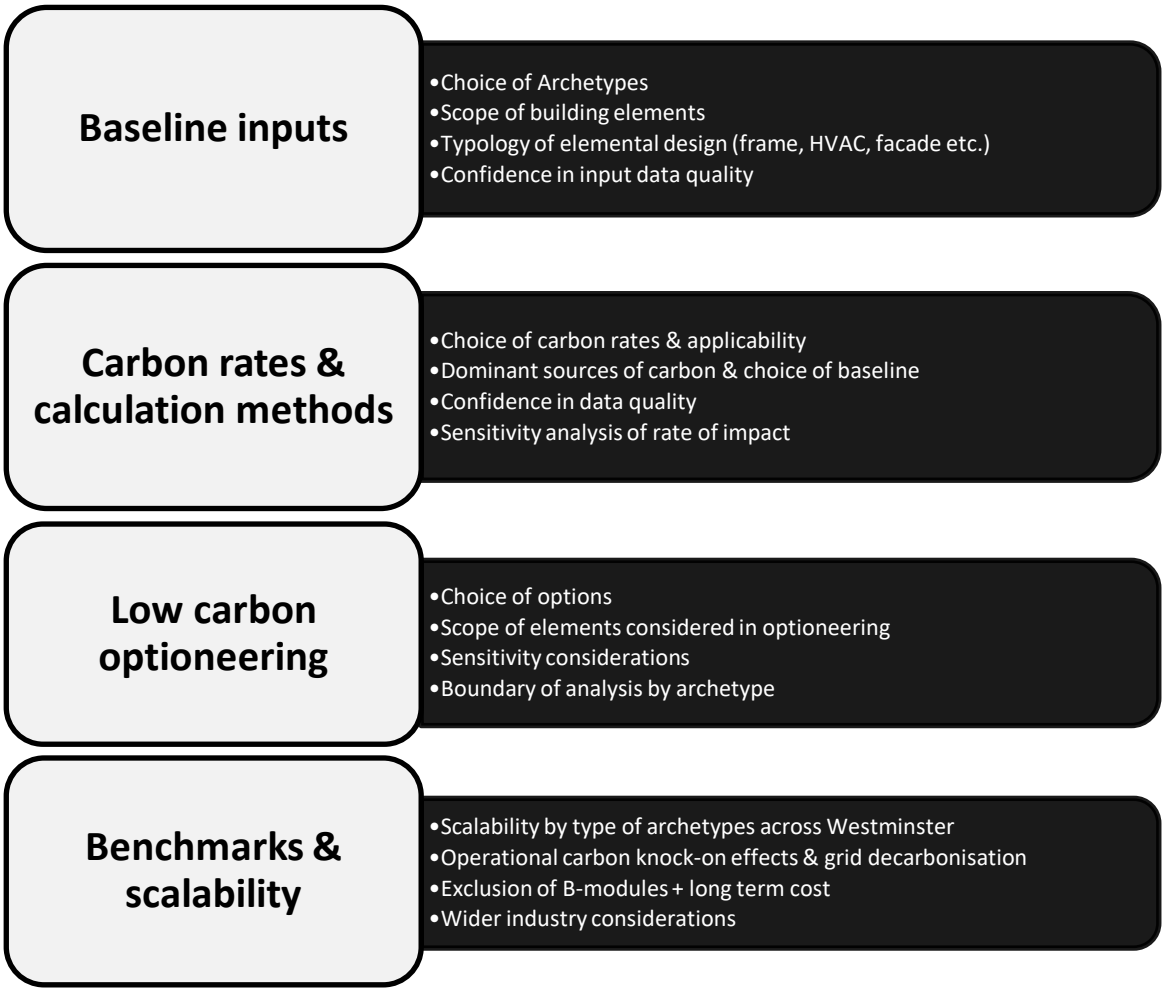
To support this policy, the council contracted the preparation of a document entitled 'Embodied Carbon Evidence Base'. This was published alongside the draft policy for public consultation between March and May 2024. Following this consultation, the Embodied Carbon Evidence Base document has been revised; Max Fordham LLP (MXF) were appointed to undertake a third-party review of the 'Evidence Base' and have been progressing this in parallel with the update.

A thorough review has been undertaken with the original authors, WSP, incorporating updates from a range of sources not limited to: WCC, Westminster Property Association, feedback from the consultation and Max Fordham.

The following report outlines the process and findings of this third-party review.

2.0 METHODOLOGY

The graphic below outlines the general areas of focus for the works undertaken by MXF during this 3rd Party review process.



2.1 Process

The 3rd Party review process took the general form of:

a) Desk studies – Reading, dissecting and researching elements of the report.
b) Addressing existing comments from the consultation process.
c) General workshops discussing overarching concepts.
d) Discipline specific workshops discussing principles, carbon data and quantity assumptions.
e) Comment Trackers compiled and issued.
f) Further specific workshops regarding ongoing updates/discussions.
g) Final additional commentary.
h) 3rd Party Report.

Discussions were ongoing during the report update process as these two work streams were continuing in parallel. All our suggestions, comments and recommendations were carefully considered and discussed by WSP and either included, excluded (with explanation), or partially dealt with depending on their final judgements.

3.0 SCOPE OF WORK

Max Fordhams' scope was to review, critique and comment on the report as presented. This process was required to operate in conjunction with report updates and within a timeframe driven by WCC policy timelines and the need for integration with cost analysis work being done separately in support of the WCC City Plan Partial Review. It was agreed with WCC that the MXF technical review would provide independent feedback during the development of the Final Evidence Base report and highlight any additional future studies that would be beneficial to broader industry stakeholders. Therefore, some of our recommendations could be argued to fall outside what is practicable for the given deadlines and resources available to WCC to be incorporated in the Final Evidence Base report.

Commentary in the following sections is in specific regard to those major elements of the report/study that were discussed due to comments from various parties (including MXF), rather than an exhaustive log of every comment / discussion.

4.0 RICS SECOND EDITION (V2)

A key aspect of this update to the Evidence Base was to align the study with the recent release of "RICS Whole Life Carbon Assessment for the Built Environment – 2nd Edition 2023". After engaging with WSP, the main areas of update included (but not limited to):

- Ensuring Baseline Specifications are applied.
- Utilising the MEP Supplementary Tables.
- Incorporating guidance relating to: A4, A5.3, C2, C3, C4.
- Updating Contingency Factors.

