Climate Change and Sustainable Buildings Topic Paper

Planning is a technical process, driven by legislation and government policy and advice. This topic paper uses several technical terms, so the below definitions have been prepared to assist the reader.

The principal concepts for this topic paper are:

- **Net Zero Carbon** - A state where the amount of carbon emissions associated with a building or other system are zero or negative. For buildings, net zero carbon may be considered at the construction or operational phases, or over its whole lifecycle[1].
- **Climate Change Mitigation** - Action to reduce the impact of human activity on the climate system, primarily through reducing greenhouse gas emissions[2].
- **Climate Change Adaptation** - Adjustments made to natural or human systems in response to the actual or anticipated impacts of climate change, to mitigate harm or exploit beneficial opportunities[3].
- **Regulated and Unregulated Energy –** Regulated energy is 'controlled' by Part L of the Building Regulations (such as lighting, ventilation and heating space and water), whereas unregulated energy consumption is not 'controlled' by Building Regulations (such as that used by electrical appliances)[4].
- **Low Carbon Energy Supply** - Energy generated using non-fossil fuel sources[5].
- **Renewable Energy** - Energy generation technologies which use natural energy sources (such as solar and wind power) to generate electricity or power heating and/or cooling systems[6].
- **Carbon Offsetting** - Where a proposal cannot achieve a target carbon emissions level through interventions on site, carbon offsetting is the process of compensating for the

[1] UK Green Building Council (2019). Net Zero Carbon Buildings: A Framework Definition, p23. Available at: https://ukgbc.s3.eu-west-2.amazonaws.com/wp-content/uploads/2019/04/08140941/Net-Zero-Carbon-Buildings-A-framework-definition.pdf [Accessed on 24/03/23]

[2] MHCLG (2021). National Planning Policy Framework, p65. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf [Accessed on 24/03/23]

[3] MHCLG (2021). National Planning Policy Framework, p65. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf [Accessed on 24/03/23]

[4] CIBSE (2018) Unregulated energy – why we should care. Available at: https://www.cibsejournal.com/opinion/unregulated-energy-why-we-should-care/ [Accessed on 24/03/23]

[5] UK Green Building Council (2019) Net zero carbon: one-pager for new buildings. Available at: https://www.ukgbc.org/ukgbc-work/net-zero-carbon-one-pager-for-new-buildings/ [Accessed on 24/03/23]

[6] LETI (2020) LETI Climate Emergency Design Guide, p153. Available at: https://www.levittbernstein.co.uk/site/assets/files/3494/leti-climate-emergency-design-guide.pdf [Accessed on 24/03/23]

remaining carbon emissions balance by reducing emissions elsewhere or through financial contributions[7].

- **Operational Carbon** – Operational greenhouse gas emissions arising from all energy consumed by a building while in use over its lifecycle[8].
- **Embodied Carbon or Life Cycle Embodied Carbon** – Total greenhouse gas emissions and removals associated with the materials and construction processes through the whole life cycle of a building[9].
- **Whole Life Carbon Emissions** – Total greenhouse gas emissions and removals, including operational and embodied emissions over the lifecycle of a building, including its disposal[10].
- **Circular Economy** – In the context of development proposals, a circular economy approach treats building materials as resources rather than waste, and puts in place a clear hierarchy, prioritising the retention of existing structures above demolition, where this is the more sustainable and appropriate approach[11].

1. Background/ Context

1.1 Document overview

This draft paper explores possible approaches for the scope of policy in the Design and Sustainability Development Plan Document (DPD) in setting requirements on climate change and sustainable buildings.

The technical note is structured as follows:

- Background/ Context
- Legislative Requirements
- National Policy and Guidance
- Local Context
- Experience in other Authorities Elsewhere

[7] LETI (2020) LETI Climate Emergency Design Guide, p153. Available at: https://www.levittbernstein.co.uk/site/assets/files/3494/leti-climate-emergency-design-guide.pdf [Accessed on 24/03/23]

[8] WLCN, LETI, CIBSE, RIBA, RICS, IStructE, ICE, and UKGBC (2023) Carbon Definitions for the Built Environment, Buildings & Infrastructure, p5. Available at: https://www.leti.uk/_files/ugd/252d09_04f3e91a9a1a431b8dbaf35a0a1a81f3.pdf [Accessed on 24/03/23]

[9] WLCN, LETI, CIBSE, RIBA, RICS, IStructE, ICE, and UKGBC (2023) Carbon Definitions for the Built Environment, Buildings & Infrastructure, p5. Available at: https://www.leti.uk/_files/ugd/252d09_04f3e91a9a1a431b8dbaf35a0a1a81f3.pdf [Accessed on 24/03/23]

[10] WLCN, LETI, CIBSE, RIBA, RICS, IStructE, ICE, and UKGBC (2023) Carbon Definitions for the Built Environment, Buildings & Infrastructure, p5. Available at: https://www.leti.uk/_files/ugd/252d09_04f3e91a9a1a431b8dbaf35a0a1a81f3.pdf [Accessed on 24/03/23]

[11] Greater London Authority (2022) Circular Economy Statement Guidance. Available at: https://www.london.gov.uk/programmes-strategies/planning/implementing-london-plan/london-plan-guidance/circular-economy-statement-guidance#:~:text=View%20the%20document-,What%20is%20the%20Circular%20Economy%20Statement%20Guidance%3F,and%20adapted%20over%20their%20lifetime. [Accessed on 24/03/23]

- Discussion and Conclusions

1.2 Background

In 2018, the Intergovernmental Panel on Climate Change (IPCC) released a Special Report 15 (SR15)[12] which outlined advice that global temperature increases should be limited to below 1.5ºC and that action would be needed to reduce global greenhouse gas emissions by over half of their 1990 levels in just over a decade (by 2030). The targets are challenging, but the benefits are clear. Change now will help globally, halting rising global and sea temperature rise and preventing regular severe weather events. Locally, action responding to the challenge of climate change will benefit communities by avoiding flood damage costs, enhancing green spaces and improving air quality, lowering energy bills and reducing fuel poverty, and creating new jobs in the green economy.

Maidstone have committed to becoming as close to carbon neutral as possible by 2030. Carbon Neutrality (or 'Net Zero') can be achieved through reducing existing emissions and actively removing greenhouse gases. Maidstone have committed to achieving Net Zero for their own operations by 2030, with the long-term aspiration to become carbon negative or a footprint less than neutral. The latter aspiration would have the net effect of removing carbon dioxide from the atmosphere.

At a Borough-wide level, in accordance with national government targets and based on Tyndall Centre data, Maidstone have set out carbon reduction milestones to reduce CO_2 emissions by 13.4% each year across the Borough to reach near to Net Zero by 2041. The achievement of this target is contingent on many factors and not the sole responsibility of the Council due to the far-reaching behaviour change required across the private sector, transport sector, and communities. Effective collaboration will be essential for delivering the scale of change needed.

Maidstone's overall strategy for net zero is set out in its Biodiversity and Climate Change Action Plan.

