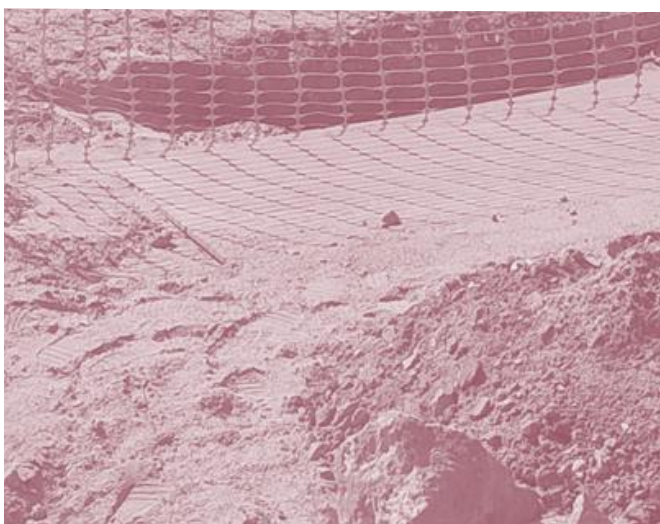
July 2025 – Draft

CaPU Climate and Planning Unit

Planning Policy Position for

Lower Embodied Carbon

Homes and Buildings in Greater Essex



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Essex Planning Officers Association

This draft Policy Position has been prepared collaboratively with officers from the Greater Essex Local Authorities and is based on the recommendations of the Essex Embodied Carbon Policy Study. Once finalised, the policy will replace the 'Placeholder' policy set out in the Planning Policy Position for Net Zero Carbon Development Homes and Buildings in Greater Essex (Nov 2023).

The Position Paper will be updated in Autumn 2025.

Please send any comments on the draft policy by 31st August 2025 to: climateplanningunit@essex.gov.uk

Please Reference – "NZ2 – Feedback – Name/Representing"

Embodied Carbon Planning Policy Position

POLICY NZ2: MINIMISING EMBODIED CARBON EMISSIONS FROM NEW DEVELOPMENT

All development proposals must demonstrate the measures taken to minimise embodied carbon (subject to meeting Policy NZ1[1] requirements first) and how circular economy principles have been embedded into the design. In doing so:

1. Re-using, renovating or retrofitting existing buildings and/or structures should be prioritised on a site. Any demolition must be justified to the satisfaction of the Local Planning Authority.

2. Proposals for all new residential and non-residential development (including extensions, renovations and conversions of existing buildings) must demonstrate that upfront embodied carbon* has been considered and reduced as far as possible through lean design, sustainable material procurement and waste minimisation.

3. New major developments, major renovation and rebuild developments are required to achieve the following set limits for upfront embodied carbon. This must be demonstrated through an embodied carbon assessment using a RICS and/or nationally recognised methodology which should be submitted at the same time as the full or reserved matters planning application (and with the outline planning application for schemes of over 100 dwellings):

    a. Low rise residential (up to 11m): ≤500 kgCO2e/m2 (GIA**) or subsequent update;

    b. Mid and high rise residential (over 11m) - ≤500 kgCO2e/m2 (GIA) or follow NZCBS*** limits when available;

    c. Non-domestic buildings: offices ≤600 kgCO2e/m2 (GIA); education ≤500 kgCO2e/m2 (GIA); and retail ≤550 kgCO2e/m2 (GIA) or follow NZCBS limits when available; and;

    d. For building services, meet the global warming potential refrigerant limits set out in NZCBS.

** Upfront Embodied Carbon = emissions associated with the Building Life Cycle Stages A1-A5 and RIBA stages 2/3, 4 and 6)*

*** GIA = Gross internal floor area*

**** NZCBS = UK Net Zero Carbon Building Standards (pilot launched September 2024).*

[1] Policy NZ1: Net Zero Carbon Development (in operation) – available here: www.essexdesignguide.co.uk/media/2954/net-zero-carbon-planning-policy-for-greater-essex-november-2023.pdf

Supporting Text / Reasoned Justification: Policy NZ2

The UK building construction industry is responsible for approximately 49% of total UK carbon emissions (Page 10, EECPS[2]). The whole life carbon emissions associated with buildings comes from the operational energy consumption in the day to day running of the building and emissions that result from embodied carbon in the construction process, maintenance and demolition of the building. Annually, embodied carbon emissions from the construction industry contribute 40-50 million tonnes of CO2, which is more than aviation and shipping combined (UKGBC, 2021[3]).