Figure 1 RICS Second Edition (V2)

4.1 Terms

Upfront Carbon: Lifecycle Stages **A1-A5**

Embodied Carbon: Lifecycle Stages **A1-C4** *(excluding B6/7/8)*

Whole Life Carbon: Lifecycle Stages **A1-C4** *(system boundary)*

5.0 COMMENTARY ON BASELINE DESIGNS

WSP and WCC had agreed the overall approach to undertaking baseline designs as part of the Retrofit First Policy development prior to MXF involvement as a 3rd Party reviewer. Key points to note:

- Initial discussions were focussed on the appropriateness of archetypes both generally, and in relation to feedback from the consultation. The archetypes were broadly fixed in scope and while commentary was welcomed, scope for major change was limited.
- Basements are included as it is seen as typical on schemes across the city and the impact of basements in terms of embodied carbon was something WCC wanted to understand. This also linked with the existing Policy 45: Basement Developments of the adopted WCC City Plan.
- The scope of reporting is to focus on the upfront carbon emissions for the purposes of informing policy targets, instead of whole life carbon. Whilst whole life carbon assessments would be required by the policy, this is not the focus of the Evidence Base report.

5.1 Office

The main element of discussion focussed on the grid and façade materiality. With regards to the 12x12m baseline, we highlighted this was on the more extreme end of 'business-as-usual' but did fall within this spectrum. Our preference is to see a 9x9m grid so as not to give too much credence to what we perceive to be a 'legacy design' of long-span 12m bays.

We did not feel that WSPs choice of Terracotta represented a major issue. We agreed it was less common than a lot of other facade types we see. However, and germane to the purpose of this study, our internal studies had concluded a similar finding to WSP that Terracotta represented a higher-than-average rainscreen system, from an upfront carbon perspective. This is naturally subject to a variety of caveats surrounding form, panel type etc. but nonetheless this is a reasonable carbon placeholder for a system on the spectrum of 'business-as-usual' within Westminster.

In reference to the appropriateness of the Window-to-Wall Ratio (WWR), we recommended a sensitivity analysis covering a few different types of business-as-usual facades, and a few Window-Wall-Ratio's within the 60-70% to establish ranges of façade impact. However, if the decision is taken to keep with the Terracotta as a mid-upper Facade typology, with 68% WWR, we consider this to sit within the spectrum of business-as-usual in terms of carbon and form.

5.2 Residential

Our primary comments surrounded the form factor (or Façade Form Factor[1]) and its appropriateness to a 'generic archetype'. The FFF used is fairly high due to the nature of the long, slender form; however, this form is both reasonable for residential blocks and also within a middle range of FFF for this typology (with deep circular plans at one end, and slender W/L/Zig-Zag plans at the other).

[1] 'FFF', as defined within CWCT standards)

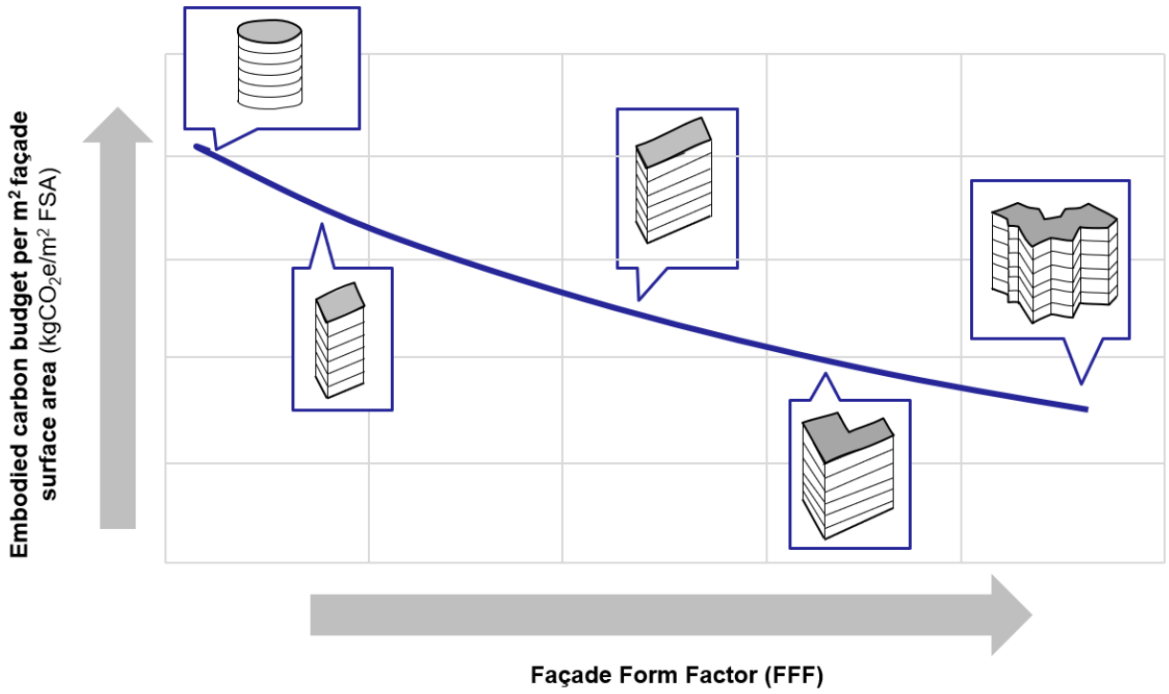


Figure 2 - Embodied Carbon Budget by Facade Form Factor (CWCT, How to Calculate Embodied Carbon of Facades: A Methodology. Version 1. Sept 2022)

It should be noted that this is specific to detached blocks and, as such, the Façade carbon impacts will be a higher percentage of the total than is typical for other types of buildings. We recommended a small study to outline the range of impacts the façade would have on a range of typologies, to provide a better sense of the sensitivity of residential form to the 'kgCO2e/m^2 GIA' impacts.