2. Legislative Requirements

The national legislative context is underpinned by the Climate Change Act (2008)[13], which introduced a statutory target for the UK to reduce greenhouse gas emissions by 80% by 2050. This has since been updated in June 2019 under the Climate Change Act 2008 (2050 Target Amendment) Order[14] to a 100% reduction (or net zero) by 2050. The current legislation allows for a limited amount of greenhouse gas emissions to be addressed through offsetting to meet the net zero target, such as through removal of carbon from the atmosphere and/or trading in carbon units. The Climate Change Act places obligation on central Government (but not local Government) to prepare policies to meet these targets. In order to reach emissions targets, the Climate Change Act established carbon budgets within the UK. Carbon budgets are a cap on the amount of carbon which the country can produce, set in 5-year periods. This is a stepped target in which the budget gets

[12] IPCC (2018) Special Report 15 (SR15), 05/08/20. Available at: https://www.ipcc.ch/srccl/ [Accessed on 24/03/23]

[13] UK Government (2008) The Climate Change Act. Available at: https://www.legislation.gov.uk/ukpga/2008/27/contents [Accessed on 24/03/23]

[14] UK Government (2019) The Climate Change Act 2008 (2050 Target Amendment) Order 2019. Available at: https://www.legislation.gov.uk/ukpga/2008/27/contents [Accessed on 24/03/23]

progressively tighter. The UK has succeeded in meeting the first two budgets and is on track to meet the third budget set for 2018- 2022 (a 37% reduction).

In April 2021, the UK Government announced that it will set in law the world's most ambitious climate change target for its sixth Carbon Budget (2033 to 2037), cutting emissions by 78% by 2035 compared to 1990 levels. The figure aligns with the recommendation from the Climate Change Committee and will take the UK more than three-quarters of the way to reaching net zero by 2050. Notably, the emissions boundary for the sixth Carbon Budget has been expanded to include the UK's share of aviation and shipping emissions for the first time. The UK Government is legally obliged to assess and prepare for the impacts of climate change.

The Climate Change Act also sets out a framework for climate change adaptation. It requires the UK Government to produce a UK Climate Change Risk Assessment (CCRA) every five years, which assesses current and future risks and opportunities arising from climate change. In response to the CCRA, the Government must produce a National Adaptation Programme (NAP) detailing the actions that Government and others will take to adapt to the challenges posed by climate change. The NAP recognises that there are synergies between taking adaptive action and mitigating climate change, and that these should be sought out wherever possible. For example, maintaining high quality natural environments can reduce the severity of heatwaves, while also sequestering carbon from the atmosphere.

The UK's climate change commitments have been reflected within planning legislation to enable plan-making and planning decisions to help achieve these commitments. For local planning, the UK climate commitments are reflected in The Planning Act (2008) and the Planning and Compulsory Purchase Act (2004).

This includes Section 182 of the Planning Act 2008 which places a legal duty on Local Planning Authorities (LPAs) to incorporate policies on climate change mitigation and adaptation in Development Plan Documents, thereby amending the Planning and Compulsory Purchase Act (2004).

Additionally, the Planning and Energy Act (2008) sets out powers for LPAs to have development plan policies which impose reasonable requirements for a proportion of energy used by developments in their area to be energy from renewable sources and/or to be low carbon energy from sources in the locality of the development. As such, this allows LPAs to set energy efficiency standards in their development plan policies that exceed the energy efficiency requirements of the Part L Building Regulations. While Government considered withdrawing this power from LPAs (via Section 43 of the Deregulation Act 2015), they determined not to enact this. This is especially important for ambitious local authorities who are striving to reach net zero ahead of national targets.

Nonetheless, the role of local policy in setting energy efficiency requirements may be revisited with upcoming changes to Parts L and F of the Building Regulations. These changes were first consulted on in 2020, under the guise of the Future Homes Standard[15]. The Government set out its intention to "introduce in 2020 a meaningful but achievable uplift to energy efficiency standards as a steppingstone to the [2025] Future Homes Standard". In 2021, the Government published the

[15] UKGBC (2019) The Policy Handbook. Available at: https://www.rockwool.com/syssiteassets/rw-uk/downloads/reports/the-policy-playbook-v.1.5-march-2020.pdf [Accessed on 24/03/23]

outcome of the Future Homes consultation[16], outlining what changes will be made and at what pace. This will be followed by a more detailed consultation in 2023, where the Government will consult on the technical elements of the Future Homes Standard, before the legislation comes into force in 2025.

It is anticipated that the new Standard will ensure that all new homes built from 2025 will produce 75-80% less CO_2 emissions than homes delivered to current Building Regulations standards, with low carbon heating and very high fabric standards. From 2025, all new homes will be 'zero-carbon ready', so that no further retrofit work is required to adapt homes to the emerging decarbonised electricity grid.

Nonetheless, it is important to note that the Future Homes Standard only applies to emissions arising from regulated energy, and not unregulated energy, meaning that a proportion of domestic operational emissions are still unaccounted for. The Government recognises this limitation in its response to the consultation, stating that it will "carry out wider work to consider the future of energy efficient and low carbon buildings, looking beyond the scope of Building Regulations...examin[ing] some of the broader and more fundamental questions around how we can ensure that all new buildings are designed and constructed to be fit for a zero-carbon future"[17]. No date is given by which this work can be expected, although the Government's intention seems to be to include not just unregulated energy but also construction emissions in its future analysis.

Prior to the Future Homes Standard being introduced in 2025, interim Building Regulations have been implemented which require new homes built from June 2022 to produce 31% less carbon emissions compared to current standards. Exceptions to this apply if a building notice, initial notice, or full plans for building work were submitted to a local authority before 15 June 2022. If this is the case, providing the building work commences by 15 June 2023, work on that individual building is permitted to continue under the previous Building Regulations.

For non-residential developments, the Government also intends to introduce higher energy efficiency standards nationally through the Future Buildings Standard 2025. In December 2021, the Government published its response to the Future Buildings Standard consultation on proposed changes to Part L (conservation of fuel and power) and Part F (ventilation) of the Building Regulations[18]. Prior to 2025, interim Building Regulations (implemented in June 2022) now require an uplift in energy efficiency in non-residential buildings, requiring a 27% reduction in emissions compared to current standards. This will rely on increased efficiency as well as fabric improvements.

[16] Department for Levelling Up, Housing and Communities (2021) The Future Homes Standard: 2019 Consultation on changes to Part L (conservation of fuel and power) and Part F (ventilation) of the Building Regulations for new dwellings, p10. Available at: https://www.gov.uk/government/consultations/the-future-homes-standard-changes-to-part-l-and-part-f-of-the-building-regulations-for-new-dwellings [Accessed on 24/03/23]

[17] MHCLG (2021) Written evidence submitted by the Ministry of Housing, Communities and Local Government (with the Department for Business, Energy and Industrial Strategy) [PNZ 048]. Available at: https://committees.parliament.uk/writtenevidence/26906/html/ [Accessed on 24/03/23]

[18] Department for Levelling Up, Housing and Communities (2021) The Future Buildings Standards Consultation. Available at: https://www.gov.uk/government/consultations/the-future-buildings-standard [Accessed on 24/03/23]

3. National Policy and Guidance

3.1 UK Government policies and strategies

In response to its climate change commitments, the UK Government has produced numerous sector-specific policies and strategies relevant to this study, including the Clean Growth Strategy (2017), Industrial Strategy White Paper (2017), draft UK National Energy & Climate Plan (2019), Decarbonising Transport Plan (2021), Net Zero Strategy (2021), Heat and Buildings Strategy (2021) and the Ten Point Plan for a Green Industrial Revolution (2020). The Ten Point Plan for a Green Industrial Revolution, published in November 2020, set out Government's Plan for a green industrial revolution which will create up to 250,000 jobs. The plan will mobilise £12 billion of Government investment, and potentially three times as much from the private sector, to invest in making the UK a "global leader in green technologies." The plan focuses on increasing ambition in the following areas: advancing offshore wind; driving the growth of low carbon hydrogen; delivering new and advanced nuclear power; accelerating the shift to zero emission vehicles, green public transport, cycling and walking, 'jet zero' and green ships; greener buildings; investing in carbon capture, usage, and storage; protecting our natural environment; green finance; and innovation. The plan formed the foundation for a suite of new publications, including the Energy White Paper (2020), the National Infrastructure Strategy (2020), the Industrial Decarbonisation Strategy (2021) and the Decarbonising Transport Plan (2021), each of which highlight decarbonisation as an overarching priority.

