

Draft Canterbury District Local Plan 2040
Regulation 18 Consultation 2024

CLIMATE CHANGE TOPIC PAPER

(FEBRUARY 2024)

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1. Executive summary

- 1.1 Canterbury City Council's Climate Change Action Plan (CCAP) was adopted in May 2021 following development of the plan in 2020 and public consultation in early 2021. The plan lists actions to mobilise activity to reduce the causes of climate change and carbon emissions (which is a common synonym for greenhouse gas emissions of which carbon dioxide is a major component), across council activities and responsibilities.
- 1.2 A key action within the CCAP was to make climate action a priority in the revised Local Plan 2021-2045 (now 2040) which prioritises measures to reduce district emissions and create climate resilience. A number of policies have been developed within the draft local plan to support this action.
- 1.3 Canterbury City Council published a Draft Canterbury District Local Plan to 2045 that went out to public consultation in October 2022. The causes and consequences of climate change are central issues to the development of the plan. Actions to reduce carbon emissions and adapt to the changing climate and its impacts are necessary in all aspects of development and this is reflected in the proposed policies.
- 1.4 Following the consultation, a new council was elected in May 2023 and a new Cabinet formed. It decided the draft local plan would be revised. In relation to Policy DS6 - Sustainable Design, feedback was largely supportive, with residents, councillors and organisations wanting to push the ambitions further. General feedback from developers was that more evidence was required to ensure the operational net zero requirements proposed are achievable. There was also feedback that more detailed guidance, potentially in the form of a Supplementary Planning Document (SPD) was required to understand and contextualise how the policy would be implemented. Therefore, an initial draft version of the Sustainable Design Guide SPD has been developed and published alongside the revised draft local plan for consultation.
- 1.5 The approach to the transport plan has changed since the previous iteration of the Draft Canterbury District Local Plan. The new Draft Canterbury District Local Plan to 2040 includes a transport strategy that is bus led. Modal shift will be encouraged and facilitated in the district to encourage residents out of private cars and onto public transport or methods of active travel.
- 1.6 This report summarises evidence from the most up-to-date and relevant sources to inform the council's climate change policies. It also sets out how the new draft local plan will positively influence the ability of the district to reduce carbon emissions in a timely way.
- 1.7 The scale of change required to meet UK carbon budgets in the energy, buildings and transport sectors is very large and requires significant intervention from national, regional and local governments to enable the changes. Local planning policies in the new local plan must play a major part in ensuring new development meets these challenges and opportunities head-on.
- 1.8 This evaluation of the development emissions finds policies to reduce operational emissions from new development have the potential to reduce the cumulative carbon emissions from the plan by approximately 230,000 tonnes CO₂e.
- 1.9 At the same time, development must take every opportunity to reduce the risk of direct and indirect climate change impacts. However, the policies within the local plan on their own will not be enough to meet carbon reduction targets or comprehensively adapt to the changing climate

and the council is also working on a wide programme of climate change action. This programme of work includes projects to reduce carbon emissions from the council's assets and services, assisting and advising businesses and residents in the district, investing in infrastructure to enable electric vehicle transition and continuing the ongoing work to manage coastal and inland flood defences.