5.3 Mixed Use

The comments made above apply to the Mixed-use option as this was a hybrid of the Office and Residential typologies and rationale.

5.4 General

Archetypes were chosen as simple buildings as opposed to exact reflections of most real-world, constrained building sites within densely populated urban areas. These simplified models were chosen as they present the clearest, user-friendly illustration of the impact each type of reduction measure could have. We broadly agreed with this approach.

In addition to the above, it was agreed that constrained sites tend to mean higher carbon, as there is less scope to place elements 'optimally'. However, it should be feasible for a design team to ascertain the range of impacts from site-specific peculiarities, and therefore justify a degree of increase, if appropriate.

WCC understands challenges in developing brownfield sites that have a plethora of constraints - e.g. over underground tunnels. Emerging WCC tools, like PACER, aspires to provide planning officers the tools they need to judge the above.

We've recommended that the archetype remains as a simplified model with future projects explaining within their own Whole Life Carbon reports at planning application stage (once the Retrofit First policy is adopted) what site-specific-constraints have caused unavoidable uplifts, provide clear evidence of carbon design efficiencies and a rough range of the kgCO2e/m^2 uplift the site constraints bring to a scheme.

6.0 COMMENTARY ON CARBON DATA

Discipline	Carbon Data References	3rd Party review comments
Structures	IStructE - HTCEC v2 RICS v2	Carbon Rates reviewed – No comments
Façade	Centre for Window and Cladding Technology (CWCT) – How to Calculate the Embodied Carbon of Facades	Carbon Rates reviewed – Minor comments to which WSP provided response
Building Services	RICS v2 CIBSE TM65	Carbon Rates reviewed – No Comments. Minor disagreements but not unusual for MEP carbon data
Finishes	WSP Internal Benchmarks	Carbon Rates reviewed – No Comments
Construction	RICS v2	Carbon Rates reviewed – No Comments
External Works	GLA Benchmarks	Carbon Rates reviewed – No Comments
FF&E	GLA Benchmarks	Carbon Rates reviewed – No Comments

6.1 Quantity Data

Discipline	Quantity Data References	3rd Party review comments
Structures	WSP internal models / tables	Data reviewed – Minor Comments. WSP confirmed original data or updated to suit
Façade	WSP internal models / tables	Data reviewed – Minor Comments. WSP confirmed original data
Building Services	WSP internal models / tables RICS v2 – MEP Supplementary Tables	Data reviewed – No Comments
Finishes	WSP Internal Benchmarks	Data reviewed – Minor Comments.
External Works	GLA Benchmarks	N/A
FF&E	GLA Benchmarks	N/A

7.0 COMMENTARY ON TARGETS

The improvement scenarios presented within the WSP Evidence Base report were generally felt to be reasonable reflections of achievable low-carbon design. The comments that were not agreed upon and included, tended to have relatively small overall carbon impacts. The only major comment that was not included was the desire to see the basement removed as part of the waterfall chart. While the parties generally agreed on the concept, it was left in due to existing, conflicting policy that allows basements (under certain conditions). It is therefore expected that any targets set by WCC would be revisited if the policy position on basement development is altered in the future. In the meantime, it is evident that the carbon impact associated with basement development (as shown within the WSP report) is substantial and therefore should be considered in any planning decisions.

8.0 CONCLUSION

Overall, we are satisfied with the outcome of this process and the quality of the final Embodied Carbon Evidence Base. A great deal of commentary has been included, along with a significant amount of productive discussion, with our outstanding recommendations generally falling into the categories of 'wider industry issues lacking hard evidential bases' (i.e. papers, reports etc.) or else conflicting policy in the case of basement development. The following Appendices provide detail on key comments as well as some other suggested actions.

As with all examples of early adopters – in this case upfront carbon targets – there is natural room for improvement in future iterations, whether this be by WCC or other government bodies across the UK. Various examples of further studies and areas for improvement are outlined in this report, along with a general recommendation for a widening of scope to address additional archetypes as well as a range of typologies within a given archetype. Depending on the success and practicality of the recently released pilot of the UK Net Zero Carbon Building Standard, this could also form a basis for further policy given it has undertaken a broader study – albeit with a fundamentally different viewpoint (top-down allocations balanced with bottom-up figures) and is not focused solely on archetypes typical to Westminster.

Within the context of the Climate Emergency, and the variety of plans to tackle it, we whole-heartedly support both the policy this Evidence Base informs, and the targets proposed by WCC. We consider these to be a crucial first step towards meeting the countries obligations to its carbon reduction pathway and a mechanism by which meaningful reductions can be realised.

9.0 APPENDIX A – KEY IMPROVEMENTS SUGGESTED TO THE WSP EVIDENCE BASE REPORT

This Appendix sets out a number of improvements which were identified by MXF when reviewing the WSP Evidence Base report. These improvements do not include the technical quantification or carbon data comments provided during the course of this 3rd Party review. The improvements are divided into two areas as follows:

- **Type A**: Comments regarding specific choices made within the study, which MXF recommended be changed to improve the WSP report.
- **Type B**: Comments regarding issues present within the wider Embodied Carbon sector. These typically sit outside the sphere of published Standards, or Guidance, and are generally open for varying levels of debate. These have been included here for completeness, even though it is recognised that all of these issues could not be solved within the limited scope of the WCC commissioned work.