The Net Zero Strategy (2021) set out Government's vision for transitioning to a net zero economy, building on the various sectoral plans published in 2020/21. It detailed key policies for achieving net zero by 2050, including:

- Ending the sale of new petrol and diesel cars and vans by 2030;
- Powering the UK entirely with clean electricity by 2035;
- Providing grants to upgrade home heating systems from gas boilers to heat pumps and other low-carbon heating systems; and
- Tripling the rate of woodland creation in England, by planting at least 30,000 hectares of new woodland per year.

The Energy White Paper, published in December 2020, provided further detail on the Government's preferred direction for energy development. The overarching objective is to transform the UK's energy system to support reaching net zero by 2050. In the paper, Government states that it is not targeting a particular energy generation mix for 2050, yet it places particular emphasis on the following technologies: offshore wind; electric heat pumps; hydrogen; and nuclear. Carbon capture, utilisation and storage also receives special attention and will benefit from Government investment.

The Community Energy Strategy was published in 2014. The strategy aims to make a step towards meeting the UK's commitment to encourage community owned renewable energy schemes. The strategy focuses on creating a supportive environment for community energy and removing specific barriers to growth. The strategy supports communities to produce, reduce use of, manage and purchase energy. National planning policy stipulates that the planning system should support the transition to a low carbon and resilient future.

3.2 UK Guidance Documents

The Climate Change Committee has published multiple guidance documents aimed at central and local Government, which identify focus areas for climate action and the pathway to net zero. In 2019, the UK Climate Change Committee (CCC) released two reports of relevance: 'UK Housing: Fit for the future? and 'Net Zero – The UK's contribution to stopping global warming.
The following year, the CCC followed up with three further key publications: 'The Sixth Carbon Budget - The UK's path to Net Zero' (2020), 'Local Authorities and the Sixth Carbon Budget' (2020) and 'Land use: Policies for a Net Zero UK' (2020). The CCC Housing Report warns that the UK housing stock is not contributing sufficiently to emissions reductions and that without the near-complete elimination of greenhouse gas emissions from buildings, national climate targets will not be met. Progress to date in reducing building emissions has been slow; and energy use in homes - which accounts for 14% of total UK emissions - increased between 2016 and 2017. The report also finds that the rate of adapting UK housing stock to climate risks is currently too slow. For new build homes, the report calls for an ambitious trajectory of standards, regulations and targets, by identifying low carbon/renewable heat systems, energy efficiency, passive cooling measures and improved water efficiency. Additionally, the report states that greater emphasis must be placed on reducing the whole-life carbon impact of homes, including embodied and sequestered carbon.

The issue of decarbonising buildings is also picked up in the CCC's 'The Sixth Carbon Budget - The UK's path to Net Zero' report. This report presents the Committee's recommendations to Government for the UK's Sixth Carbon Budget, which will run from 2033 to 2037. The report considers ambitious but realistic sector-based 'pathways' (scenarios) for reaching net zero. To be on track for the 'Balanced Net Zero Pathway', four priorities are identified over the coming decade for residential buildings: deliver on plans to upgrade all properties to EPC C; scale up the market for heat pumps as a vital technology for decarbonising space heating; expand the rollout of low-carbon heat networks in dense areas; and prepare for a potential role for hydrogen in heating.

The Balanced Pathway requires investment across all buildings (residential and non-residential) at an average rate of around £12 billion per year to 2050, partly offset by reductions in operating costs of around £5 billion per year. At a household level, total investment costs are less than £10,000 per home, with 63% of homes needing to spend no more than £1,000 on retrofitting energy efficiency measures. Upgrading the building stock will not only reduce emissions, but also deliver significant wider benefits in terms of improved health and comfort levels and adapting to a changing climate.

Additionally, by 2030, the Committee concluded that current Government plans are insufficient, given that they are projected to deliver only half of required emissions reductions. "Clear, stable and well-designed policies" to reduce emissions must therefore be implemented rapidly and across the whole economy"[19]. The report stressed that emissions reductions cannot be left to central Government departments; every level of Government must contribute. It adds that city and local authorities are well placed to understand the needs and opportunities in their local area, and they have important roles on transport planning, including providing high-quality infrastructure for walking and cycling, provision of charging infrastructure for electric vehicles, and ensuring that new housing developments are designed for access to public transport.

[19] Climate Change Committee (2019) Net Zero – The UK's contribution to stopping global warming. Available at: https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/ [Accessed 24/03/23]

The need for bottom-up action, enacted at the local authority level, is reinforced in the CCC's 'Local Authorities and the Sixth Carbon Budget' report[20]. It identifies that, while emissions reduction progress to date has largely been driven through central policy to phase out coal for electricity production, more than half of the required emissions cuts (in the Sixth Carbon Budget) rely on people and businesses taking up low-carbon solutions. These decisions - such as installing low-carbon heating or switching to an electric vehicle - are made at a local and individual level, and often depend on having supporting infrastructure and systems in place. Local authorities have a key enabling and encouraging role in this behaviour change. Moreover, through their duties and powers, the report finds that local authorities have power or influence over roughly one third of emissions within their local area.

To ensure that local authorities have sufficient power, capacity and finance to deliver the changes needed for net zero, as well as that local plans and policies are coordinated (rather than fragmented), the report makes four priority recommendations for central Government.

3.3 National Planning Policy Framework

The National Planning Policy Framework (NPPF) (2021) is the key guiding document in local authority plan-making and development management. It requires plans to take a proactive approach to climate change mitigation and adaption, in line with the objectives and provision of the Climate Change Act (2008). Climate change is referenced throughout the NPPF, including acknowledgment that climate change adaptation and mitigation is one of the key pillars of sustainable development. Other guidance includes encouraging the reduction of greenhouse gas emissions, encouraging the reuse of existing resources, supporting renewable and low carbon energy, supporting community-led initiatives for renewable and low carbon energy development, and guidance on utilising Section 106 and Community Infrastructure Levy contributions for climate change mitigation.

Relevant paragraphs from the NPPF are as follows:

> *152. 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 should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure****.*
>
> *Planning for climate change*
>
> *153. Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures53. Policies should support appropriate measures to ensure the future resilience of communities and infrastructure to climate change impacts, such as providing space for physical protection measures, or making provision for the possible future relocation of vulnerable development and infrastructure.*
>
> *154. New development should be planned for in ways that:*

[20] UK Climate Change Committee (2020) The Sixth Carbon Budget - The UK's path to Net Zero. Available at: https://www.theccc.org.uk/wp-content/uploads/2020/12/The-Sixth-Carbon-Budget-The-UKs-path-to-Net-Zero.pdf [Accessed 24/03/23]

a) avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure; and

b) can help to reduce greenhouse gas emissions, such as through its location, orientation and design. ***Any local requirements for the sustainability of buildings should reflect the Government's policy for national technical standards****.*

155. To help increase the use and supply of renewable and low carbon energy and heat, plans should:

a) provide a positive strategy for energy from these sources, that maximises the potential for suitable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts);

b) consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and

53 In line with the objectives and provisions of the Climate Change Act 2008.

c) identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for co-locating potential heat customers and suppliers.

156. Local planning authorities should support community-led initiatives for renewable and low carbon energy, including developments outside areas identified in local plans or other strategic policies that are being taken forward through neighbourhood planning.

157. In determining planning applications, local planning authorities should expect new development to:

a) comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and

b) take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.