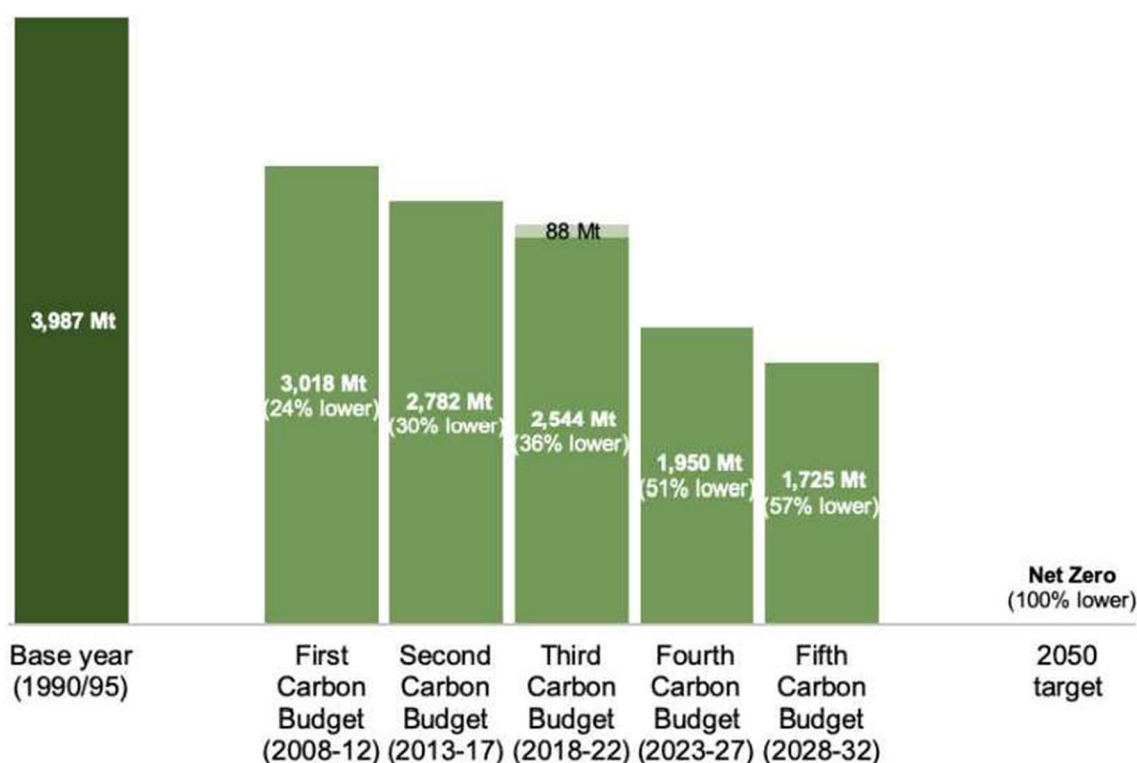
- 1.10 A written ministerial statement was published on 13 December 2023, Planning - Local Energy Efficiency Standards Update. Within the statement it was announced that from 2025, new tighter standards were planned for new residential development. This requires new homes to be “net zero ready” ie once the grid is decarbonised, a home will be truly net zero. Any planning policies that exceed this requirement must ensure development remains viable and they must express the additional requirement as a percentage uplift of a dwelling’s Target Emissions Rate (TER) calculated using a specified version of the Standard Assessment Procedure (SAP).
- 1.11 In 2022 a viability study was published with the first new iteration of the local plan. The study was undertaken by HDH Planning & Development on behalf of Canterbury City Council. Table 8.9 assessed the costs of on-site reduction of carbon emissions for regulated and un-regulated carbon. It’s important to note that these costs were calculated before recent changes to requirements of new buildings as mentioned in paragraph 1.10. The new improved requirements mean that gas boilers are no longer the default source of heating and air source heat pumps should be used in the first instance from 2025.

2. Key climate change policies within the Local Plan to 2040

- 2.1 The policies that will have the most significant effect on reducing carbon emissions from activities within Canterbury District are:
 - DS6 Sustainable Design: net zero operational carbon emissions standards for new developments
 - DS6 Sustainable Design: whole-life carbon emissions assessments and reductions for new developments
 - DS14 Active and sustainable travel: reconfiguration of the transportation systems to enable a significant shift in journeys by foot, bicycle and bus, reducing journeys by individual private vehicles
 - DS25 Renewable energy and carbon sequestration: enabling and supporting rapid increase of renewable electricity generation of all types across the district to meet the zero carbon energy supply needs of the district
- 2.2 The policies that will have the most significant effect on adapting to the changing climate within Canterbury District are:
 - DS6 Sustainable Design: incorporating measures for resilience and adaptability to the effects of climate change at a building level, development site level and in relation of the development to the area
 - DS21 - Supporting biodiversity recovery: increasing biodiversity and green infrastructure as part of development design so that the natural environment is resilient to the changing climate and brings co-benefits for society

3. The climate change evidence supporting the policies

- 3.1 The 15-year period of time covered by the new draft Canterbury District Local Plan 2040 has been highlighted internationally as a critical moment in human history: acting on the causes of climate change is crucial to minimise the risk of long-term climate change instability and the worst impact of a changing climate. At the same time, parallel work to repair and restore resilient ecosystems and adapt to the changing climate must also be undertaken to reduce the impacts of climate and ecological change that are already underway.
- 3.2 The UK national context for reducing carbon emissions is set out in the carbon budgets of the Climate Change Act 2008:



Source: BEIS, UK Legislation.