9.1 Office & Mixed-Use Archetypes

Element	Type A Comment	Outcome
Façade: Window-to-Wall Ratio (WWR)	While balancing overheating and daylight, we recommended that a first action in reducing façade impacts on Offices is to reduce the WWR. In the same vein as Structures, where swapping to Timber on a large grid isn't as impactful as reducing the grid, we recommended each Office (and Mixed Use) option to start with reducing the WWR (i.e. Office, 70% to 50%) in conjunction with material swaps. Glazed areas should have higher upfront carbon rates than low-carbon solid build-ups and, as such, should represent clear 'real-world' carbon reductions when reducing the WWR. We're of the opinion that the potential increase in lighting demand is outweighed by both Upfront Carbon and Cooling demand reductions when reducing the WWR.	Section 3.6.3 includes reference to this concept. In terms of quantification, some high-level analysis conducted. However, a more rigorous analysis to establish more certainty went beyond the scope of the Study.
MEP: Whole Life	We recommended expanding the scope of the study to a Whole-life scope, as opposed to just Upfront carbon. In our experience, optioneering of Building Services without accounting for knock-on Operational Carbon impacts can lead to a perverse outcomes where lower upfront solutions may result in higher whole-life emissions – even when using decarbonised grid scenarios. We agreed there is a challenge in choosing an Upfront Target by which to measure planning submissions, and we would suggest all optioneering within the Evidence Base is undertaken with B6 estimate ranges to demonstrate Whole Life Carbon accounting. Ideally this should be in-line with the RICS 2nd edition guidance for using Carbon Conversion factors "when making design decisions - understanding trade-offs" i.e. Set 1, Scenarios A&B (ideally C as well) - see Appendix I. We suggested this is implicitly mandatory under RICS 2nd edition. The justification for the above stems from our experience in undertaking Building Services Whole Life Carbon Optioneering. Indicative examples where Upfront Carbon is not a sufficient metric are: • Full Variable Refrigerant Flow systems (VRF) are currently only available with R32 Refrigerant. It is fairly well known that the B1 emissions are extremely large due to the high leakage rates and large volume of refrigerant (TM 65). From a whole life perspective (even over 15 years) it is typically the case that VRF is the highest overall emissions when compared to a variety of 2/4 pipe Heat Pump options. This would not be captured within an Upfront-only assessment.	Section 4.1.7 outlines the whole life carbon impacts of the baseline and improved scenarios. Energy modelling was beyond the scope of the study and thus not included. The latter comments regarding the issues with Upfront Carbon as building services metric are an inherent issue within the wider industry.

Additionally, this could have the effect of recommending VRF systems as they tend to result in the lower upfront carbon.

Low Global Warming Potential (GWP) refrigerant Heat Pumps tend to be larger and slightly higher Upfront Carbon. This can be offset due to the very low B1 emissions, but again, would not be captured in an Upfront Carbon only assessment and could push teams to opt for higher-GWP-refrigerant systems to lower their Upfront Carbon score. We recommend early-stage comparisons based on Upfront Carbon + Refrigerant Leakage + Operational (using best available energy estimates and the seasonal coefficient of performances (SCOPS) / seasonal energy efficiency ratios (SEERS) of the units). This can give a much more balanced picture of which kind of system / unit is likely to be lowest carbon over the next 15 years (approximate lifetime of the Heat Pump).

- All electric systems can often be much lower Upfront Carbon (e.g. Electric Radiators versus Underfloor Heating with a Heat Pump). However, they are also known to use greater energy, or are, at least, extremely sensitive to the designers' assumptions on controls. This would not be captured within an Upfront only assessment. As dealt with in the new Pilot of the UK Net Zero Carbon Standard, all electric systems can be prone to high peak-demand loads, which in turn, would necessitate a larger capacity grid, or storage, all of which have complex carbon knock-on effects.

WSP added a section on Embodied Carbon emissions, including B1 but excluding B6.

Structure: Grid	We recommended further grid spacing reductions (with associated slab carbon reductions). An additional section has been added demonstrating the scales of these improvements.	Figure 4.5 outlines the scale of impact of further grid reductions.
Structure: Frame/Slabs	We recommended there should be a greater emphasis on minimising material use, with further options to be included representing other slab / framing choices for shorter spans i.e. concrete waffles, Post-Tensioned (PT) solutions etc. A section has been added within the WSP report demonstrating a selection of the options in isolation from the main targets.	Appendix B outlines these impacts, but adding these variations into the waterfall analysis was not deemed practicable within the project's constraints.
Structure: CLT	We recommended additions of sound/fireproofing/connections rates based off the useful recent guidance from IStructE/Arup report "Assessing carbon in timber buildings: how to factor in connections, fire protection and soundproofing".	Added within the structural quantification.

Element	Type B comment	Outcome
Façade: Glazing	An important issue inherent in Upfront Carbon comparisons of facades is that Insulated Glazing Units (IGUs) tend to have a service life that is much shorter than the standard building Reference Service Period (RSP) (around 25-30yrs). Meanwhile, solid elements should last at least the RSP. Without the 'doubling' of the glazing carbon from mid-life replacement, it can appear that large, glazed elements (Curtain Walling) could be competitive solutions, as the Upfront Carbon may be only slightly higher, if not less, than a range of solid wall build-ups. This could have the effect of downplaying the impacts of highly glazed facades, and potentially encourage maximisation of their use. We appreciate this is an industry wide challenge inherent in Upfront targets. If a study like the one completed by WSP was replicated by another organisation in the future, we recommend a graphical representation of a $1m^2$ of Terracotta versus Curtain walling over 60 years, and commentary should be provided to highlight that over-glazing has a large Embodied Carbon impact (A1-C4) and is typically a higher carbon choice.	Section 3.6.3 includes reference to this concept.
Façade: High Recycled Content Aluminium	To summarise the below, we don't think encouraging developers to purchase aluminium with above-averagely-available scrap contents will result in envelopes with lower upfront carbon - from an atmospheric perspective. We are of the opinion that high-recycled-content aluminium is another example of a 'hoarding of a scarce resource'. As with the GGBS discussion noted separately, we do not think that utilising a product with more than the 'averagely available' post-consumer aluminium content will provide as much 'net climatic effect' as an Environmental Product Declaration (EPD) would suggest. Aluminium is already very highly recycled due to its fairly high intrinsic value (https://european-aluminium.eu/wp-content/uploads/2022/10/collection-of-aluminium-from-buildings-in-europe.pdf), so the atmosphere isn't likely to see any more aluminium being recycled, and thus a reduction in primary aluminium production. The quantum of scrap available is forecast to grow (https://european-aluminium.eu/wp-content/uploads/2022/08/european-aluminium-circular-aluminium-action-plan.pdf) but we do not think the purchasing high-recycled content aluminium today would be linked to increased take-up of this resource in the future, as it is already heavily utilised across the industries using aluminium (automotive, construction, packaging etc.). The use of scrap aluminium is definitively a great thing due to the huge reduction in emissions comparing to primary production, but the hoarding of that resource in specific products gives a warped perspective of that products real climatic impact. *Much like the GGBS analogy, a very simplistic analogy could be: The EU&UK*	4.1.2.2 includes reference to this concept.

produces 3 portions of aluminium a year, 1 from scrap, 2 from primary routes. Manufacturer A buys 1 portion of scrap, so Manufacturer B & C are left with the 2 portions from primary routes. If Project A uses Manufacturer A's products, they get a low carbon score, but projects B & C are left with the remaining Manufacturers and get a high carbon score. The Atmosphere has seen no difference in annual aluminium emissions with the assumption that the scrap would've been utilised regardless of Manufacturers A commercial decision to buy it in its entirety.

