Havant Borough Council

CLIMATE CHANGE

Feasibility Study

AUGUST 2024

CONFIDENTIAL

Havant Borough Council

CLIMATE CHANGE

Feasibility Study

TYPE OF DOCUMENT (VERSION) CONFIDENTIAL

PROJECT NO. 70115812

DATE: AUGUST 2024

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QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2	Revision 3
Remarks	Draft for comment	Updated	Updated	
Date	26/03/24	12/06/24	20/08/24	
Prepared by	Steven Fitzpatrick	Steven Fitzpatrick	Steven Fitzpatrick	
Signature				
Checked by			Gareth Oakley	
Signature			Oakley, Gareth (UKGSO775) Digitally signed by Oakley, Gareth (UKGSO775) DN: cn=Oakley, Gareth (UKGSO775), ou=Active, email=gareth.oakley@wsp.com Date: 2024.09.12 10:23:14 +01'00'	
Authorised by	Gareth Oakley	Gareth Oakley	Gareth Oakley	
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Project number	70115812	70115812	70115812	
Report number				
File reference				

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1 INTRODUCTION

1.1 PURPOSE

1.1.1. The purpose of this document is to provide a summary of current climate change policy in the UK. This provides a context of supporting evidence for the revised Local Plan currently in preparation by Havant Borough Council (HBC). It also considers relevant aspects of design and development considerations in achieving net zero buildings within the Borough.

1.2 STRUCTURE OF DOCUMENT

1.2.1. The document addresses each key theme in turn:

- Current national policy position and commitments set out by Havant Borough Council
- Carbon and energy efficiency
- Design, materials and waste
- Climate Change resilience and adaptation
- Sustainable transport

2 LEGISLATIVE AND POLICY CONTEXT

2.1 OVERVIEW

Commentary

- UK Government carbon budgets are set in law
- Supporting policies to drive achievement of net zero targets at UK level continue to be reviewed by the Committee on Climate Change
- While GHG emission reduction (mitigation) is a major focus, there are also requirements to consider resilience to a changing climate (adaptation)

2.1.1. Climate change is regarded as one of the most significant threats of our times and increasing focus is being paid to mitigating and adapting for the future. Actions on climate change are being taken at all levels of the planning system from international agreements and national targets to local planning commitments and strategies for individual developments.

2.1.2. The Climate Change Act 2008, amended in 2019, provides the basis for climate action in the UK. It commits the UK to a 100% reduction in greenhouse gas emissions by 2050, known as the Net Zero commitment. In line with the international treaty on climate change, the Paris Agreement, the UK committed to an interim target of a 68% reduction in economy wide greenhouse gas emissions by 2030, from 1990 levels. The Climate Change Act also commits the UK to adapting to potential impacts of climate change, such as flooding, high temperatures and drought.

2.1.3. In pursuing delivery of its targets relating to Climate Change legislation the UK Government continues to review and update its view across the policy landscape. A summary of key aspects of current national policy is provided in Appendix A.

2.2 LOCAL PLANS AND NATIONAL POLICY

Commentary

- The Written Ministerial Statement of December 2023 discourages local energy efficiency standards that are set over and above existing Part L requirements
- In practice, this is discouraging targets to be set in terms of carbon performance relative to minimum requirements (so called ‘Merton rule’ style policies)
- Given that net zero design relies on minimising energy needs there is nothing preventing Local Plans from setting benchmark requirements for some building archetypes in terms of the intensity of energy (for example, kWh/m^2/yr for residential buildings) in design

2.2.1. A number of UK Government policy positions were outlined at the end of 2023 in the context of revisions to elements of the National Planning Policy Framework (NPPF). Details of planning policy matters are outlined in Section 3.

2.2.2. One aspect of this was an updated position regarding the general scope and approach anticipated of local authorities when reviewing and updating Local Plans. The Minister for Housing's statement of 13th December 2023 notes that:

- The previous 2015 Ministerial Statement is outdated given reference to Code for Sustainable Homes
- Existing Part L requirements and future standard revision in 2025 set appropriate standards for energy efficiency in terms of net zero buildings
- Local plans should be consistent with national policy. It is not expected that local energy efficiency standards go beyond national regulation
- If proposed, any such standards need to be:
  - Shown to be viable in respect of housing supply and affordability
  - Expressed as a % uplift of the Target Emissions Rate (i.e. calculated CO_2e emissions)

2.2.3. This Ministerial Written Statement directly addresses previous Local Plans where so called 'Merton Rule' style targets were included, requiring developers to achieve carbon emission performance targets over and above the threshold performance required in complying with Part L.

2.2.4. Current Part L requirements include three metrics of performance – Target Emission Rate [TER] (CO_2e per m^2), Fabric Energy Efficiency (kWh per m^2) and Primary Energy (kWh per m^2). The combination of metrics supports design decisions that follow an 'energy hierarchy' of minimising energy requirements (via fabric performance), seeking on-site generation (primary energy reduction) and overall carbon performance (TER).

2.2.5. Compliance with Part L, in contrast to previous regimes, now includes heat pumps as the assumed source of space heating (i.e. an electric heat source rather than natural gas). This links to wider energy sector decarbonisation targets and the ambition for net zero grid supplied electricity by 2035.

2.2.6. Achievement of a net zero home, therefore relies on minimising energy needs via efficient design, with space heating provided by a heat pump. Solar PV generation on-site can then meet all, or almost all, of the energy requirements. Reliance on grid electricity, rather than fossil fuels for space heating and hot water, provides a lower carbon source of energy.