- 3.3 There is a requirement under the legislation to reduce carbon emissions from 2022 levels by 33% by the 2028-32 fifth carbon budget period and then continue reductions to net zero. The National Planning Policy Framework paragraphs 157 to 164 state the planning system should support the transition to a low-carbon future in a changing climate, taking full account of flood risk and coastal change. It also states new development should be planned for in ways that avoid increased vulnerability to the range of impacts arising from climate change and can help to reduce greenhouse gas emissions, such as through its location, orientation and design.
- 3.4 The Kent and Medway Energy and Low Emissions Strategy and Canterbury City Council's commitments through UK:100 include setting area carbon budgets and tracking performance to achieve these targets. The population pro-rata carbon budget 2023-2045 for Canterbury District is approximately 7,000 kTCO₂e.

- 3.5 Achieving the carbon budgets requires rapid and wide scale reduction of carbon emissions from all sectors. Within the context of the local plan, key areas include building and consuming materials, heating and powering homes, transportation and energy production.

4. The future of buildings in Canterbury District

- 4.1 Analysis of different zero carbon pathways for Canterbury District shows buildings are one of the sectors which must target zero emissions. The Committee on Climate Change, the Anthesis SCATTER Cities model, evidence for the Kent and Medway Energy and Low Emissions Strategy and our own analysis all concur that:

- new buildings must be designed to achieve net zero carbon operational carbon emissions as soon as practicable
- opportunities to reduce carbon emissions from existing buildings should be taken when making modifications to remodel or extend them
- the embodied carbon in the materials and construction process of making and modifying buildings must be evaluated and minimised

In order to achieve this:

- new buildings built must be extremely energy efficient and have an ultra-low energy demand to heat and power the building
- where heat is required in new buildings it should be heated by low-carbon heat such as heat pumps
- there should be no gas boilers installed in new homes
- retrofitting existing buildings to improve energy efficiency and remove fossil fuel heating must be fully enabled through a variety of measures.

- 4.2 Alongside achieving net zero emissions, new buildings and modifications to existing buildings must incorporate measures to minimise climate change impacts from the hotter summers and heavier rainfall that will increase in frequency over the duration of the plan and beyond. In order to achieve this:

- measures to avoid overheating must be incorporated into designs
- drainage and runoff systems must be cater for projected heavy rainfall events to avoid surface water and drainage flooding to the building and impact on the locality

- 4.3 The Committee on Climate Change has published a report in 2019 named UK Housing - Fit For The Future?. The report highlights the need to build new buildings with 'ultra-low' levels of energy use and makes a specific reference to space heating demand and recommends a maximum primary energy target of 15-20 kWh/m²/yr for new dwellings. This is consistent with targets for heat energy requirements specified by the Passivhaus standard, LETI and RIBA Sustainable Outcomes. This target is consistent with achieving Energy Performance Certificate level A. The Greater London authorities have required major developments to achieve net zero operational carbon emissions since 2016; Whole Life Carbon assessments have been required since 2021.

- 4.4 The council has concluded future development in the district should be designed and built to be net zero carbon operational emissions and that whole life (embodied) carbon emissions be evaluated and minimised without delay. Responding to climate change was one of the key issues raised through the Issues consultation in 2020. We then consulted on these outline policies as part of the Options consultation in 2021 and the policies were supported by over 75% of respondents. Draft Policy SS3 makes provision for an average of 1,149 new dwellings over the

period of the Local Plan. To continue to design new developments with net positive carbon emissions simply adds to the already significant retrofit challenge of the future, delays progress on emissions reductions at a district level and passes the costs of retrofit onto the homeowner; costs that would be significantly less if implemented at the time of construction.