158. When determining planning applications for renewable and low carbon development, local planning authorities should:

a) not require applicants to demonstrate the overall need for renewable or low carbon energy, and recognise that even small-scale projects provide a valuable contribution to cutting greenhouse gas emissions; and

b) approve the application if its impacts are (or can be made) acceptable. Once suitable areas for renewable and low carbon energy have been identified in plans, local planning authorities should expect subsequent applications for commercial scale projects outside these areas to demonstrate that the proposed location meets the criteria used in identifying suitable areas.

3.4 National Planning Practice Guidance

National Planning Practice Guidance (NPPG) provides additional guidance to support the understanding and implementation of the NPPF. On climate change, the NPPG provides examples of how local plans can mitigate climate change by promoting a reduction in emissions, as well as adapt to climate risks:

- Reducing the need to travel and providing for sustainable transport
- Providing opportunities for renewable and low carbon energy technologies e.g. through district heating networks that include tri-generation (combined cooling, heating and power)
- Providing opportunities for decentralised energy and heating e.g. maximising summer cooling through natural ventilation in buildings
- Promoting low carbon design approaches to reduce energy consumption in buildings, such as passive solar design
- The provision of multi-functional green infrastructure; and
- Considering future climate risks when allocating development sites to ensure risks are understood over the development's lifetime.

The Renewable and Low Carbon Energy NPPG[21] expands upon paragraph 155 of the NPPF, which states that plans should maximise the potential for renewable energy generation. The guidance sets out how local plans should account for renewable and low carbon energy and heat, including through the provision of a positive strategy, and considering the identification of suitable areas for energy generation and supporting infrastructure.

The guidance acknowledges that community led renewable energy initiatives are likely to play an increasingly important role and that these should be encouraged as a way of providing positive local benefits. Additionally, it suggests that local planning authorities may wish to establish policies which give positive weight to renewable and low carbon energy initiatives which have clear evidence of local community involvement.

The Housing Standards Review (2015)[22] was intended to consolidate the numerous standards, regulations and guidance surrounding housing development. Crucially, one outcome of the review was that the Code for Sustainable Homes could no longer be required within planning conditions and instead was replaced by Building Regulations. As a result, Building Regulations Part L energy requirements were then set equivalent to the CSH level 4 (equivalent to a 19% improvement on the dwelling emission rate over previous regulations). This 19% improvement is now commonly seen in recent local plans. As the UK Government stated in their 2021 Response to the Future Homes Standard consultation, local authorities will maintain the ability to set their own energy performance standards beyond the 19% improvement in their planning policies.

[21] UK Government (2015) Renewable and Low Carbon Energy. Available at: https://www.gov.uk/guidance/renewable-and-low-carbon-energy [Accessed on 24/03/23]

[22] UK Government (2015) Housing standards review: technical consultation. Available at: https://www.gov.uk/government/consultations/housing-standards-review-technical-consultation [Accessed on 24/03/23]

4. Local Context

4.1 MBC Strategies

In April 2019, MBC declared a Biodiversity and Climate Emergency. The Council then agreed a Biodiversity Climate Change Strategy and action plan to address the Emergency in October 2020.

The Action Plan identifies nine themes where the Council could control or influence actions. These are:

- Creating a travel plan and building supporting infrastructure for electric vehicles.
- Supporting residents and businesses to move away from using fossil fuels, reduce emissions and improve the energy efficiency of buildings.
- Generating renewable energy to support the move away from fossil fuels.
- Reducing waste and energy used for processing waste.
- Adapting to climate change.
- Enhancing and increasing biodiversity by providing ecosystem services including clean water, clean air, rainwater absorption and flood mitigation.
- Making the Council's estate carbon neutral.
- Providing information to residents, organisations and businesses, including signposting to grant funding.
- Ensuring climate change and biodiversity are considered when all decisions are made.

MBC have committed to becoming as close to carbon neutral (or 'Net Zero') as possible by 2030. The long-term aspiration is also to become carbon negative or a footprint less than neutral, so that there would be a net removal of carbon dioxide from the atmosphere.

At a borough-wide scale, in accordance with national government targets, and based on Tyndall Centre data, carbon reduction milestones have been set out to reduce CO_2 emissions by 13.4% each year across the borough to reach near to Net Zero by 2041. The Tyndall Centre data typically provides the net zero pathway consistent with national policy.

4.2 Emerging Policy in the Local Plan Review

Maidstone's emerging Local Plan Review (LPR) policy supports the Council's ambition of becoming a carbon neutral Borough by 2030, by delivering sustainable and low carbon growth which protects the Borough's natural environment. It will also seek to facilitate the necessary infrastructure to enable residents and businesses to minimise their impact on and respond to climate change. Developments will have considered the potential for the site to be delivered in a low carbon way, by incorporating zero or low carbon technologies, enabling future technologies and facilitating climate change adaptation. Additionally, development will give high regard to the protection and enhancement of biodiversity.

We assume the policy (reproduced below as Policy LPRSP14(C)) provides a typical framework for actions, particularly if supported by further guidance on implementation in supplementary planning documents and monitoring data.

POLICY LPRSP14(C) – CLIMATE CHANGE

To ensure that development in the borough mitigates and adapts to climate change, the council will:

1. Adopt a strategy for growth which delivers development in sustainable locations, well supported by or capable of delivering better services and public transport which will minimise the need to travel.
2. Encourage the delivery of sustainable buildings and a reduction of CO2 emissions in new development, having regard to the Kent and Medway Energy and Low Emissions Strategy.
3. Encourage and support the delivery of low carbon energy and low carbon heat networks in new developments.
4. Support the provision of renewable energy infrastructure within new development.
5. Require the integration of blue-green infrastructure into qualifying new development in order to mitigate urban heat islands, enhance urban biodiversity, and to contribute to reduced surface water run off through the provision of SuDS.
6. Require development involving the creation of new dwellings, retail, and/or employment space to encourage a shift towards sustainable travel through:
   a) prioritising active travel by ensuring good provision and connectivity of walking and cycling routes;
   b) ensuring public transport accessibility and;
   c) through the provision of electric vehicle infrastructure.
7. Require high levels of water efficiency in new residential development to ensure that water consumption should not exceed 110l per person per day.
8. Require new development involving the creation of new dwellings, retail floorspace and/or employment floorspace to plan for and respond to the impacts of climate change.
9. Require new development to include a Flood Risk Assessment where the site is located within Flood Zones 2 or 3, or is over 1 hectare in size.

Climate change issues are also addressed through Policy LPRQ&D1 for sustainable design (as below). The Policy considers the lifecycle of development, as well as the short-term construction phase, through the use of the Building Research Establishment Environmental Assessment Method (BREEAM) as an industry-standard assessment method by which to judge and require increased sustainability standards in new non-residential developments. It seeks proposals should achieve a minimum of the Very Good BREEAM standard.

BREEAM captures many elements of sustainable design, going beyond building design to promote sustainable land use, habitat protection and creation, and long-term biodiversity for a building's site and surrounding land. Similarly, BREEAM encourages access to sustainable means of transport for building users, specifically with a focus on the accessibility of public and active transport and designing to support a reduction in car journeys. Efficient use of resources is also an integral part of sustainable design principles captured by BREEAM, for example, encouraging measures to reduce future waste arising from the construction and operation of the building, and encouraging

sustainable water use in the operation of the building and its site (including means of reducing potable water consumption and minimising losses through leakage).

In terms of energy efficiency and carbon emissions for residential development, the plan correctly assumes this will be achieved through a strengthening of the energy performance requirements in Part L of the Building Regulations (incorporating carbon compliance, energy efficient fabric and services).