2.2.7. This design rationale means that carbon performance is essentially tied to grid electricity decarbonisation. Without a mix of energy sources (natural gas and electricity typically) in design there is limited benefit in setting a TER performance target beyond Building Regulations requirements as described in the WMS.

2.2.8. There is value in minimising energy needs (kWh/m^2/yr) since the lower the energy needs of a new house then the easier it is to achieve net zero performance. In this sense, net zero homes think

about energy (kWh) rather than carbon ($kgCO_2e$). This is why design guidance issued by organisations such as LETI[1] and RIBA[2] discuss minimum energy performance targets.

2.2.9. While the WMS discourages additional carbon targets it does not explicitly discuss energy performance targets. It is therefore possible for Local Plans to encourage developers to seek energy performance targets expressed in absolute terms. Examples of such policies have been upheld in examination and recent adoption[3].

2.3 BOROUGH CONTEXT

Commentary

- HBC continue to drive low carbon behaviour across the Borough in order to achieve net zero GHG emissions by 2050
- In practice, GHG emissions attributed to Council service delivery make up a small element of overall Borough emissions
- A major challenge is decarbonisation of central heating given the majority of dwellings use natural gas: Borough wide, natural gas use accounts for around 33% of total emissions.
- Road transport emissions account for a further ~35% of total GHG emissions
- Continued work on decarbonisation of national grid supplied electricity will support reduction of this component of Borough emissions (~20% of total at present)

2.3.1. HBC acknowledged that Havant needs to respond swiftly to the nationally recognised need to reduce harmful carbon emissions in its climate declaration of May 2019. Its objectives in acting on this declaration are set out in the Climate Change and Environment Strategy (2021 – 2026).

2.3.2. The strategy provides a vision for HBC and its priorities for the focus of the next five years. It re-affirms two main objectives that will drive action:

- Achievement of net-zero GHG emissions within the Borough by 2050
- Protection and enhancement of the natural environment

2.3.3. It also underlines the extent to which HBC can influence future behaviour and actions in the community in driving a net zero future. It notes the fact that it is only with an inclusive approach, where everyone is involved in taking actions, that a net zero future can be achieved.

[1] Low Energy Transformation Initiative (LETI), Climate Emergency Design Guide available at https://www.leti.uk/cedg (Accessed August 2024)

[2] Royal Institute of Architects (RIBA), 2030 Climate Challenge Guide available at https://www.architecture.com/about/policy/climate-action/2030-climate-challenge?srsltid=AfmBOopMfOnDmdXK20w7vAVXDTIVuicRSoEf_3BmJZ4yO95iPbmoTQI0 (Accessed August 2024)

[3] See, for example, Cornwall and Bath & North East Somerset (BANES)

2.3.4. An important element of that influencing role is in development of the Local Plan, and associated local policies that support national targets while also being sympathetic to local requirements.

2.3.5. At a Borough-level, projected carbon budgets that mirror the pace of national targets are seen here.

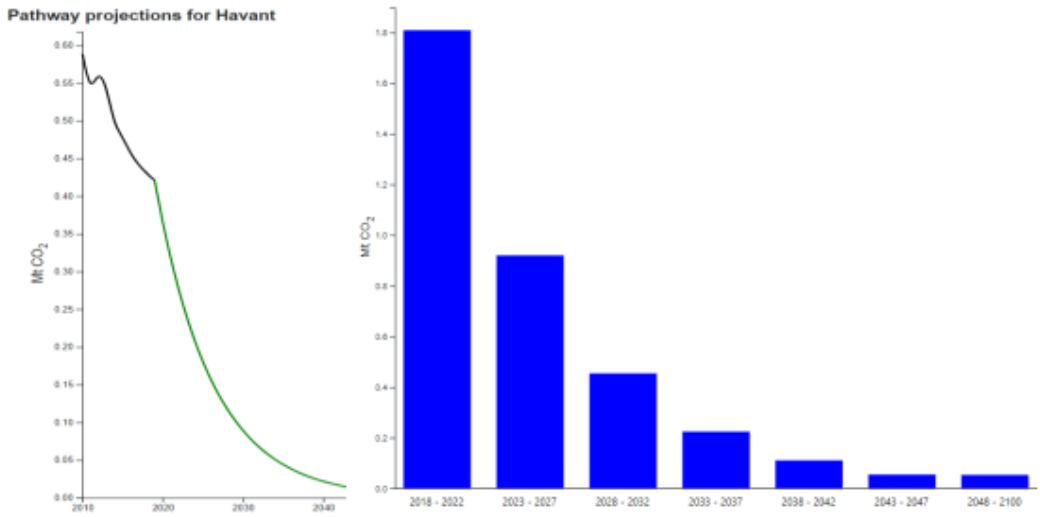


Figure 2-1 - Projected Carbon Budgets for Havant

2.3.6. At Borough level the challenges in meeting these longer-term net zero targets can be seen in reported GHG emissions.