4.5 To support the Local Plan Policy DS6, a Supplementary Planning Document has been developed. The purpose of the document is to provide guidance to developers and housebuilders on how to comply with draft Policy DS6 and other relevant policies. The document is split into chapters that take the user through different aspects of the design process, ensuring net zero operational emissions is the aspired standard from the very first stages of design. The SPD also sets out the council's requirement for operational net zero. In line with the WMS of December 2023, to achieve operational net zero, a 100% improvement on the Target Emission Rate (TER) is required. This translates to a Dwelling Emission Rate (DER) of 0 or lower.

4.6 The current nationally recognised non-traded price of carbon in 2023 is as follows:

- Low series: £126 per tonne of CO₂
- Central series: £252 per tonne of CO₂
- High series: £373 per tonne of CO₂

This is according to The Green Book 2022 by the Department for Business, Energy & Industrial Strategy (BEIS). These updated values consider the previous value of £95 outdated reflecting UK's net zero commitments and withdrawal from the EU. The series outlined above represent different scenarios, reflecting varying levels of carbon reduction endeavours. The central series is often considered the most frequently used value for policy. More recently, the High price has been used for carbon offsetting by the likes of the GLA. Due to the more recent changes in the carbon factors in Part L 2021, the cost of offsetting any carbon shortfall at £95/tonne would become considerably cheaper for developers, which may encourage financial offsetting ahead of on-site mitigation. Canterbury has chosen to align with the "High" figure as per the BEIS Green Book. This figure is necessary to ensure that paying a carbon offset figure is higher than what it would cost to implement equivalent measures on-site.

4.7 Setting net zero operational energy standards for new development within the district has the potential to reduce carbon emissions by over 230ktCO₂e over the plan period. The evaluation of the emissions impact of building operational and embodied carbon emissions is set out in part 7.

4.8 The independent viability study for the Local Plan to 2040 (2022) has evaluated and factored in the costs of building new homes to net zero carbon standard and this is shown to be viable and deliverable alongside other policy costs, such as for affordable housing. To build net-zero carbon homes and buildings with immediate effect is consistent with the district, county and national carbon emissions reduction targets. By setting these standards now, it does not unnecessarily consume Canterbury District's remaining carbon budget and it is also consistent with the Climate Change Act 2008.

4.9 The south east of England has some of the lowest rainfall in the UK and is classed as a 'water stressed' area by the Environment Agency. South East Water's Water Resources Management Plan 2020 to 2080 sets out how the organisation plans to secure water supplies for the future. South East Water's target for water consumption is 90 litres per head per day by 2080. As set out earlier in this topic paper, the next 23 year period of time has been highlighted internationally as a critical time to act to minimise the risk of long-term climate change instability and the worst

impact of a changing climate. It has also been considered that existing development in the district may not have the design capabilities required to reach government water consumption targets of 110 litres per head per day. For these reasons, new developments will be required to go beyond this target.