Embodied carbon accounts for a significant proportion, between 40 and 70% (Page 10, EECPS) of a building's whole life carbon and therefore addressing embodied carbon is important to meet local and national climate targets. Currently, embodied carbon is not covered by Building Regulations and there is no Government policy as yet requiring the assessment or control of embodied carbon emissions from buildings. The Environmental Audit Committee[4] (EAC) reported to Parliament in 2022 on this issue. The EAC highlighted that due to the lack Government Policy, no progress has been made in reducing these emissions within the built environment. They advise that the UK is slipping behind comparator countries in Europe in monitoring and controlling the embodied carbon in construction and if this continues the UK will not meet 'net zero' or its carbon budgets.

Local planning authorities are beginning to fill this gap in national policy and regulation by using their powers through the planning system to tackle embodied carbon emissions arising from new developments. They are mandating assessments and setting targets to steer development towards minimising carbon emissions. The EAC reported that evidence so far shows that policies are achievable and are being implemented, with few barriers to introduction (EAC Report, Paragraph 73). The EAC encourages local authorities to include a requirement for embodied carbon assessments in their Local Plans ahead of the introduction of national planning requirements.

In Essex, policies are already adopted and in place which are relevant to reducing embodied carbon emissions from new developments. These are Policy 11 of the Essex Waste Local Plan, which seeks to reduce the impact from waste management activities to climate change, whilst adapting to its potential effects, Policy 12 concerns transport and access, and seeks to minimise the impact of transporting waste, and Policy S4 of the Essex Minerals Local Plan, which seeks to ensure mineral waste is minimised and minerals on development/redevelopment sites are re-used and recycled. Furthermore, this policy framework is supplemented in some areas

[2] EECPS – Essex Embodied Carbon Policy Study, June 2024, Levitt Bernstein et al. https://www.essexdesignguide.co.uk/media/2981/essex-embodied-carbon-policy-study-technical-evidence-june-2024.pdf

[3] UK Green Building Council 'Net Zero Whole Life Carbon Roadmap' technical report (2021)

[4] Building to net zero: costing carbon in construction: Government Response to the Committee's First Report - Environmental Audit Committee (parliament.uk)

where district Local Plans include policies that focus on aspects of embodied carbon in new development, such as resource efficiency.

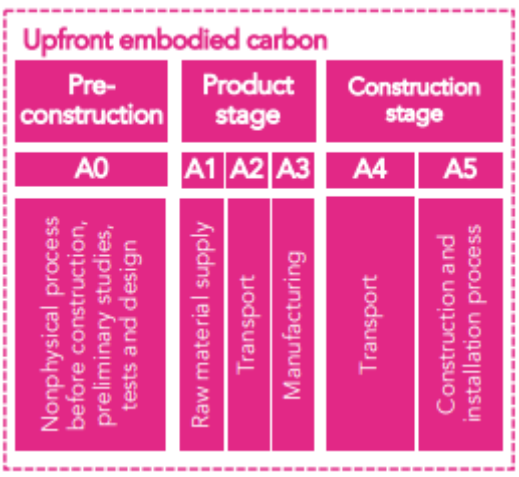
However, there is still a way to go before embodied carbon from new development proposals is fully assessed, considered and steps taken to reduce radically these emissions. Therefore, in response to the work of the Essex Climate Action Commission, Essex County Council on behalf of the Essex Local Authorities, commissioned an evidence study to support the development of an embodied carbon planning policy approach for Greater Essex that can be recommended to be embedded into district Local Plans.

The Essex Embodied Carbon Policy Study (EECPS) was completed in June 2024 and underpins Policy NZ2. The Study is available on the Net Zero Evidence Page of the Essex Design Guide and provides the technical feasibility, cost analysis and practical design guidance, to support the policy requirements.