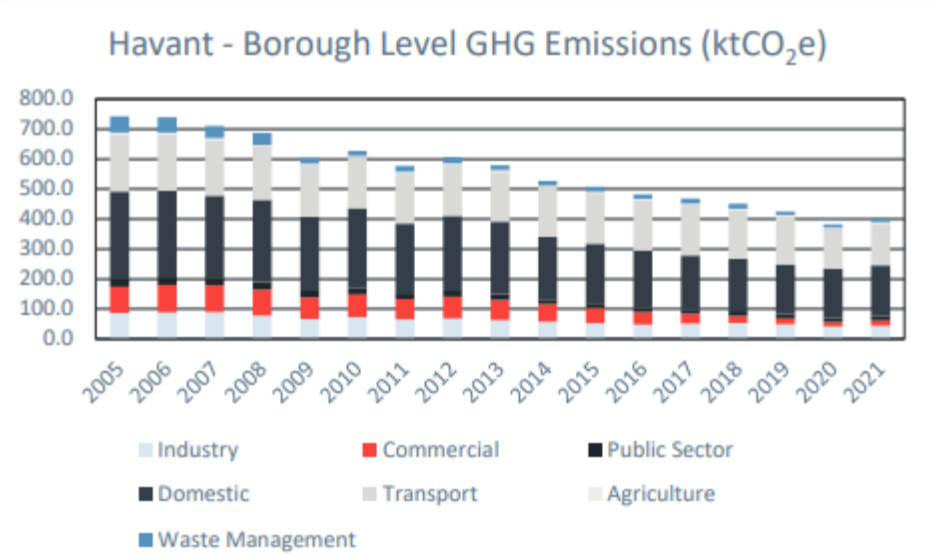


Figure 2-2 - Havant Borough GHG Emissions

2.3.7. In practice, the major contributors to Borough level GHG emissions can be summarised as:

- Natural gas (~ 33% of total Borough emissions)
- Grid Electricity (~ 20% of total Borough emissions)
- Road transport (~35% of total Borough emissions)

2.3.8. These emission sources will be reduced by action at a national scale as supply systems for natural gas and grid electricity evolve and the transition from traditional ICE vehicles continues.

2.3.9. Positive action in the Borough therefore relies on supportive policies that enable these national systemic changes to deliver locally. In that respect, it is enabling language that is key – ensuring that development coming forward in the Borough supports change, through, for example, adequate passive design measures, coherent landscape management to support adaptive resilience (mitigating flood risk, minimising overheating risk) and use of materials that minimise environmental impacts and maximise re-use, re-purposing and wider circular economy practices.

- A reduction in natural gas use needs supportive local policies to ensure energy efficient building designs (both new and majorly refurbished) in order to support a switch to use of heat pumps. This in turn needs a local grid electricity network that can enable this switch.
- A low carbon electricity grid needs supportive action to avoid overloading local networks and associated expensive upgrade works. Supportive policies enable development of renewable generation, integration of this into major developments, and associated energy storage systems that can support wider national objectives.
- Provision of EV charging infrastructure – as now included in Building Regulations nationally – is another element in decarbonising transport.
- Gas network infrastructure should not be over-looked, given a potential re-purposing for use in the supply of hydrogen that may have a future role in supporting low carbon buildings and transport.
- A variety of sustainability schemes promote good practice design (e.g. BREEAM for Non-domestic Buildings, Home Quality Mark for residential among others). How this can be used in a local context to promote good design and associated benefits in terms of the efficiency with which resources are used and associated waste management needs minimised is an important element of the future Local Plan

HOUSING PROFILE – HAVANT BOROUGH

Commentary

Future decarbonisation of the existing housing stock relies on support to private owners given no significant housing stock owned by the Borough Council.

A major challenge is decarbonisation of central heating given the majority of dwellings use natural gas: Borough wide, natural gas use accounts for around 33% of total emissions.

Given that the majority of dwellings are detached or semi-detached properties widespread use of communal or district heating is likely to be limited.

2.3.10. The latest Census data suggests that there are 53,600 households within the Borough[4].

2.3.11. The typical profile of an individual dwelling is summarised in Figure 2-3. The supporting statistics are provided in Table 2-1.

Figure 2-3 - Typical existing dwelling profile for Havant

	Archetype	Detached / semi-detached
	Ownership	Privately owned
	Number of bedrooms	2 or 3 bedrooms
	Number in household	1 or 2 people
	Central heating	Mains gas

[4] https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/bulletins/populationandhouseholdestimatesenglandandwales/census2021 (Accessed May 2024)

Table 2-1 – Existing dwellings (Havant Borough)

Type of Accommodation	Ownership
▪ **80.7% are whole houses or bungalows** • **28.3% detached** • **29.6% semi-detached** • **22.8% terraced** ▪ 18.9% are flats, maisonettes and apartments ▪ 0.4% are in a caravan or other mobile structure or temporary structure	▪ **68.7% of homes are owned outright or with a mortgage** • **38.9% of homes are owned outright** • **29.8% of homes are owned with a mortgage, loan or share ownership** ▪ 18.6% are socially rented ▪ 12.6% are privately rented or rent free
Household size	**Number of bedrooms**
▪ **29.8% are 1 person households** ▪ **37.2% are 2 person households** ▪ 15.1% are 3 person households ▪ 17.9% are 4 or more person households	▪ 10.5% 1 bedroom ▪ **25.6% 2 bedrooms** ▪ **44.1% 3 bedrooms** ▪ 19.8% 4 or more bedrooms
Central Heating	
▪ **80.8% have mains gas only central heating** ▪ **8.4% (two types excluding renewable energy)** ▪ **7% electric only** ▪ **2.2% other** ▪ **1.6% have no central heating**	

2.3.12. Havant Borough does not hold a housing revenue account and is not a registered social landlord. It retains 4,866 dwellings (<10% of total dwellings in the Borough).