The evidence underlying these climate policies is not explicit, beyond the Council's climate change action plan. However, the policies are not particularly controversial and seem to us to be sufficiently justified by a combination of national policy and other adopted local plan precedents. Some authorities have gone further and published evidence base documents which combine reviews of legislation and policy with local modelling of carbon/local greenhouse gas emissions.

Additionally, the Policy emphasis on water efficiency is noted. It is assumed that this has been aligned with the Building Regulations Part G 'optional' requirement of 110 litres water consumption per day per person for new residential development. Any additional requirements in the DPD might need to be supported by a Water Cycle Study - we have not yet identified a study later than one by Halcrow in 2010[23]. However, on the assumption that Maidstone is not facing issue of water or nutrient neutrality, the 110L/d per person looks typical and is unlikely to require further justification, or increasing in the DPD.

Policies LPRQ&D1 and LPRINF3 also address renewable energy. The MBC Climate Change and Biodiversity Strategy and Action plan in 2020 committed the Council to explore potential partners to support delivery of Combined Heat and Power and District Heating Scheme developments across the Borough. We therefore consider that capacity for renewable energy is not a matter for the DPD.

[23] Halcrow Group Limited (2010) Water Cycle Study – Outline Report. Available at: https://maidstone.gov.uk/__data/assets/pdf_file/0019/12088/Water-Cycle-Study-Outline-Report-2010.pdf [Available at: 24/03/23]

Policy LPRQ&D 1: Sustainable design

Applications for new development involving the erection or conversion of a building should demonstrate how sustainability has been incorporated into the design, construction, and operation of the development.

1. Proposals for new development shall demonstrate how the scheme has adopted a 'fabric first' approach to sustainable design, by incorporating energy efficiency measures into new buildings.

2. New dwellings should meet the Building Regulations optional requirement for tighter water efficiency of 110l per person, per day.

3. Non-residential development, where appropriate and technically feasible and viable, should meet BREEAM Technical Standard (2018) Very Good rating including addressing maximum water efficiencies under the mandatory water credits.

4. Proposals for new non-domestic buildings should achieve BREEAM Very Good for energy credits where appropriate and technically and financially viable. Should BREEAM be replaced, or any national standards increased, then this requirement will also be replaced by any tighter standard appropriate to the borough.

5. All developments will be expected to incorporate 10% on-site renewable or low carbon energy production where appropriate. This shall be measured as a percentage of overall consumption.

6. Where possible new development should be designed and orientated so as to ensure that it responds to or allows for future adaptation to the impacts of climate change over its lifetime.

9. New development proposals shall incorporate into the fabric of the building bird, bat and bee habitats, and shall provide the planting of native tree and shrub species, wildflower grasses, and habitats for insects and invertebrates where appropriate.

10. All development where on-site renewable energy is provided will be expected to incorporate battery energy storage where feasible.

Policy LPRINF3: Renewable and low carbon energy schemes

1. Applications for larger scale renewable (as defined by the Planning Policy Advice Note (2014): Domestic and medium scale solar PV arrays (up to 50kW) and solar thermal; and Planning Policy Advice Note: Large scale (>50kW) solar PV arrays) or low carbon energy projects will be required to demonstrate that the following have been considered in the design and development of the proposals:

   i. The cumulative impact of such proposals in the local area;
   ii. The landscape and visual impact of development;
   iii. The impact on heritage assets and their setting;
   iv. The impact of proposals on the amenities of local residents, e.g., noise generated;
   v. The impact on the local transport network; and
   vi. The impact on ecology and biodiversity including the identification of measures to mitigate impact and provide ecological or biodiversity enhancement.

2. Preference will be given to existing commercial and industrial premises, previously developed land, or agricultural land that is not classified as the best and most versatile.

3. Provision for the return of the land to its previous use must be made when the installations have ceased operation.

4. Proposals for Combined Heat and Power and District Heating Schemes will be supported where any above ground infrastructure is acceptable on amenity and design grounds, and where such developments accord with policies elsewhere in the plan.

5. Experience in other Authorities Elsewhere

Our reviews of policy elsewhere suggest that The London Plan 2021 is perhaps at the leading edge of climate change policy – indeed we have yet to find any other planning policy that is as comprehensive. Other areas such as Cornwall[24] are producing specific climate emergency policy (in Cornwall's case, as a DPD) but are not as ambitious. We begin to consider the additional areas of policy that the DPD might cover based on analysis of The London Plan below.

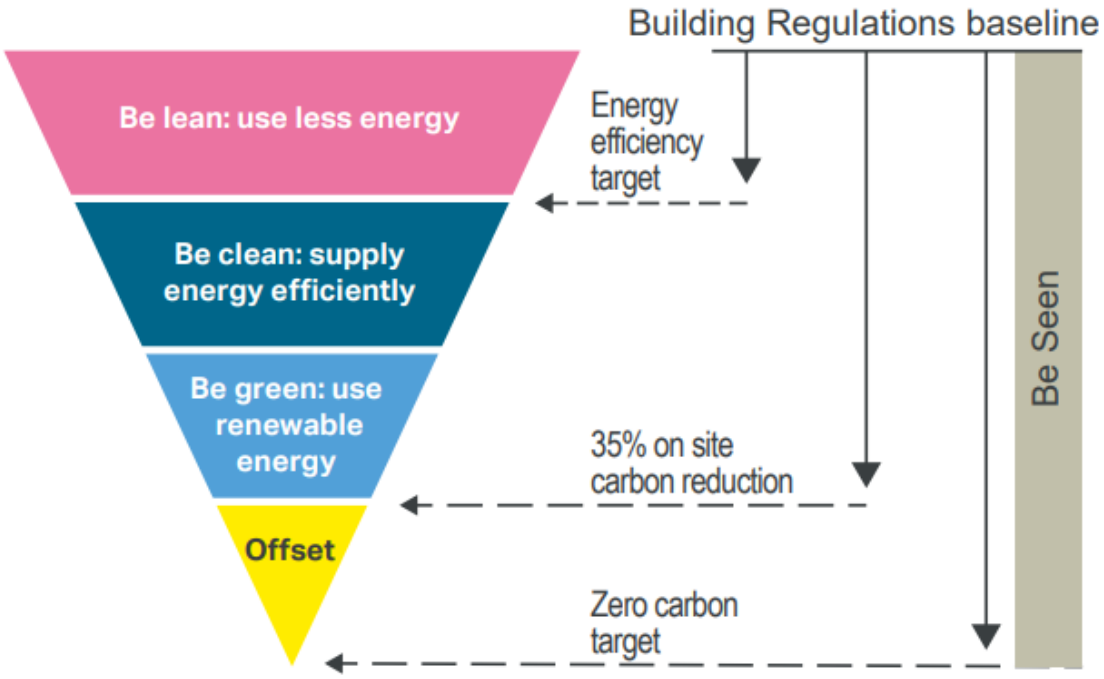
5.1 Energy Hierarchy

The London Plan's approach provides an example of a potentially more comprehensive approach than Maidstone's emerging Local Plan Review, particularly in respect of employing an energy hierarchy. The hierarchy is intended to guide the design, construction and operation of new buildings through the application of a prioritised set of decision-making principles. These principles are accompanied by specific targets, notably a minimum 35% reduction in on-site carbon emissions beyond the Building Regulations requirements for major developments.