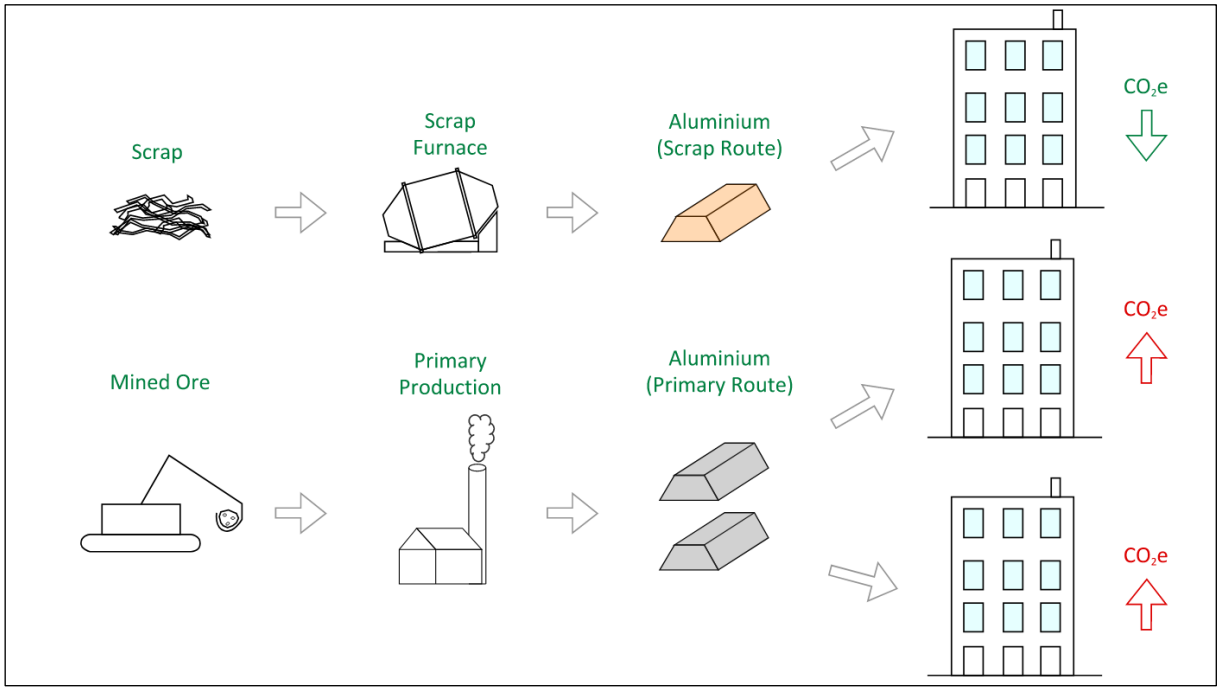


Figure 3 - Scarce Resource Analogy

The above arguments are not meant to infer any issues with individual manufacturers commercial approach. It is instead meant to highlight the inherent disconnect between how carbon is accounted on a project level, versus how carbon is accounted at a regional/international/atmospheric level. We argue reducing the latter is the overarching aim of all embodied carbon work.

Within this specific example, most of the high-percentage-recycled Aluminium producers operate with lots of renewable energy (for example, hydro grids + wind and solar), they will be better (and a net-improvement) on

	other aluminium manufacturers, just not to the degree stated in the EPD - from an atmospheric perspective. It should be noted that this is our opinion based on personal research and not one published in any industry papers.	
Façade: Timber Cladding	Timber cladding, when used carefully, represents a likely lower-bound façade solution, from an Upfront Carbon perspective. While we harboured reservations regarding the likelihood such a façade solution would be viable for most projects today, we are not aware of any technical reasons this would not be allowable (indeed some recent flagship projects have utilised forms of timber cladding like the Black and White Building, Hackney, London). We did raise the issue regarding insurance and general perceptions of risk, but broadly agreed that industry appetites change. We also agreed that target setting should focus on the mid-to-long term rather than the immediate short-term. We also highlighted that the figures presented where achievable through other low-carbon façade typologies, coupled with WWR reductions and general lean design principles applied to façade design.	N/A
Finishes: Reclaimed Raised Access Floor	Generally within this report, we discuss the issues surrounding a concept loosely termed as the 'scare resource principle'. The test can be simplified to a few qualifying questions: 1. Is the resource already fully utilised a manner similar to the intended purpose? (e.g. If almost all available scrap of a given material is recycled. Opting to increase levels of recycled content from that material in your product doesn't result in more scrap being recycled) 2. Is it abundant? (Can this be scaled for the whole market) 3. Is it a product utilising this resource in approximate ratio that is equal to the market average? In practice, there are lots more test questions depending on the specific material/products, but this covers some of the major principles. In the case of reclaimed raised access floor, we are of the opinion that irrespective of the growing appetite to reclaim, there is not currently enough supply to meet a demand for 50% of all raised access floors to be sourced from reclaimed stock. Additionally, we think it is unlikely that question 2 is realistic for this product. However, and crucially for this procurement choice, we believe that question 1 is far from being satisfied, with reclamation and refurbishment of raised access floors being far from the norm. As such, we agree that: a) Lots of schemes would be able to procure a degree of reclaimed units as they are not currently all being used. b) Lots of refurbishment schemes would have scope to re-use, or refurbish existing in-situ units. c) A target of 50% could go a long way in helping develop this fledgling market which would undoubtedly provide tangible 'real-world' carbon reductions.	N/A