Policy NZ2 and supporting evidence has been prepared to align carefully with Policy NZ1 on net zero carbon in operation. Both policies work together, and to be clear, Policy NZ1 requirements should be met first, and then measures to minimise embodied carbon should be taken in accordance with Policy NZ2. This is to prevent operational carbon being 'played off' against embodied carbon and provides a clear steer on what is expected from new development proposals.

Policy NZ2 introduces a requirement for all new build developments (residential and non-residential) to demonstrate the measures taken to minimise upfront embodied

UPFRONT EMBODIED CARBON REFERS TO THE GREENHOUSE GAS EMISSIONS ASSOCIATED WITH MATERIAL AND CONSTRUCTION STAGES: RAW MATERIAL SUPPLY, MANUFACTURE, TRANSPORT AND CONSTRUCTION OF ALL BUILDING ELEMENTS (PAGE 16, EECPS 2024).



The difference between linear and circular economy (Source: Circular Flanders).

THE POLICY FOCUSES ON UPFRONT EMBODIED CARBON EMISSIONS AS THESE ARE MORE UNDER THE CONTROL OF THE DEVELOPER AND WILL WORK TOWARDS REDUCING WHOLE LIFE CARBON EMISSIONS.

carbon and to embed circular economy[5] principles into the design. Guidance on how to do this can be found in the EECPS which presents 'set menus' for three residential typologies. The set menus compare a low carbon scenario with a high carbon scenario 'and one where both cost and carbon is optimised. The EECPS shows that reducing carbon can often be achieved at little or no impact on capital costs through good decision-making at design stage and materials choices.

[5] A Circular Economy (CE) is an alternative to a traditional linear economy (make, use and dispose) in which we:
1. Keep resources in use for as long as possible;
2. Extract the maximum value from them while in use;
3. Then recover and regenerate products and materials at the end of each service life. (Source: LETI)

Clause 1 – Presumption against demolition and promoting circular economy

Clause 1 applies to situations where demolition forms part of the planning application. The clause seeks to ensure that appropriate consideration is given to proposals that result in the substantial and total demolition of existing buildings by requiring justification to be provided. The aim is to ensure that consideration is given to the re-use of existing buildings and their materials, so they are not automatically demolished and disposed of without further considered thought as to their potential re-use, on or as near to the site as is feasible. Applicants will need to evaluate the feasibility and viability of refurbishment before considering substantial or total demolition and will need to carefully consider whether all or parts of the building could be retained and where demolition is justified, ensure that materials are re-used as far as practicable.

Demolition will be deemed acceptable to the Local Planning Authority (LPA) if it is accompanied by robust justification. The LPA may seek expert advice to help reach a judgement on the information provided to justify demolition.

The information that should be included as part of any justification by the applicant should include as a minimum:

- The use of the existing building, how long it has been in this use, its age, and the purpose of the new building; and whether this constitutes a change of use.
- How much demolition is proposed:
  - Percentage of envelope and structure to be retained by area?
  - Percentage of internals to be retained by area?
- Justification of substantial or total demolition by building layer (skin/shell, structure/frame, building services, and space plan/interior).
- Explanation and evidence for why the existing building cannot be retained. This should go beyond saying a building is 'low quality' or 'not fit for purpose' and include an assessment of:
  - Structural condition - by means of a structural engineer's report
  - Materials from which it is constructed
  - Contamination (e.g. asbestos)
  - Visual/importance of the architecture in streetscape/location
- Whether the development will deliver significant public benefits which could not be delivered through a retrofitting option;
  - Are there bespoke operational requirements which could not be provided through the repurposing, adaptation and/or extension of the existing building(s)?
- Service life/maintenance of fabric and systems – by means of an architectural and building services report.

In cases where the justification is considered weak or unclear, additional information may be required by the LPA, for example, for major developments, a pre-demolition and reclamation audit and a report of where materials are to be used on and off site. Further advice and guidance can be found at pages 51-53 of the EECPS and supplementary planning guidance will be prepared in due course.