[24] Cornwall Council (2022) Climate Emergency Development Plan Document, Pre-Submission Consultation. Available at: https://www.cornwall.gov.uk/media/z2mhbppb/sd01-1-cedpd-draft-master-with-additional-edits-may-22-1.pdf [Accessed on 24/03/23]

Following the hierarchy in order of highest priority, 'Be lean' refers to reducing energy demand, through designing a building's fabric and orientation to maximise daylight, passive heating and cooling, as well as managing demand during operation. Secondly, 'Be clean' relates to utilising available local energy sources such as connecting to a local district heat network, and supplying energy efficiently. 'Be green' then encourages the maximisation of on-site renewable energy generation and storage. Once it has been demonstrated that these options have been exhausted and net-zero has not been achieved, residual emissions can be offset through payment to a London Borough carbon offset fund, or a verified local alternative. The final hierarchy component, 'be seen', requires energy performance to be monitored, verified and reported.

Figure 9.2 - The energy hierarchy and associated targets



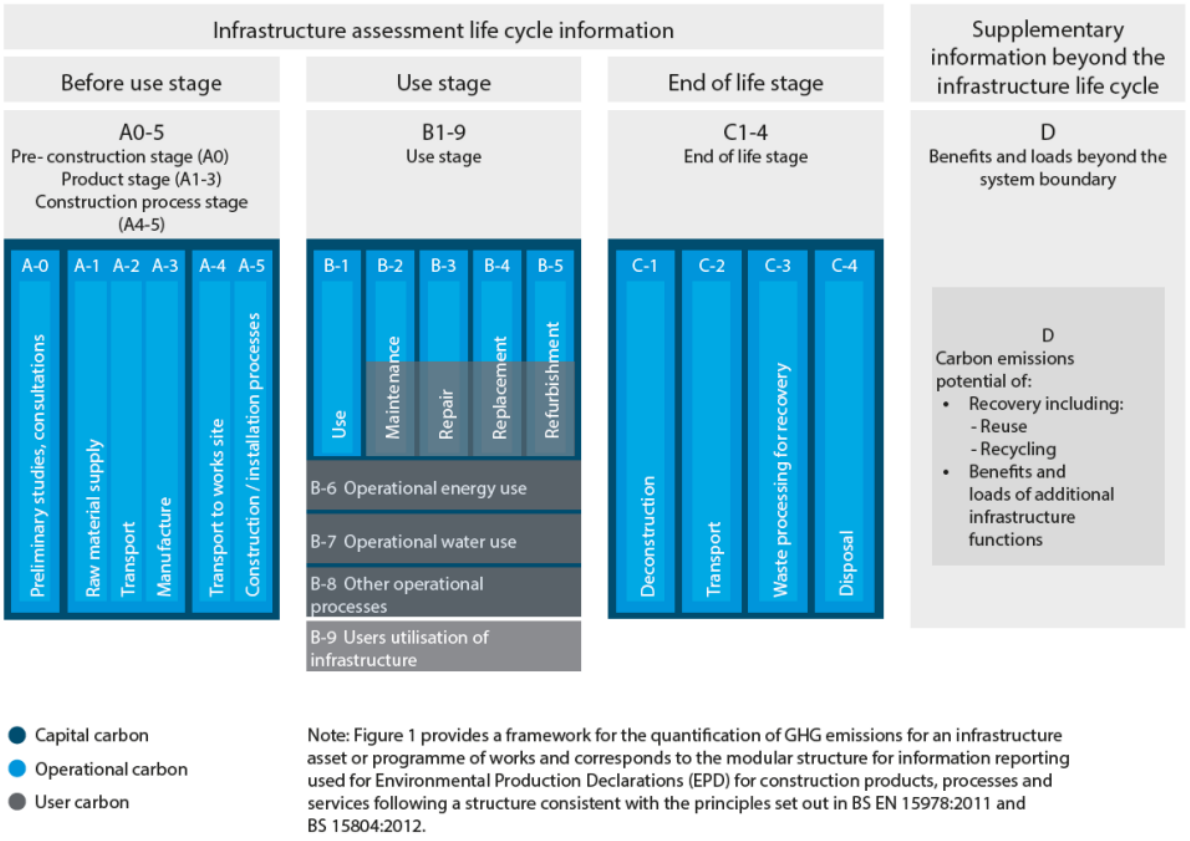
Source: Greater London Authority

Maidstone's emerging LPR broadly adopts similar objectives, by supporting development proposals that are 'lean', 'clean' (maximise use of low-carbon local energy sources), and 'green' (reduce on-site energy demands and maximise on-site generation). The policy falls short of requiring development proposals to include an energy strategy, setting out how operational performance will be monitored, verified and reported. Subject to viability testing, such a requirement could be proportionate for major residential and non-residential development. An energy monitoring plan could also be included in the Sustainability Statement.

5.2 Embodied Carbon

Embodied carbon are starting to be addressed in other Local Plans. It is currently suggested that embodied carbon accounts for between 22-34% of total annual built environment emissions in the UK. This is expected to rise to 40% by 2050.

To account for embodied carbon, developers could provide a whole life-cycle carbon assessment. This supplies a more accurate reflection of the complete carbon impact of a building by accounting for regulated, unregulated, and embodied emissions over the lifecycle of a building i.e. from raw material extraction through to end of life (see figure below from PAS2080:2016 Carbon Management in Infrastructure, BSI, 2016).



Note: Figure 1 provides a framework for the quantification of GHG emissions for an infrastructure asset or programme of works and corresponds to the modular structure for information reporting used for Environmental Production Declarations (EPD) for construction products, processes and services following a structure consistent with the principles set out in BS EN 15978:2011 and BS 15804:2012.

As an example, the approach to carbon (including embodied carbon) is demonstrated by London Plan Policy SI 2 below[25]. It addresses embodied carbon through the requirement for a whole carbon assessment in Part F.

Policy SI 2 Minimising greenhouse gas emissions

A Major development should be net zero-carbon.[151] This means reducing greenhouse gas emissions in operation and minimising both annual and peak energy demand in accordance with the following energy hierarchy:

1) be lean: use less energy and manage demand during operation
2) be clean: exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly
3) be green: maximise opportunities for renewable energy by producing, storing and using renewable energy on-site
4) be seen: monitor, verify and report on energy performance.

B Major development proposals should include a detailed energy strategy to demonstrate how the zero-carbon target will be met within the framework of the energy hierarchy.

C A minimum on-site reduction of at least 35 per cent beyond Building Regulations[152] is required for major development. Residential development should achieve 10 per cent, and non-residential development should achieve 15 per cent through energy efficiency measures. Where it is clearly demonstrated that the zero-carbon target cannot be fully achieved on-site, any shortfall should be provided, in agreement with the borough, either:

1) through a cash in lieu contribution to the borough's carbon offset fund, or
2) off-site provided that an alternative proposal is identified and delivery is certain.

D Boroughs must establish and administer a carbon offset fund. Offset fund payments must be ring-fenced to implement projects that deliver carbon reductions. The operation of offset funds should be monitored and reported on annually.

151 Where zero-carbon is used in the Plan it refers to net zero-carbon – see Glossary for definition.

152 Building Regulations 2013. If these are updated, the policy threshold will be reviewed. https://www.gov.uk/government/publications/conservation-of-fuel-and-power-approved-document-l

[25] Greater London Authority (2021) The London Plan 2021, pp.342-343. Available at: https://www.london.gov.uk/programmes-strategies/planning/london-plan/new-london-plan/london-plan-2021 [Accessed on 24/03/23]

> E Major development proposals should calculate and minimise carbon emissions from any other part of the development, including plant or equipment, that are not covered by Building Regulations, i.e. unregulated emissions.
>
> F Development proposals referable to the Mayor should calculate whole life-cycle carbon emissions through a nationally recognised Whole Life-Cycle Carbon Assessment and demonstrate actions taken to reduce life-cycle carbon emissions.