5. The future of movement and transport in Canterbury District

- 5.1 According to UK local authority and regional greenhouse gas emissions national statistics 2022, emissions from road transport are a major component of the greenhouse gas emissions in Canterbury district, producing around 40% of the emissions from energy, predominantly from the combustion of petrol and diesel fuelled vehicles. Reducing emissions from road transport is a key component of reducing the causes of climate change in the UK Government plans and the Kent and Medway Energy and Low Emissions Strategy.
- 5.2 The evidence base from the Committee on Climate Change, Kent and Medway Energy and Low Emissions Strategy and Department for Transport show major transformation of the movement of people and goods is necessary to meet net zero carbon emissions goals. The strategies in the evidence base to do this include:
- fleet mix transformation to zero emissions vehicles as rapidly as possible
 - a major shift away to active travel away from vehicles for short and local journeys
 - a significant increase in vehicle use efficiency through higher occupancy rates, shared modes of travel and public transport
 - smarter and more efficient ways of working and distribution of goods
- 5.3 The spatial planning and transport infrastructure in the new proposed draft local plan include an ambitious plan to change movement and transport patterns and modes in Canterbury with a bus-led plan. The vision of the Canterbury City Council Bus Strategy is for the bus to be a key pillar of our local transport network: a transport option that is reliable, affordable, accessible, safe, integrated and which supports new evolving travel patterns. There are multiple co-benefits to the plans' proposals for reducing emissions, improving air quality, reducing congestion, improving walking and cycling connectivity, and making quieter and safer neighbourhoods.
- 5.4 The Transport for the South East Decarbonisation Pathways Report (Version 3.0 September 2022) provides an analysis of the carbon emissions reductions possible from different interventions. The analysis finds the main factors in defining a pathway to net zero carbon are interventions to reduce the number of trips we make, shift the mode of travel used to zero emission modes and to reduce vehicle emissions to zero. The report concludes: "For all involved in the planning and delivery of interventions, this includes doing so with great urgency and to a significant or full extent - perhaps the likes of which we have never seen before."
- 5.5 Further traffic modelling work is now underway and, when completed, this will be used to assess the carbon implications of the draft Transport Strategy.
- 5.6 Further policies and interventions in addition to those presented in the local plan have been explored to progressively reduce transport carbon emissions further, such as requirements for EV charging infrastructure and cycle storage for new development.

6. The future of energy in Canterbury District

- 6.1 In order to achieve the objectives of reducing district carbon emissions and providing the renewable power to enable the switch away from fossil fuels, the new draft local plan 2040 needs to provide clear direction and policy for the provision of sufficient renewable energy generation in the district. The evidence supporting the Kent and Medway Energy and Low Emissions Strategy says, in order to achieve power decarbonisation goals, successful pathways include:
- more than 50% additional offshore wind generation
 - multiple onshore wind generation developments of a range of sizes
 - much more rapid deployment of rooftop solar electricity and heat generation
 - continued development of community and utility scale solar electricity installations
- Other renewable energy infrastructure including biomass, biogas and hydro power installations may also have a small role to play.
- 6.2 Although the development of renewable energy generation within Canterbury District up to 2023 has been above average across Kent, it has not been delivered at the scale and pace required to provide a replacement power source for fossil fuelled heating and transport.
- 6.3 The local plan therefore includes policies that encourage suitable proposals of all types of renewable and low-carbon energy generation and associated infrastructure within the district.
- 6.4 As part of the previous iteration of the draft local plan development process, there was a specific call for sites where opportunities for renewable energy generation were put forward by landowners and developers. These sites were assessed in 2022 and, following this assessment, the draft Canterbury District Local Plan 2040 includes specific policies for renewable energy proposals. In considering future proposals, the council will give significant weight to the carbon emissions reduction and energy resilience that the projects can deliver.
- 6.5 Submitted sites reviewed can be viewed in the 2022 iteration of the Climate Change Topic Paper.

7. Technical review of carbon emissions (greenhouse gas emissions) associated with draft Local Plan development (buildings only)

7.1 Summary

The greenhouse gas emissions (also referred to as carbon emissions) generated by constructing (embodied emissions) and operating (operational emissions) new development and infrastructure are significant contributors to the district's overall carbon footprint.

This evaluation calculates the projected greenhouse gas emissions from the development proposed (buildings only) for the Canterbury District Local Plan 2040 and finds that:

- the emissions generated from residential construction are the largest proportion of the development emissions
- the cumulative greenhouse gas emissions through to 2040 from new development can be reduced by approximately 45% by introducing operational net zero standards for new development by setting high energy efficiency standards now, and
- this will have a benefit beyond 2040

Recommendations based on review:

- implementing policy for planned developments to evaluate and reduce the whole life (embodied) carbon emissions from the materials and construction process of new buildings
- to maintain a register of embodied carbon emissions from approved and completed developments
- the local plan to set net zero operational emissions standards for new development in the district in line with the Written Ministerial Statement (2023)

7.2 Development carbon emissions basis

Table 7.2.1: Local Plan 2040 high level development summary for building emissions evaluation