Clause 2 – Lean building design and good material efficiency

The clause applies to all new residential and non-residential development, (including extensions, renovations and conversions of existing buildings) and seeks to ensure that resource use is reduced by creating a building that is efficient in its material use, form and design. For example, the sub and superstructure of a building should be optimised through 'lean design'[6], the building form does not result in excess structure and material use, and material choices represent the lowest upfront embodied carbon options. Designing for deconstruction and a circular economy is important too, particularly for temporary buildings.

As per Policy NZ1, 'residential buildings' means dwellinghouses and flats (C3), houses in multiple occupation (C4), and developments of self-contained residential units such as extra-care (C3). This also includes the residential element of any new mixed-use buildings. Non-residential buildings include Use Classes C1 (Hotels), C2 /C2A (Residential Institutions) and those falling within use classes B, E, F and Sui Generis. For any other residential and non-residential buildings, the policy should be applied in a proportionate manner where relevant and appropriate through the Development Management process.

To demonstrate compliance with the clause, applicants are expected to submit an 'embodied carbon statement' setting out the efforts made to reduce upfront embodied carbon; for major development this would form part of the embodied carbon assessment. This should include:

- A summary of the steps taken to design a lean, low carbon structure and building design. This will take into account efficiency of material use as well as types of material used. Applicants should justify where large volumes of material are proposed to be used due to specific design features (such as basements, podiums, large cantilevers).
- A calculation of the building form factor (exposed external surface area/gross internal floor area).
- An elemental analysis of the upfront embodied carbon (kgCO2e/m2) associated with three external wall options and two superstructure options; and include justification for the selected wall and structure type.
- A summary of steps taken to design for a circular economy

The EECPS (page 55) provides further advice and it is anticipated that supplementary guidance will be prepared in due course, including a 'light touch' template for the embodied carbon statement for minor developments to use.

[6] https://www.istructe.org/IStructE/media/Public/TSE-Archive/2020/Lean-design-10-things-to-do-now.pdf

Clause 3 – Limiting upfront embodied carbon and refrigerant emissions

The clause applies to all major development[7] proposals (including major renovation and rebuild developments[8]) and requires the assessment of upfront embodied carbon emissions (and building services refrigerant emissions) and introduces a limit for upfront embodied carbon for different development types. This will ensure that emissions have been reduced through efficient material use, material selection and design strategies.

The technical evidence presented in the EECPS (Section 8, Pages 69 - 125) demonstrates through detailed modelling of a typical net zero operational home for three low rise common residential typologies how both Policy NZ1 and the limits set in Policy NZ2 can be achieved. Different combinations of options (for example covering materials, building elements, and then 'set menus' per building typology) were modelled for embodied carbon and potential capital cost, including a 'balanced option' which optimises cost effectiveness with carbon reduction. This option can be achieved at a marginal cost uplift.

However, the evidence also demonstrates that a typical net zero operational home (i.e. one that meets Policy NZ1) that uses commonly specified construction materials can achieve the limit set in Policy NZ2 at zero cost uplift. Whilst the target is achievable on a cost neutral basis without necessarily considering steps to reduce embodied carbon emissions, the purpose of setting the target at the level selected is to achieve better building performance in terms of embodied carbon without excluding specific materials or home designs.

The EECPS builds upon and refers to evidence collated elsewhere, for example, for Westminster City Council and the West of England Combined and Unitary Authorities. These studies also demonstrate that significant reductions in embodied carbon emissions are achievable in new buildings at little or no cost (Page 119, EECPS).

The Study draws upon the work of Low Energy Transformation Initiative (LETI) and the Royal Institute of British Architects (RIBA) in setting limits for mid and high rise residential buildings and non-residential buildings, and the limits set in the policy align with the LETI Band C[9]. The work of the UK Net Zero Carbon Building Standard (UKNZCBS) Initiative is referenced in the policy and a pilot version of the UKNZCBS[10]

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[7] as defined in the Town and Country Planning (Development Management Procedure Order 2010 – as amended. For housing development major development is where 10 or more homes will be provided, or the site has an area of 0.5 hectares or more, and for Non-residential development - an additional floorspace of 1,000m2 or more, or a site of 1 hectare or more.