PLANNING APPLICATIONS AND COMPLETIONS

Commentary

Historic annual completion rates make up less than 1% of the total housing stock in the Borough.

New housing completions are likely to be smaller development sites with fewer than 10 dwellings (based on typical planning applications received).

Technical evidence underpinning the Future Homes Standard suggests that there would be little impact from design decisions in terms of the number of dwellings achievable at a given site.

2.3.13. Existing dwellings contribute the vast majority of GHG emissions in terms of domestic emissions in the Borough.

2.3.14. It is important that new build residential property looks to achieve net zero design in order to avoid contributing further to the challenge of achieving net zero targets within the Borough.

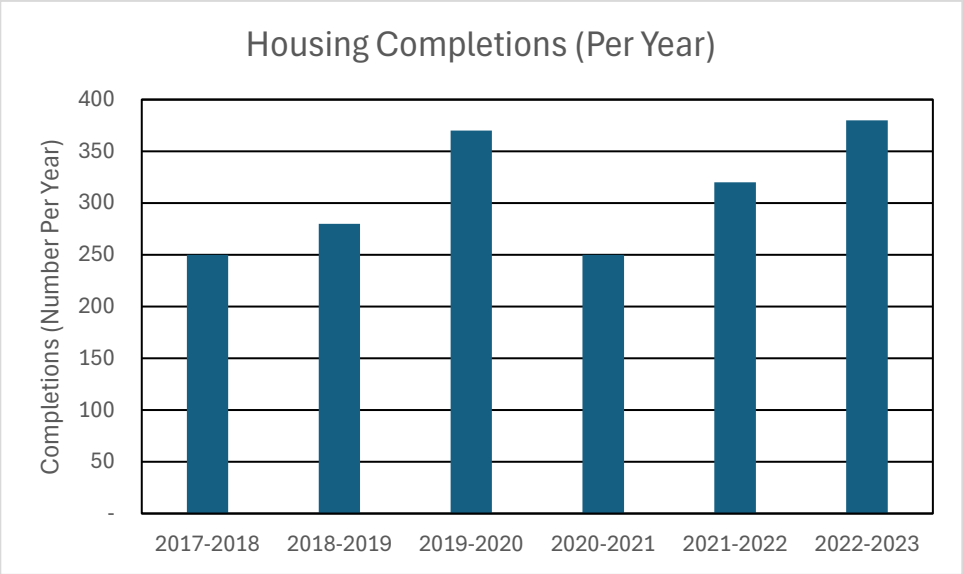
2.3.15. Data on annual completions in the recent past is available from the Office for National Statistics[5]. This amounts to a change of less than 1% in the total housing stock in a given year.

2.3.16. In terms of the number and scale of development applications, it is useful to consider the distinction between major and minor developments.

- A 'major development' is defined as:
  - Residential: The number of dwelling/houses to be provided is 10 or more; or the development is to be carried out on a site having an area of 0.5 hectares or more and it is not known whether the number of dwelling/houses to be provided is 10 or more
  - Non-residential: The provision of a building or buildings where the floor space to be created by the development is 1,000 square metres or more; or Development carried out on a site having an area of one hectare or more.
- A 'minor development' is defined as:
  - Residential: The number of dwelling/houses to be provided is between one and nine inclusive on a site having an area of less than one hectare; or a site area of less than 0.5 hectares (where the number of dwellings/houses is not known)
  - Non-residential: The floor space to be created is less than 1,000 square metres or where the site area is less than one hectare

5 https://www.ons.gov.uk/peoplepopulationandcommunity/housing/datasets/housebuildingukpermanentdwellingsstartedandcompletedbylocalauthority (Accessed May 2024)

Figure 2-4 - Completion Rates (Havant Borough)



2.3.17. Looking at the number of major and minor applications gives an idea of the design challenges associated with delivering net zero new developments. More major developments mean larger-scale footprints, more dwellings (or larger non-residential buildings) and so design impacts concentrated within relatively few individual sites. More minor developments mean a larger number of development sites and potentially more brownfield or windfall sites with a smaller number of dwellings (or smaller non-residential buildings).

2.3.18. Statistics for application decisions made by Havant Borough Council in the calendar year 2023 are summarised here[6].

Table 2-2 – Planning application data (2023)

	2023 Q1	2023 Q2	2023 Q3	2023 Q4
Total decisions (all applications)	132	146	138	112
Total decisions (major applications)	2	1	2	2
Total decisions (minor applications)	24	26	22	23
Total decisions (other)	106	119	114	87

[6] https://www.gov.uk/government/statistical-data-sets/live-tables-on-planning-application-statistics (Accessed May 2024)

Commentary

Evidence base studies for the Future Homes Standard show that existing available market solutions are capable of delivering net zero homes.

Fabric efficiency, and required wall thicknesses, have little impact on plotting (and therefore achievable dwelling numbers) for any given development site.

No consensus on development costs of different design approaches was achieved; only Passivhaus design standards are recognised as requiring a cost premium. Experience from the previously proposed Code for Sustainable Homes is that additional costs will fall as the supply chain responds to developer demand.

As with existing Part L requirements, a range of metrics were needed to fully describe building performance. Within its analysis, the report proposed a potential absolute energy performance indicator of 30 kWh/m^2/yr.

2.3.19. While there may be a variety of housing archetypes brought forward in the Borough, it is likely that future development will broadly retain the character of the existing housing stock. This would suggest provision of detached or semi-detached housing with 2/3 bedrooms.