Committed new residential development (no. dwellings)	Additional planned residential development (no. dwellings)	Committed new commercial development (m2)	Additional planned commercial development (m2)
10,212	11,073	99,065	111,145

7.3 Emissions factors

The following emissions factors have been used for the evaluation:

Table 7.3.1: Emissions factors for construction of buildings and operation of buildings

Activity	Emissions factor	Source	Notes
Embodied emissions (domestic) Emissions from constructing a typical brick UK home (including groundworks and local infrastructure)	42.5 tonnes CO ₂ e for the average UK house of 85m ² usable floor area 800 kgCO ₂ e/m ² is the RIBA target value for 2025	Atkins / RICS / CITU	Typical range 500-1000 kgCO ₂ e/m ² during the construction process (Atkins/RICS) for all 1-3 storey housing types. Note that apartments and more than 3 storeys have higher embodied emissions. Includes the groundworks and local infrastructure for the development.
Operational emissions (domestic) Emissions from heating and powering homes	2.4 tonnes CO ₂ e per year (for typical current new build home EPC B) (28 kgCO ₂ e/m ² /y)	Domesticenergy.gov.uk + UK EPC Register on epc.open data communities	The emissions from running gas central heating and the electricity to power the home. This is equivalent to a typical 85m ² home of EPC efficiency
Embodied emissions (non-domestic)	970 kgCO ₂ e/m ² is the RIBA target value for 2025	RICS /Atkins/ RIBA	Embodied emissions for non-domestic buildings vary widely from low for light industrial shed type

Activity	Emissions factor	Source	Notes
			to high for multiple storey office or hotel construction
Operational emissions (non-domestic)	10- 20 kgCO ₂ efm ² .yr	Commercial EPCs at level A performance (2020)	Commercial EPCs based on metered usage and 2020 UK greenhouse gas emissions factors for gas and electricity

These emissions factors are based on the best available evidence; the level of accuracy is likely to be ±25% and the estimated emissions values should therefore be used as guidance only in the relative impacts between options.

7.4 Assumptions

The following assumptions have been used for this evaluation:

Table 7.4.1: Model assumptions

Assumption	Notes
Energy systems change is consistent with current projections and evidence	Decarbonisation of the UK electricity supply continues and the grid capacity is expanded to meet the needs of transportation and heat decarbonisation in the South East. Fabric first building energy efficiency and a switch away from gas to meet carbon reduction goals are the key routes to reducing carbon emissions from buildings.
Rate of development is based on current view of projections	The rate of development used has been based on the current view of projections from 2026-2040 for both residential and an average has been applied for commercial development. The savings on operational emissions have only been applied to buildings which can be mitigated by the new policy where they have not yet been approved at planning.
Consistent size of residential developments	The average size of the developments is 90m ² / dwelling. This is based on the profile of houses and flats and bedroom sizes within the plan.

7.5 Evaluation of development carbon emissions

The evaluation of cumulative carbon emissions over the plan is only indicative because of the high level of assumptions and lack of detailed embodied carbon emissions data. However, the evaluation indicates that the policies within the draft Canterbury District Local Plan (2040) would reduce carbon emissions significantly over the lifetime of the plan.

The below table includes figures for committed and planned growth in the district for the delivery period of the new draft local plan. Carbon savings are derived from operational emissions on buildings that we are able to mitigate with the new net zero policy. Only buildings that have not yet been approved at planning can be mitigated by the policy.

Table 7.5.1

2040 estimated cumulative emissions summary	Not Mitigated	Mitigated
Residential construction emissions (tCO2e)	1,528,407	1,528,407
Residential operational emissions (tCO2e)	487,439	268,954
Commercial construction emissions (tCO2e)	203,904	203,904
Commercial operational emissions (tCO2e)	25,225	11,888
Total construction & operational emissions (tCO2e)	2,244,975	2,013,152
Total Operational emissions (tCO2e)	512,664	280,842

The analysis indicates that the draft policies would lead to a c45% reduction in operational carbon emissions from new development, equating to 231,823 tCO2e.