[8] Major renovation means a deep retrofit of a major development (as defined in footnote 6 above), and deep retrofit means that it impacts the material structure of the building.

[9] *Source:* LETI Embodied Carbon Target Alignment document

[10] Pilot Version | UK Net Zero Carbon Buildings Standard (nzcbuildings.co.uk)

has been released. When the final version of the Standard is published then this may be used in place of the limits identified in Policy NZ2 for upfront embodied carbon.

The limits for upfront embodied carbon identified in the policy, including for low rise residential, have been set at a practicable level because it has the advantage of ensuring there is some consideration of building form, typology and material selection, without seeking to exclude specific materials or designs. This is considered an appropriate first step whilst the industry comes to adopt the methodology as part of their own processes.

The advantage of the policy approach ensures that current good practice in relation to embodied carbon reduction becomes more common and conversely poor practice is eliminated. Further explanation of the considerations given to setting the limit in the policy is provided in Page 120 of the EECPS.

Reporting and Monitoring Policy Compliance

The assessment and reporting of embodied carbon for the purposes of compliance with Policy NZ2 should follow a nationally recognised methodology. Until there is a recognised and adopted UK national methodology, the RICS Professional Statement on Whole Life Carbon Assessment (WLC) is the accepted industry methodology for WLC assessments (EAC Report, Para 70) and should be used for demonstrating policy compliance until a national methodology is in place. Further useful software tools have also been developed, such as one click LCA[11].

Policy compliance for major development will need to be demonstrated through the submission of an Embodied Carbon Assessment. The Section 7 (Pages 60-68) of the EECPS sets out reporting requirements, information checklists and templates (which are extracts from the RICS guidance) which should be included in a statement. Also, the Study (at page 56 EECPS) provides additional guidance on the type of information to provide, for example reporting on high carbon materials and circular economy metrics, and the global warming potential of refrigerants used in building services.

For minor development, policy compliance should be demonstrated through the provision of an embodied carbon statement which can follow the template under preparation and which will be available to download from the Essex Design Guide.

As a minimum the following indicators will be monitored on major development proposals:

If the development involves demolition, has this been adequately justified? (Clause 1)

Has upfront embodied carbon been reduced through good design and material efficiency? (Clause 2)

Have the limits for upfront embodied carbon been met for all major building types? (clause 3):

has this been demonstrated through an Embodied Carbon Assessment using the RICS (WLCA PS V2 2023 or later version) or nationally recognised methodology?

Have the top five highest emitting materials been reported together with circular economy metrics and disclosure on unusually low embodied carbon material data?

Have embodied carbon calculations for refrigerants been carried out using CIBSE TM65 methodology?

Have the NZCBS limits for global warming potential refrigerants been met? (Clause 3d)

[11] https://www.oneclicklca.com/

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Please get in touch with your feedback

Contact us

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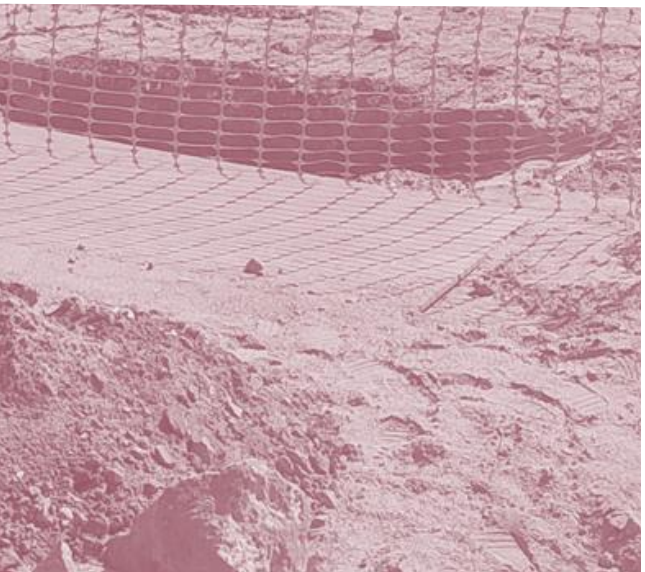
Website

www.essexdesignguide.co.uk/climatechange



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