2.3.20. Work by the Future Homes Hub provided an evidence base for the emerging Future Homes Standard[7]. This examined several potential approaches to housing design in considering what would be needed to achieve net zero development.

2.3.21. A number of specifications were considered, with choices of options across six design elements:

- Fabric performance
- Windows
- Ventilation
- Space heating
- Energy systems
- Renewable generation

2.3.22. Five specifications (termed ‘contender specifications’) were developed and tested for seven archetypes ranging from terraced houses, detached houses and apartment blocks.

2.3.23. All technologies and approaches considered currently exist in the market; higher levels of energy efficiency required more wall insulation and therefore thicker walls. Even in the case of a doubling of wall thickness it was shown that this would have a marginal impact on plotting for a given site.

2.3.24. Indicative costs associated with development resulted in a wide range of estimates. Where Passivhaus design is adopted, this incurs significant additional costs associated with the combination of heat pump, mechanical ventilation and heat recovery and co-ordination of air

[7] ‘Ready for Zero, Evidence to inform the 2025 Future Homes Standard’, Task Group Report, Future Homes Hub (February 2023) available at https://www.futurehomes.org.uk/ (Accessed May 2024)

tightness testing on-site. This was estimated, in total, to be somewhere in the region of +10% - +19% measured against current Building Regulations. However, experience from the proposed Code for Sustainable Homes adoption suggests that cost uplifts significantly reduced as the wider supply chain responded to developer requirements.

2.3.25. The report also looked at the potential use of absolute energy intensity targets for future builds (measuring energy needs as kWh/m^2/yr). Modelling in the report looked at the impact of form versus the selection of measures used in design. This recognises that as form factor increases (low for terraced houses, high for detached houses and bungalows) so energy efficiency decreases. The findings showed little difference in terms of form and that the design decisions more directly influenced energy performance. However, at Passivhaus levels of performance, form factor could become more significant.

2.3.26. As with existing Part L requirements a range of metrics were needed to fully describe building performance. Within its analysis, the report proposed a potential absolute energy performance indicator of 30 kWh/m^2/yr. This was a performance level that provided a balance between the selection of design measures for any given development and the impact of form factor on energy performance.

2.3.27. In summary, higher standards of energy efficiency (and therefore lower absolute energy requirements in design) are achievable without any significant impact on plotting within a given site. The overall energy performance of residential builds is most heavily influenced by design decisions, rather than form factor, other than in targeting Passivhaus performance for specific archetypes. The required technologies and approaches to achieving net zero homes are already available in the market. This means that assessing site viability ultimately rests on good practice approaches to design, rather than being dependent on cost premiums associated with innovation and the introduction of new technologies or design methods.

3 SUSTAINABILITY THROUGH STANDARDS

3.1 BUILDING REGULATIONS

Commentary

The Future Homes Standard and Future Buildings Standard will introduce more stringent requirements of performance in 2025.

Design of homes now needs to consider, not only the Target Emission Rate (TER) in terms of carbon, but also the primary energy needs (Primary Energy Rate) and fabric efficiency (Fabric Energy Efficiency).

Non-residential buildings must meet the Target Emission Rate (TER) and also the primary energy needs (Primary Energy Rate). BREEAM provides one rating scheme that can be used to assess the holistic sustainability of a non-residential development.

General permitted development rights support the integration of heat pumps and rooftop solar PV within future development.

3.1.1. In June 2022, significant changes in the Building Regulations[8] came into effect for new homes, extensions, existing buildings and non-domestic buildings. New homes and buildings in England will have to produce significantly less carbon dioxide (CO_2) under new rules. Under the new Regulations, CO_2 emissions from new build homes must be 31% lower than current standards and emissions from other new buildings, including offices and shops, must be reduced by 27%. Amendments include:

- Part F (ventilation)[9] and Part O (overheating)[10] – uplift to ventilation and solar gain reduction requirements to avoid the issue of overheating (see Section 4.2);
- Part L (conservation of fuel and power)[11] – setting standards for the energy performance of new and existing buildings (see Section); and
- Part S (infrastructure for charging electric vehicles)[12] – specification for the installation of electric vehicle (EV) charging points or cable routes (see Section 7.2).

[8] The Building Regulations 2010 No. 2214. Available at: https://www.legislation.gov.uk/uksi/2010/2214

[9] Ministry of Housing, Communities & Local Government (2022). Ventilation: Approved Document F. Available at: https://www.gov.uk/government/publications/ventilation-approved-document-f

[10] Ministry of Housing, Communities & Local Government (2022). Overheating: Approved Document O. Available at: https://www.gov.uk/government/publications/overheating-approved-document-o

[11] Ministry of Housing, Communities & Local Government (2022). Conservation of fuel and power: Approved Document L. Available at: https://www.gov.uk/government/publications/conservation-of-fuel-and-power-approved-document-l

[12] Ministry of Housing, Communities & Local Government (2022). Infrastructure for charging electric vehicles: Approved Document S. Available at: https://www.gov.uk/government/publications/infrastructure-for-charging-electric-vehicles-approved-document-s

3.1.2. These updates mark a steppingstone towards the introduction of the Future Homes Standard[13] and Future Buildings Standard[14] in 2025, which will introduce more stringent changes to Parts L and F.