	Planning stage 'actions for carbon reduction' that rely on the procurement of resources of uncertain availability, represent a natural risk to realising carbon reductions. To mitigate this, we'd recommend WCC: • Show preference to projects demonstrating paid-for reservations of stock. • Condition the requirement to show best attempts as procuring stock that meet their criteria. • Condition the requirement to demonstrate best attempts to send existing in-situ stock to reclamation companies. • Accept some projects will not be able to achieve use of Reclaimed Raised Access Floors, either at all, or at the percentages claimed during planning submissions.	
MEP: General	Building services solutions are an order of magnitude more complex than those of Structure of Façades when it comes to permutations and specific product choices. We broadly agree that the design choices taken should represent reductions in upfront carbon without whole-life penalties, with the inherent caveat that carbon data behind MEP studies tends to be of significant lower quality and certainty than those of Structures or Facades. As such, new data may emerge in the coming years that change this perspective. Most crucially, we view the overall reductions demonstrated from the Baseline to the Improved scenarios as being a good balance of challenging and achievable, if they were to be adopted as targets within the WCC Retrofit First policy.	N/A
Structure: Electric Arc Furnace Steel	We recommended removing Electric Arc Furnace (EAF) steel as a method for reducing structural carbon. This material also falls into the 'scarce resource' category. Our research suggests that: a) We are already utilising the vast majority of available scrap (and exporting around 18%, but it is unclear if this is due to commercial considerations rather than an inability to process it[2]); and b) is not a resource projected to experience large growth, and therefore in need of market signalling to expand the market. As such, the atmosphere experiences the combined emissions of the current 'close-to-capacity' supply of EAF steel, and that of Blast Furnaces (BF). Projects that hoard this resource, i.e. procure large quantities of EAF steel, cause large on-paper reductions for their project, but do not affect the wider supply chain. Utilising EAF steel can also run the risk of 'masking' inefficient steel use as, even with poorly designed structures, the EAF carbon factor would present a low figure for Structural Steel impacts. Other Engineering consultancies have recently taken a similar decision to the above and no longer include specifying EAF steel within their specifications as a method of carbon reduction.	Remains within the model with justification that the 15% EAF is only a small increase on the assumed baseline (1.74 kgCO2e/kg assumes approximately 40% EAF procurement). As noted, this comment will be moot once the UK switches to EAF only production.

	In addition, the IStructE HTCEC v2 figure – corroborated by the RICS 2nd edition baseline specification – recommends utilising the blended carbon rate representing the 'average UK consumption' of open sections from the various types of furnaces. This already implies procurement of around 40% EAF steel. Adding 15% would take average EAF procurement above the average percentage of production of EAF steel within the European Union and UK markets, representing a minor case of 'hoarding a scarce resource'. It's also worth noting that there is a strong chance that this discussion is moot in the short/mid-term, as the UKs pair of Blast Furnaces are expected to swap to EAFs. This would drastically change the UK consumed carbon figure – albeit the scale of the real-world reductions from this swap is another debatable subject. 1. https://euric.org/resource-hub/press-releases-statements/statement-recycled-steel-scrap-is-not-a-strategic-nor-a-critical-raw-material	
Structure: Steel Carbon Factor	Tying in with the above comment, we are principally in favour of using the RICS 2nd edition / IStuctEs HTCEC v2 recommendation of utilising the carbon rate of the 'apparent UK consumption' of open sections (I.e. a weighted carbon rate based on how much of each format of steel the UK consumes). In our opinion, this represents the fairest way to assess carbon, a level playing field where projects reduce their carbon footprint by simply using less steel for each m^2 of GIA created. However, it should be noted that this steel doesn't 'exist', in the context of readily procuring steel with a carbon rate of around 1.74 kgCO2e/kg. What this means in practice is that WCC should be prepared that As-Built models may have significant swings in Upfront carbon for steel framed buildings. For instance, the Steel Frame will represent a large portion of the carbon, if BF steel is procured with a rate of around 2.45 kgCO2e/kg, this would cause a 43% increase in A1-A3 carbon. While procuring EAF steel with a rate around 0.56 kgCO2e/kg would result in a drop of around 67% in steel frame A1-A3 carbon. This is due to the fact that RICS requires you to use EPDs of the procured materials at Post-Construction, rather than average rates. While procuring steel for multiple sources may be an option for some projects, there may be others where this would represent unreasonable complexity/cost that may prohibit hitting the blended carbon rate. WCC should provide a clear guidance on the factor that should be used at the planning stage.	N/A

9.2 Residential

Element	Type A comment	Outcome
MEP: Cooling	We recommended cooling was included with the residential typology due to our perceptions of current practice. This has since been incorporated. Cooling integration will have whole life carbon implications both in the upfront carbon of more material, as well as in the in-use emissions of refrigerant leakage and energy use (depending on the form of system chosen).	Cooling was added to the Residential baseline.
Structure: Frame/Slabs	We recommended the addition of a PT Flat Slab and then a lean Waffle Slab into the waterfall chart. While these are not typical for residential projects, we feel that reducing material use is paramount, and the current waterfall chart doesn't challenge the status-quo of traditional Reinforced Concrete (RC) Flat Slab construction (a system known for its inefficient use of material). We are also of the opinion that even with the additional column heights and facade heights, deeper floor systems like Waffles still represent strong material use and 'real-world' carbon savings.	Appendix B outlines these impacts, but adding these variations into the waterfall analysis was not deemed practicable within the project's constraints.

Element	Type B comment
Structure: GGBS	We recommended removing the use of 50% Supplementary Cementitious Materials (SCMs) as part of the Structural improvements. In our opinion, 50% SCMs is likely to represent an achievable, real-world reduction method at some point in the mid-term. We want to highlight that in the near-time, this is very unlikely to present a 'real atmospheric reduction' due to availability of SCMs within the market. It is likely most projects would be obliged to procure GGBS in percentages above the average nationally/internationally available quantities, which is very unlikely to result in any 'real-world' carbon reduction (see the cross-industry report "The efficient use of GGBS in reducing global emissions"). Given that the two main Blast Furnaces in the UK (the bulk of the domestic source of GGBS) are intended to be closed soon, and replaced with Electric Arc Furnaces, the future of UK GGBS supply is in question. The latest BS8500 now allows multi-component mixes but, given the uncertainty around the main source of cement replacements (GGBS), we'd recommend an Multi-Component Cements (MCC) of 15% Limestone Fines and 15% GGBS. While the inclusion of GGBS may seem contradictory, we'd hope this is a reasonable assumption of an achievable, yet ambitious enough, carbon target 'placeholder' - even if GGBS is no longer available, other SCMs / blends should be sufficient to meet such a target.