The Whole Life Carbon Assessments (WLC) London Plan Guidance Note[26] provides guidance on addressing Part F of the above Policy. This requires proposals referable to the Mayor of London to calculate WLC emissions through a nationally recognised WLC assessment; and to demonstrate actions taken to reduce life-cycle carbon emissions. The guidance was developed with technical expertise from consultants Cundall and Targeting Zero, and via thorough engagement with a wide range of stakeholders including developers and industry experts.

WLC emissions are the carbon emissions resulting from the materials, construction and the use of a building over its entire life, including its demolition and disposal. A WLC assessment provides a fuller picture of a building's carbon impact on the environment. The guidance sets out how WLC information should be collected and reported at different stages of the design and development process. This is an innovative approach that captures carbon emissions of the built environment that are not currently well understood or reported and sits alongside the long-established and successful approach to reducing the operational carbon emissions of buildings in successive London Plans.

The technical detail set out in the WLC LPG is considered critical to the implementation of the London Plan policy to reduce greenhouse gas emissions and will help to embed consideration of WLC in the design of buildings.

5.3 Commentary on the London Approach

The Low Energy Transformation Initiative (LETI) is a network of over 200 built environment professionals that are working together to drive a zero carbon future. This voluntary group is made up of developers, engineers, housing associations, architects, planners, academics, sustainability professionals, contractors and facilities managers, with support and input provided by the GLA and London Boroughs. LETI was established to work collaboratively to put together evidence-based recommendations for two pieces of policy – the new London Environment Strategy and the rewrite of the London Plan.

Based on LETI's response to adopted London Plan policy (see figure below), they consider that it will not deliver on Net Zero for new buildings by 2030. Instead, LETI consider that all new

[26] Mayor of London (2022) London Plan Guidance – Whole Life-Cycle Carbon Assessments. Available at: https://www.london.gov.uk/sites/default/files/lpg_-_wlca_guidance.pdf [Accessed on 24/03/23]

buildings should have zero carbon emissions in operation by 2030, in line with their one-pager on the topic (see Appendix A).

LETI believes that the following policy changes are required to deliver operational Net Zero Carbon for new buildings by 2030:

1. 'Operational Zero Carbon' by 2030 for all new buildings - this moves beyond the current definition of a 'design prediction' using a 'percentage CO_2 reduction', to deliver actual operational and measured zero carbon buildings.
2. An absolute kWh metric - to allow the full range of stakeholders involved in the design, operation and delivery of our buildings to understand and therefore fully contribute to reducing energy consumption.
3. Adding a 'Be Seen' stage to the energy hierarchy - we fully support the inclusion of energy monitoring, this is seen as fundamental to achieving operational zero emissions and thus should be elevated into policy SI 2 A.
4. Energy strategies to demonstrate future-proofing to 'Operational Zero Carbon' on-site by 2030 - we support clause 9.2.10 i of the draft London Plan, but believe leaving it until 2050 will only encourage further lock-in to fossil fuel and urban combustion pollution.
5. Addressing whole life embodied carbon to be explicitly included in Policy SI 2 - to drive innovation addressing what will become the largest building carbon emissions challenge once operation carbon is reduced.
6. A zero emissions by 2030 transition plan to be provided for all district heat/energy networks, alongside disclosing energy usage and efficiency data to ensure that networks are part of the solution to delivering operational zero emissions.
7. The heating hierarchy to be renamed and rearranged to emphasise the changing priorities of a trajectory to a zero carbon London.
8. The importance of minimising energy demand peaks to be strengthened.
9. 'Mayor's Energy Advocates' to be available for boroughs to assist in ensuring sustainable design is embedded, as a parallel to the Mayor's Design Advocates.

5.4 Circular Economy

A further issue addressed by The London Plan 2021 is that of the circular economy[27]. The circular economy model concept aims to decouple economic growth from resource consumption. In a circular economy, renewable materials are used where possible, energy is provided from renewable sources, natural systems are preserved and enhanced, and waste and negative impacts are designed out. Materials, products and components are managed in repetitive loops, maintaining them at their highest useful purpose as long as feasible, which minimises resource waste.

Circular economy principles of minimising resource use and waste are likely to be increasingly embedded in policies throughout a local plan. Policies promoting the harvesting and recycling of rainwater, for example, embody circularity. Similarly, policies promoting the integration of renewable energy technologies or sustainable modes of transport equally embody the principles of circularity.

The London Plan recognises that the circular economy is essential to achieving 'Good Growth' - growth that is socially and economically inclusive and environmentally sustainable. The Plan seeks to be a catalyst for the circular economy by requiring major developments to provide evidence that they are hard-wiring circular economy principles into schemes (Policy SI7).

London Plan policy requires that all strategic developments (those referable to the Mayor of London) will be required to submit a Circular Economy Statement and Boroughs are encouraged to adopt a similar approach for non-strategic/non-referable schemes, setting their own threshold.

The Circular Economy Statement must demonstrate:

[27] Mayor of London (2022) London Plan Guidance – Circular Economy Statements. Available at: https://www.london.gov.uk/sites/default/files/circular_economy_statements_lpg_0.pdf [Accessed on 24/03/23]

- how all materials arising from demolition and remediation works will be re-used and/or recycled
- how the proposal's design and construction will reduce material demands and enable building materials, components and products to be disassembled and re-used at the end of their useful life
- opportunities for managing as much waste as possible on site
- adequate and easily accessible storage space and collection systems to support recycling and re-use
- how much waste the proposal is expected to generate, and how and where the waste will be managed in accordance with the waste hierarchy
- how performance will be monitored and reported.

The supporting text recognises that incorporating circular economy principles into the design of developments will be crucial, referencing Policy SD3 'Optimising site capacity through the design-led approach', which requires development to "take into account the principles of the circular economy".

The Circular Economy Statements London Planning Guidance explains how to prepare a Statement, as required by Policy SI 7 of the London Plan. A key aspect of this Guidance concerns approaches to reusing and demolishing existing buildings. It sets out a hierarchy, with retention and retrofit of existing buildings at the top and demolition at the bottom. A 'decision tree' sets out a series of questions for a proposed scheme, which inform the approach to retention and/or demolition. A crucial question is whether the existing building (or parts of it) is suited to the requirements for the site, and the guidance explains that, where disassembly or demolition is proposed, applicants should set out how the options for retaining and reconstructing existing buildings have been explored and discounted, and show that the proposed scheme would be a more environmentally sustainable development.

This aspect of the guidance reflects the balance that needs to be struck when considering the most sustainable approach to designing a development where existing buildings are involved – on one hand, the importance of keeping embodied carbon in situ; on the other hand, the need to accommodate Good Growth through sustainable patterns of development. While there are scenarios where refurbishing existing buildings is preferable, there may still be other scenarios where refurbishment would fail to optimise a site – for example, a low-density retail park close to public transport. The guidance thus recognises that different approaches will need to be taken on different sites.

The extent to which Maidstone might wish to follow The London Plan, or other LPAs, on circular economy is a matter for discussion.

6. Discussion and Conclusions

Emerging Maidstone LPR policy is comprehensive and considered justifiable by the UK Government's legal commitments and policy on addressing climate change. The Aspinall Verdi viability assessment[28] also appears to suggest that net zero requirements are broadly viable. Policy is also similar to many other authorities' approaches.