3.1.3. Within these revised standards is also a shift in how compliance with these standards is measured. Previously, compliance in design was measured in terms of the modelled CO_2e emissions from the proposed building, measured relative to a so-called notional building benchmark. Compliance was demonstrated where the proposed building could achieve the required Target Emission Rate (TER). The notional building, by default, presumed the use of a natural gas boiler to provide space heating and cooling.

3.1.4. Local planning authorities, in assessing requirements, were able to include in local policies an uplift in minimum compliance requirements regarding these TERs. These so -called 'Merton-type rules' (in reference to the first authority to use such requirements) typically stated a % uplift over and above current Building Regulations that any proposed development would be required to meet.

3.1.5. Current Building Regulations now focus on three performance metrics. In addition to the TER (measured as projected CO_2e/yr) there is also a target fabric efficiency (TFEE) for domestic buildings and a target primary energy rate (TPER) for both domestic and non-domestic buildings. These reflect the reality of net zero design, in driving high fabric efficiency and an overall reduction in energy needs so as to achieve the required low emission performance. Notional buildings now presume use of heat pumps (rather than natural gas appliances) by default.

3.1.6. The Minister for Housing's statement of 13th December 2023 notes that:

- The previous 2015 Ministerial Statement is outdated given reference to Code for Sustainable Homes
- Existing Part L requirements and future standard revision in 2025 set appropriate standards for energy efficiency in terms of net zero buildings
- Local plans should be consistent with national policy. It is not expected that local energy efficiency standards go beyond national regulation
- If proposed, any such standards need to be:
- Shown to be viable in respect of housing supply and affordability
- Expressed as a % uplift of the Target Emissions Rate (i.e. calculated CO_2e emissions)

3.1.7. Given the range of metrics, rather than a single focus on TER, a specific local TER requirement is of limited value.

3.2 BREEAM

3.2.1. Among voluntary measurement ratings for green buildings, the Building Research Establishment (BRE) Environmental Assessment Method (BREEAM) has become one of the most comprehensive

[13] Ministry of Housing, Communities & Local Government (2021). Consultation outcome: The Future Homes Standard: changes to Part L and Part F of the Building Regulations for new dwellings. 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

[14] Ministry of Housing, Communities & Local Government (2021). Consultation outcome: The Future Buildings Standard. Available at: https://www.gov.uk/government/consultations/the-future-buildings-standard

and widely recognised measures of a building's environmental performance. BREEAM UK New Construction Version 6 describes an environmental performance standard against which new, non-domestic buildings can be assessed.

3.2.2. In order to achieve a BREEAM 'Very Good' rating, a building must achieve the minimum standards of performance in the key areas described in Table 3.1 (to guarantee performance against fundamental environmental issues), in addition to the minimum score of 55%.

Table 3-1 – BREEAM Very Good Minimum Scoring

BREEAM Issue	Minimum Standard	Further Guidance	Manual Section
Man 04 Commissioning and handover	One credit (commissioning-test schedule and responsibilities)	A schedule of commissioning and testing must be produced, in accordance with appropriate standards such as current Building Regulations, Chartered Institution of Building Services Engineers (CIBSE) guidelines, amongst others.	59
	Criterion 11 (Building User Guide)	Prior to handover, develop two building user guides for non-technical users for occupiers and for the facilities managers.	61
Ene 02 Energy monitoring	One credit (First sub-metering credit)	Sub-metering to be installed so that at least 90% of the estimated annual energy consumption of each fuel is assigned to its end-use category. The energy consumption will be monitored by end-use category if the total useful floor area is > 1,000 m^2. Below this area, an energy monitoring and management system could be used, or separate accessible sub-meters.	148
Wat 01 Water consumption	One credit	Utilising the BREEAM Wat 01 calculator or alternative method to compare the water consumption (litres/person/day) for the building against a baseline. At least a 12.5% improvement must be demonstrated. The yield of	208

		any greywater and rainwater systems can be offset from the demand.	
Wat 02 Water monitoring	Criterion 1 only	A water meter must be installed on the mains water supply to the building, including via a borehole or private source.	219
Mat 03 Responsible sourcing of construction products	Criterion 1 only	100% of timber and timber-based products used on the project will be 'legal' and 'sustainable' in accordance with the UK Government's Timber Procurement Policy.[15]	249

3.3 BIODIVERSITY NET GAIN

3.3.1. Under Schedule 7A of the Town and Country Planning Act 1990 (as inserted by Schedule 14 of the Environment Act 2021), biodiversity net gain (BNG) is a now a requirement of new developments. A minimum 10% improvement must be demonstrated in measuring the pre-development baseline in comparison with the post-development position.

3.3.2. A Biodiversity Gain Plan must be submitted and approved prior to commencement of works. This includes use of the associated statutory biodiversity net gain tool in calculating the net BNG figure.

3.3.3. Exemptions apply in the case of smaller-scale development (either where the site is smaller than a Hectare with 9 or fewer dwellings, or where the site is less than 0.5 Ha and the number of dwellings is unknown). Non-domestic buildings where the proposed gross floor area is below 1,000 m^2 or the development site is less than 1 Ha are also exempt.

3.3.4. Policy guidance from UK Government notes that plan makers should not request a figure in excess of 10% 'unless justified'.