10.0 APPENDIX B – GATEWAY DECISIONS

During the review process we concluded that the report forming the Evidence Base has a medium-to-high chance of being treated as a de-facto 'design-guide', in spite of the nature of the document. As such, we suggested that WSP/WCC may benefit from including specific sections within the report that give focus and context to high-impact design decisions – termed 'Gateway Decisions' – that WCC would like to see particular focus / attention from design teams at planning. These gateways were chosen as a handful of examples of actions that, if left unconsidered, tend to preclude a buildings ability to achieve meaningful carbon reductions. Additionally, we have produced the following gateways that would assist other stakeholders:

- Offsetting the risk that other, more debatable, material swaps could mask an otherwise business-as-usual building e.g. claiming to be use extremely high percentages of recycled content materials.
- Guide less informed Clients as to what decisions need careful consideration. Some of the decisions noted below are established as per the client brief / inherent assumptions by the design team to meet a project's expectations (basements, column free ground floor spaces etc.), or are undertaken with little understanding of wider impacts (compressing a building to suit specific heights, grids etc.)

Note, the commentary below is a recommendation for the report, and is by no means a natural requirement of the report in its intended form i.e. an Evidence Base.

10.1 Loadings

We recommend requiring a justification of chosen Imposed and Superimposed Loads compared to Code Minimums (more applicable to Commercial / Mixed-use schemes). Over designing due to nebulous industry perceptions, or 'this is how we've done it before', should be challenged. Likewise for Facade loading (designing for the actual facade) and Roof Loads (unnecessarily high area loads for maximum flexibility).

(This section was not included directly)

10.2 Grid

We're of the opinion that grid-spacing is the foremost design decision that produces the most real-world carbon reductions; one of the first keystone "Gateway" design choices that either hinders or enables a project to meaningfully reduce its upfront carbon (Carbon vs. cost option mapping: A tool for improving early-stage design decisions, Gauch et al, 2022). We recommended including a grid-only "waterfall chart" showing how the potential carbon reduction for 9x9m, 9x7.5m and 7.5x7.5m would be impactful. We also recommend a wider scope of study looking into more material/slab/framing choices with averages or trends extracted.

(This section was ostensibly included in the form of a special section on grids)

10.3 Transfer Structure

The simplistic perception of 'flexibility' meaning 'column free' is costing many projects any chance of meaningfully reducing their upfront carbon. Traditional practices of large, lower-storey Transfer Slabs, or arrays of Transfer Beams, require extravagant increases in material use, and carbon, as the load paths being moved are close to their maximum (i.e. a column near the ground carrying many floors worth of load). Fully exploring the real-world impacts of having a column within a given space, and exhausting all other options, (e.g. turning it into a feature, digging into and challenging Estate Agents opinions) must be completed before Transfers are even considered.

(This section was not included. Transfer structure was not part of the baselines)

10.4 Basements

The large impacts of basement substructure was already referenced within the report.

(This section was already included)

10.5 Compressed Structural Floor Zones

We assume the archetype is based off a 'free' Structural Zone (i.e. Beams are sized for efficiency). This is the preferred method of designing structures but is rarely the case in practice, especially within Central London. A few typical behaviours that result in 'squashed' Structural Zones are:

- Fitting the proposed massing under a planning requirement
- Maximising the number of floors for a certain clear head height
- MEP distribution

Our experience is that the Structural Zone - the zone available for structure to fit within - is one of the first to get reduced. This may take the form of reducing the size of downstand beams, or it may be a simple 'unconscious' decision to opt for a flat soffit (i.e. RC Flat Slab) solution. Avoiding getting into structural calculations, a fundamental geometric parameter of structural members is known as its Stiffness. Within this calculation is a variety of formulas that all have the' effective depth' of a section to an exponent (power of 3 or 4). Simplistically, this demonstrates that the impact on performance of reducing the depth of the Structural Zone are extreme. To counter this, disproportionately more mass or reinforcement is added, all of which adds to upfront carbon - and when applied over a whole floor system - quickly moves projects way from any change of being low-upfront-carbon buildings. This is fairly well known in the extremes, for instance, a Composite Deck with Downstand steel compared to a SlimFlor solution over the same span show these impacts clearly. However, and crucially, we feel these impacts are less well understood within business-as-usual systems i.e. taking 50mm off a downstand solution, or forcing a design to use heavier Universal Columns (UC), or not even considering downstand or deeper concrete solutions (slab on beams, waffles etc.).

Appendix B of the report, section on steel, briefly outlines this concept in terms of an example increase in steel weight due to reducing the available downstand depth.

We recommended a section outlining the importance of the Structural Zone in the context of managing structural carbon emissions and lean material use. Presenting two simple graphs could provide graphics to demonstrate the issue:

1) A 9x9 Composite Steel Frame bay. Plotting the mass of the steel while reducing the maximum downstand depth in 50mm increments (a simple 3D stick model)

2) A 7.5x7.5 grid. Plotting the concrete and reinforcement mass for a RC Flat Slab and Waffle Slab (or additionally a PT Flat Slab, or 2-way Slab-on-Beams)

This purpose of this section would be to demonstrate the important of the Structural Zone and its implications, not to force downstand solutions at all costs (for instance, PT Slabs might be as competitive as some downstand solutions). This should then demonstrate the need for the Structural Zone to form a stronger part of the discussion when balancing floor-to-floor heights, squeezing in stories and services strategy; while accounting for knock-on impacts on facade quantities and column heights.