Additional DPD Policies on climate change and sustainable buildings could include the following:

- **Setting energy efficiency standards on all development.** The DPD could include planning policies to set energy efficiency standards that exceed the target emission rates of the Part L Building Regulations. MBC could also require new developments to be net zero, specifying a minimum percentage of this net zero target to be achieved through emissions reductions above Building Regulations and through on-site renewable energy. Carbon offsets could also be used to make up any shortfall.
- **Setting specific energy efficiency standards on non-residential development**. Effectively update MLP Policy LPRQ&D 1: Sustainable Design to require major and minor development to meet Future Buildings Standard emissions reductions as a minimum with preferential support for BREEAM 'Excellent'.
- **Whole Life-Cycle Carbon Assessments**. The DPD could require whole lifecycle carbon assessments (WLC) for major applications. The WLC would quantify the emissions arising through the construction, use and disposal of a building over its entire life. Planning applications could be expected to demonstrate through their WLC that efforts have been made to reduce all emission types. Guidance on how to undertake WLCs would probably need to be provided in the Sustainable Design and Construction SPD or similar.
- **Sustainability Statements.** Sustainability Statements could be required with planning applications to demonstrate how development is contributing to tackling climate change, including consideration of the energy hierarchy, whole life cycle considerations (for major development) and how monitoring and reporting on performance will be delivered.
- **On-site renewable energy potential.** On-site renewable energy generation and storage is already encouraged, but DPD policy could ask for Energy assessments (as part of the Sustainability Statements) to explain how the opportunities for producing, storing and using renewable energy on-site will be maximised.
- **Circular Economy**. DPD Policy could cover demolition strategies, specification of construction materials, proportions of reused and reusable materials, and mandatory whole life-cycle calculation. MBC could require the submission of Circular Economy Statements, either standalone or as part of the Sustainability Statement, to support circular economy adoption.

The potential for **viability** arguments to undermine future policy objectives will need to be considered in full. The higher standards considered above are required to meet climate change targets but could impact on viability of schemes themselves or local plan proposals/allocations. Further, it is possible that some developers might seek to argue against the increased costs incurred

[28] Aspinall Verdi (2021) Local Plan Review Viability Assessment & CIL Review. Available at: https://drive.google.com/file/d/1jiHiRwCMIv_PJyWo2KHyENK4rSzCz4T0/view [Accessed on 24/03/23]

by having a policy requirement to meet higher than minimum standards on buildings. This should be reviewed as part of an overall viability review process of the Development Plan to ensure it is aligned with the local market.

However, it could also be argued that the policy recommendations draw on best practice and are underpinned by research and assessments to support the decision-making process to maximise the likelihood of such standards being achieved. The context review highlights the international and national legislative, policy and strategic context within which need for challenging targets and policy wording is required. It also recognises the advice from organisations such as the UK Committee on Climate Change and BREEAM. This context provides a broad evidence base upon which policies can be based and referenced to the legislative, policy and strategic context.

Appendix A. Example Key Requirements for Net Zero Buildings (LETI, 2020[29])

Net Zero Operational Carbon

Ten key requirements for new buildings

By 2030 all new buildings must operate at net zero to meet our climate change targets. This means that by 2025 all new buildings will need to be designed to meet these targets. This page sets out the approach to operational carbon that will be necessary to deliver zero carbon buildings. For more information about any of these requirements and how to meet them, please refer to the: UKGBC - Net Zero Carbon Buildings Framework; BBP - Design for Performance initiative; RIBA - 2030 Climate Challenge; GHA - Net Zero Housing Project Map; CIBSE - Climate Action Plan; and, LETI - Climate Emergency Design Guide.

Low energy use

1. Total Energy Use Intensity (EUI) - Energy use measured at the meter should be equal to or less than:
   - **35 kWh/m²/yr** (GIA) for residential[1]

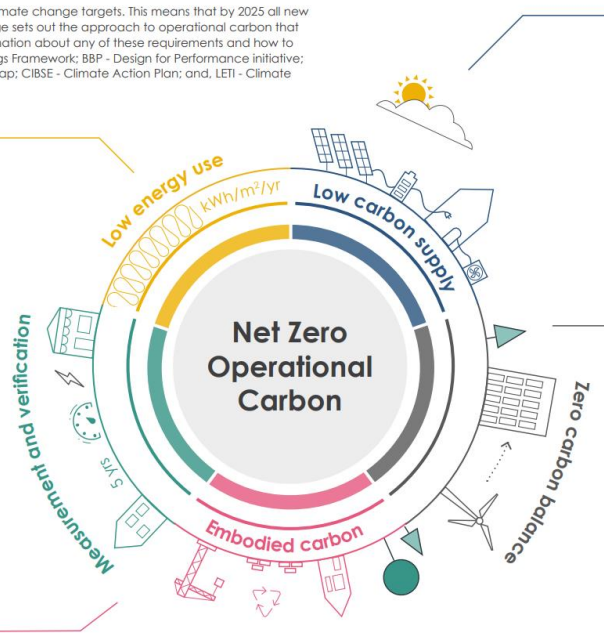
   For non-domestic buildings a minimum DEC B (40) rating should be achieved and/or an EUI equal or less than:
   - **65 kWh/m²/yr** (GIA) for schools[1]
   - **70 kWh/m²/yr** (NLA) or **55 kWh/m²/yr** (GIA) for commercial offices[1,2]
2. Building fabric is very important therefore space heating demand should be less than **15 kWh/m²/yr** for all building types.

Measurement and verification

3. Annual energy use and renewable energy generation on-site must be reported and independently verified in-use each year for the first 5 years. This can be done on an aggregated and anonymised basis for residential buildings.

Reducing construction impacts

4. Embodied carbon should be assessed, reduced and verified post-construction.[3]



Low carbon energy supply

5. **Heating and hot water should not be generated using fossil fuels.**
6. The average annual carbon content of the heat supplied (gCO_2/kWh) should be reported.
7. On-site renewable electricity should be maximised.
8. Energy demand response and storage measures should be incorporated and the building annual peak energy demand should be reported.

Zero carbon balance

9. A carbon balance calculation (on an annual basis) should be undertaken and it should be demonstrated that the building achieves a net zero carbon balance.
10. Any energy use not met by on-site renewables should be met by an investment into additional renewable energy capacity off-site OR a minimum 15 year renewable energy power purchase agreement (PPA). A green tariff is not robust enough and does not provide 'additional' renewables.

Developed in collaboration with: LETI, UKGBC, BBP Better Buildings Partnership

Developed with the support of: Good Homes Alliance, RIBA Architecture.com, CIBSE

Notes:

Note 1 – Energy use intensity (EUI) targets
The above targets include all energy uses in the building (regulated and unregulated) as measured at the meter and exclude on-site generation. They have been derived from: predicted energy use modelling for best practice; a review of the best performing buildings in the UK; and a preliminary assessment of the renewable energy supply for UK buildings. They are likely to be revised as more knowledge is available in these three fields. As heating and hot water is not generated by fossil fuels, this assumes an all electric building until other zero carbon fuels exist. (kWh targets are the same as $kWh_{(GIA)}$). Once other zero carbon heating fuels are available this metric will be adapted.

Note 2 – Commercial offices
With a typical net to gross ratio, 70 kWh/m² NLA/yr is equivalent to 55 kWh/m² GIA/yr. Building owners and developers are recommended to target a base building rating of 6 stars using the BBP's Design for Performance process based on NABERS.

Note 3 – Whole life carbon
It is recognised that operational emissions represent only one aspect of net zero carbon in new buildings. Reducing whole life carbon is crucial and will be covered in separate guidance.

Note 4 – Adaptation to climate change
Net zero carbon buildings should also be adapted to climate change. It is essential that the risk of overheating is managed and that cooling is minimised.

[29] LETI (2022) Net Zero Operational Carbon One-Pager. Available at: https://www.leti.uk/_files/ugd/252d09_0f7760d9a2ba4ab8920f69f8cee3e112.pdf [Accessed on 24/03/23]