3.3.5. Further details relating to BNG are provided in the Borough Council's separate Biodiversity Strategy.

3.4 GENERAL PERMITTED DEVELOPMENT

3.4.1. The General Permitted Development (England) (Amendment) Order 2024 effective from 5th March 2024 revises requirements associated with so called Class MA development (commercial, business and service uses to dwellinghouses – Class E to C3). The previous upper limit of what is

[15] Defra (2013). UK Government Timber Procurement Policy (Fifth Edition) (Online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/320982/2013_05_08_-_CPET_Deft_Legal___Sustainable_5th_ed_-_Final.pdf

developable (1,500 m^2) has been removed. It is also no longer a requirement that there has been a tenancy vacancy of at least 3 months on the building proposed for development.

3.4.2. A February 2024 consultation seeks views on strengthening planning policy for brownfield development. The proposed wording includes 'give significant weight to the benefits of delivering as many homes as possible….to be as flexible as possible… especially for proposals on brownfield land'.

3.4.3. Air source heat pumps on domestic premises are considered to be permitted development in meeting specific limits and conditions:

- The installation must comply with the Microgeneration Certification Scheme Planning Standards or equivalent
- All parts of the air source heat pump must be at least one metre from the property boundary
- Installations on pitched roofs are not permitted development. If installed on a flat roof all parts of the air source heat pump must be at least one metre from the external edge of that roof
- The volume of the air source heat pump's outdoor compressor unit (including housing) must not exceed 0.6 cubic metres
- If more than one heat pump is installed at a given property then only the first installation is considered permitted development
- Conservation Areas, World Heritage sites, Scheduled Monuments and Listed Buildings have further specific requirements

3.4.4. Ground source heat pumps are also typically permitted development on domestic premises.

3.4.5. Solar PV panels are also subject to permitted development on domestic premises if:

- On a pitched roof, panels are not installed above the highest part of the roof (excluding the chimney) and project no more than 200 mm from the roof slope or wall surface.
- On a flat roof the highest part of the solar PV equipment is not more than 600 mm higher than the highest part of the roof (excluding chimney).
- The panels are not installed on a building that is within the grounds of a listed building or on a site designated as a scheduled monument.
- If in a conservation area, or in a World Heritage Site, panels are not fitted to a wall which fronts a highway.

3.4.6. Stand alone ground-mounted arrays are also permitted development if:

- No part of the installation is higher than four metres.
- The installation is at least 5 m from the boundary of the property.
- The size of the array is no more than 9 square metres or 3 m wide by 3 m deep.
- Panels are not installed within the boundary of a listed building or a scheduled monument.
- if your property is in a World Heritage Site, no part of the solar installation should be nearer to any highway bounding the house than the part of the house that is nearest to that highway.

3.4.7. In the case of commercial premises up to 1 MW capacity of solar PV can be installed on buildings. Requirements are:

- Roof-mounted or wall-mounted commercial solar panels should project no more than 200 mm from the wall surface or roof slope
- With pitched roof and flat roof installations, the panels need to be situated at least 1 m from the external edges of the roof, or the wall joint that they sit on
- With flat roof installations only, the roof-mounted panels should protrude less than 1 m from the roof surface, and they cannot be the highest part of the roof (excluding the chimney)

4 CARBON AND ENERGY EFFICIENCY

Commentary

Achievement of net zero design in new homes means reducing the overall energy required in its operation and meeting as much of this demand as possible through solar PV generation on site.

It is once this energy balance is determined that the net carbon assessment can be completed, and any further offset needs determined.

The carbon intensity of energy use is simpler to determine given presumed use of electricity for all energy needs (space heating, hot water, lighting and small power).

Design efforts therefore focus on overall energy use (kWh/m^2/yr) first, rather than Part L compliance calculations of carbon emissions (as in previous Building Regulation regimes).

4.1 ENERGY EFFICIENCY

4.1.1. Net zero development requires effective use of the energy hierarchy to design out our need for energy in the first place. Previously, design was concerned only with regulated energy (space heating, hot water and lighting) and meeting associated performance targets in terms of GHG emissions. In net zero design, not only is the building design concerned with meeting energy efficiency and carbon targets, but also in enabling a net zero development. In other words, design needs to consider all sources of energy demand (regulated and unregulated) rather than only regulated.

4.1.2. New and redeveloped buildings should be built to high environmental standards and are encouraged to exceed minimum local planning policy and Building Regulations requirements. Whilst the 2016 Zero Carbon Homes target has been replaced with the Future Homes Standard, new residential development is encouraged to pursue net zero standards where feasible.

4.1.3. The best and easiest way to reduce carbon emissions in any new development is to reduce the energy requirements once in use to a minimum. Once appropriate design features are integrated then low carbon energy generation options can be considered for adoption. The energy hierarchy in Table 4.1 will help guide decisions about which energy measures are appropriate in particular circumstances.

Table 4-1 - Energy Hierarchy

Stage	Description	Sustainability
Reduce the need for energy (LEAN)	The site layout and orientation of buildings can reduce the energy demand of buildings by capitalising on passive solar gain for heat and light.	**Best**
Use energy efficiently (LEAN)	There are a range of measures that can be incorporated which help save and efficiently use energy, including thermal efficient glazed windows, draught proofing, insulation, and energy efficient appliances (e.g. light fitting**s)**.	
Supply energy efficiently (CLEAN)	Greenhouse gas (GHG) emissions can be significantly reduced by using existing energy supplies more efficiently e.g. by distributing waste heat energy via power networks or using decentralised energy networks (DEN)	
Use renewable energy (GREEN)	Incorporate technologies that obtain energy from natural sources such as the wind, water and sun (renewable energy sources)	**Worst**

4.1.4. If our homes and businesses do not need as much power and heat to operate, this, in turn, will have a positive impact for the occupier through reduced energy bills.