(This section was not included as a major focus but Appendix B, the section on steel, brings attention to this concept in terms of steel weight implications of downstand reductions)

10.6 Concrete Strengths

Minimising concrete strengths, while balancing the impacts of reinforcing steel, should be seen as another key gateway decision when utilising concrete on a project. Using less cement should be the first port of call for minimising concrete emissions (once form is fixed) and current industry norms appear to lean towards over-specifying for a variety of non-technical reasons (as noted within 'Reducing the embodied carbon of concrete-framed buildings through improved Design and Specification' by Kanavaris et al, 2024). One of the biggest 'savings' in concrete specification comes simply from dropping down strength grades and reducing the minimum cement contents – an action that needs to be considered before low-carbon mix designs are discussed.

(This section was not directly included)

10.7 Façade and WWR

As outlined previously in this report, glazed areas tend to have a higher embodied carbon (A1-C4) impact that a low-carbon solid façade – due primarily to the assumed mid-life replacement of the glass. As such, minimising the window-to-wall ratio (WWR), while balancing the needs to overheating, daylighting etc., is generally seen as an important action to facilitate a low-carbon building. This can been seen as analogous to reducing the grid in terms of reducing structural carbon. It should also be noted that due to the fact that the carbon associated with replacements sits outside the scope of Upfront Carbon, these impacts would not be so keenly noticed in upfront-only assessments (Upfront = A1-A5. Replacement = Module B4).

Lightweight solid facades are also seen as providing the best chance of a lower carbon façade due to a minimisation of material use (Carbon Footprint of Facades: Significance of Glass, Arup). In addition, their low mass implies limited knock-on effects on the structure, and by extension structural carbon. Heavier systems, like precast concrete, may require edge beams or, at least, slightly larger foundations.

However, lightweight façade systems tend to rely on aluminium sub-frames – aluminium being a high-carbon material – which can cause large variation in upfront carbon depending on the complexity of the façade form, and thus the complexity and mass of the subframe. As such, we recommend that at early-stages, projects should aim to study lightweight facades systems, coupled with simplified, lean façade forms.

(This section partially dealt with in Section 3.6.3)

Appendix 2
Review of differences between the WCC upfront embodied carbon requirements and the UK Net Zero Carbon Buildings Standard

The table below provide clarity on the differences between the UKNZCBS and WCC approaches. Further information on the work between the two organisations is detail in the Statement of Common Ground between Westminster City Council and Net Zero Carbon Buildings Standard Limited (see SCG_015).

UKNZCBS 'limits'	WCC 'aspirational requirements' and 'limits'	WCC analysis and reasoning for why the same approach was not adopted
Different limits for New Buildings and Retrofits	Same requirements for New Buildings and Retrofits	WCC have set one requirement, with the intention being that through greater building retention, retrofit schemes will meet the requirements more easily which will further encourage retrofitting – which is the intention of the policy. It is hoped that through improved data availability arising from the introduction of the Retrofit First policy that there will be opportunities to investigate the potential for different targets in the future to align with the approach taken by the UKNZCBS.
Limits set as minimum value that shall be met	Upfront embodied carbon requirements given as a 'band' with a set aspirational requirement and limit	The Regulation 19 version of the policy used LETI bandings. To mimic the LETI bandings, the numerical values proposed to replace the LETI have been given as upper and lower limits.
Limits set for individual building uses	Requirements set for commercial and residential schemes (including hotels). All other uses to lower upfront embodied carbon as much as possible.	The Regulation 19 version of the policy used LETI bandings which were assigned to non-residential and residential schemes. This has been updated, but still reflects this broad categorisation as 'commercial' and 'residential' proposals, with hotels also added in with residential schemes based on a review of the performance of hotels across London (as submitted to the GLA). Given the specialist nature of other uses such as public infrastructure, and the limited London-specific data on these from a Whole Life Carbon perspective, these have been excluded from the upfront embodied carbon requirements at this time, however Whole Life Carbon Assessments will still be required and opportunities to reduce embodied wherever possible will still be required by these types of schemes.
Limits change per year (2025 to 2050)	Aspirational requirements and limits are set, without any change per year	Given the global nature of construction materials, it can be difficult to verify current data to create projections for material decarbonisation over the remainder of the City Plan period (to 2040). Therefore, whilst the council agree that an approach which decreases the

		requirements each year is warranted, the council have not been able to establish Westminster-specific requirements per year at this time. However, this is something which future reviews of the City Plan will consider to align with the approach taken by the UKNZCBS, and to effectively promote requirements which are aligned to limiting the extent of global warming to the 1.5 degree trajectory.
Aligned to science-based net-zero targets	Not currently aligned to net-zero targets of Westminster	Similar to the response outlined above, it is not currently possible (due to the reliability of local level data) to climate align the embodied carbon requirements specific to Westminster. This is something the council will look to do in the future.
Limits set based on a review of projects across the UK	Requirements set based on a review of projects across London	Whilst the detailed review of projects across the UK is supported, it is noted that the heavily built-up nature of Westminster is quite different than other areas across the UK. As such, data on Whole Life Carbon Assessments as submitted to the GLA were reviewed. These were complemented by a review of projects as submitted to WCC, along with a bespoke evidence report prepared by WSP which focussed on common building typologies in Westminster.
Demolition – included in limits	Demolition – not included in requirements	Demolition will vary for each site, which makes setting carbon requirements on this element of development difficult. Whilst not included within the upfront embodied carbon requirements, other parts of policy will comprehensively cover the requirements to justify demolition, and the policy guidance will also cover requirements to recover materials in a high value state which is the priority where demolition occurs. Furthermore, the Whole Life Carbon Assessments required by the Retrofit First policy will mean that this will still need to be assessed and reported on, despite not being included within the upfront embodied carbon requirements set by the policy.
Office limits given for Shell + Core, and Shell + Core + Cat A + Cat B 'Whole Building'	Commercial requirements applied to Shell + Core + Cat A	Whilst the UKNZCBS includes two different types of categories for office developments, it was thought that just one form would be most suitable for use in the policy to ensure consistent interpretation of the requirements. The Retrofit First Policy Guidance Document provides further information on how this should be dealt with in Whole Life Carbon Assessments. The upfront embodied carbon requirements are presumed (for commercial developments) to be Shell + Core, plus Cat A fit-out. This excludes Cat B fit-out given the fact that planning decisions are unable to influence this building element.

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