4.1.5. The 'fabric first' approach prioritises improvement of thermal properties of the building fabric via high levels of thermal insulation and air tightness. This follows the hierarchy above, where increased performance of the fabric of the building can improve the efficient use of energy, then followed by increases of various energy systems (e.g. heating and hot water). If done in a retrofit context, then re-sizing of systems may be necessary, but this should come after the fabric stage (particularly prior to heat pump installation). Other examples of design could also include shading design, natural daylighting, natural ventilation and appropriate sizing of building systems.

4.1.6. The Building Regulations Approved Document[16] provides the full technical guidance regarding standards for the energy performance of new and existing buildings in Part L. 'Primary energy' will be used in combination with CO_2 metrics to assess compliance with Part L. Primary energy calculations take into account factors such as the efficiency of the building's heating system; power station efficiency for electricity; and energy used to produce fuel and deliver it to the building. Part L also includes specific guidance on energy efficiency in conservation areas.

4.2 AIR TIGHTNESS AND PASSIVHAUS

4.2.1. Part of good practice design in terms of energy efficiency is the ability to control air change rates in a building. The latest Part L requirements for domestic properties set an air permeability limit of 8 $m^3/hr.m^2$. In practice, when measuring compliance against the notional building the baseline is set at 5 $m^3/hr.m^2$.

[16] Documents available at https://www.gov.uk/government/publications/conservation-of-fuel-and-power-approved-document-l (Accessed August 2024)

4.2.2. Part F of Building Regulations deals with ventilation requirements, that are linked to the air permeability achieved. While natural ventilation will be typically used, lower air permeability may require use of mechanical ventilation in order to achieve adequate air change rates within the house.

4.2.3. Achieving air tightness performance requires a continuous airtightness layer in the floors, walls and roofing. This is achieved through a combination of:

- Sealing the doors, windows and rooflights to the adjacent building envelope
- Linking the junctions between walls and floor and between walls and the roof, including the perimeter of any intermediate floor
- Sealing penetrations through the air barrier, including:
    - Incoming water, gas, oil, or district heating pipes
    - Ventilation ducts
    - Electric and broadband
    - Chimneys and flues

4.2.4. Passivhaus design[17] provides for the most stringent air tightness and permeability requirements. This design approach takes a whole house view, designing out energy requirements by ensuring highly insulated fabric reducing space heating demand to no more than 15 kWh/m^2/yr.

4.2.5. The PHPP software tool provides a means of modelling:

- Heating demand per year [kWh/(m²a)] and maximum heating load [W/m²]
- Cooling demand per year [kWh/(m²a)] and maximum cooling load [W/m²] (in case of active cooling)
- Summer comfort in case of passive cooling: frequency of overheating [%]
- Demand for renewable primary energy (PER) per year and primary energy demand (PE) of all energy services in the entire building

4.2.6. Design work can be fully certified to the Passivhaus Standard. Alternatively, the design can be aligned to Passivhaus principles, meaning that a given development follows similar design requirements, but does not necessarily achieve certifiable standards of performance.

4.2.7. Workmanship in achieving the airtightness layer within the building and care in avoiding thermal bridges and weaknesses due to penetrations in the fabric for service runs etc, is key to the successful implementation of Passivhaus standards.

4.3 DETERMINING NET ZERO

4.3.1. The majority of developments will consider net zero in the context of operation. This means that there needs to be accounting for all energy use on an annual basis, as well as measurement of any on-site generation. Net zero in operation will be achieved if the GHG emissions from energy use are

[17] https://www.passivhaustrust.org.uk/ (Accessed March 2024)

balanced by the scale of on-site generation. In practice this may not be achievable and there will be some remaining GHG emissions (residual emissions). Achieving net zero would require offset of these residual emissions through investment in a suitable scheme.

4.3.2. For any given new building, or housing development, it is therefore important that there is adequate metering of energy supplies and all sources of renewable generation located on-site.

4.3.3. Post occupancy monitoring can be considered for larger housing developments or commercial premises with multiple tenants. Forms of agreement are available, that facilitate sharing of anonymised meter data to enable net zero calculations to be performed. These agreements avoid any issues with equity, in terms of penalising homes or commercial tenants who are higher energy users.

5 DESIGN, MATERIALS AND WASTE

Commentary

Just as the 'energy hierarchy' supports good practice design in net zero homes, the 'waste hierarchy' equally applies.

Good practice in development seeks to re-use existing materials as far as possible so as to minimise the amount of materials needed and the impacts of their transport to site. This discourages demolition that isn't coupled with significant amounts of reclamation and re-use/re-purposing.

Modular design approaches, with varying levels of pre-fabrication from individual components to whole structural envelopes, can support waste minimisation and resource efficiency in development.

Design of new development needs to incorporate the capacity to collect different waste streams and therefore enable recycling.

5.1 WASTE

5.1.1. Sustainable waste management is guided by the 'waste hierarchy' as set out in UK law within the Waste (England and Wales) Regulations 2011[18]. The steps are set out in Table 5.1. Preventing waste is the preferred option and sending waste to landfill should be the last resort. The design of neighbourhoods and supporting services should encourage and enable communities to follow the waste hierarchy.

[18] The Waste (England and Wales) Regulations 2011 No. 988. Available at: https://www.legislation.gov.uk/uksi/2011/988/contents/made

Table 5.1 Waste Hierarchy[19]

Stage	Description	Sustainability
Prevention	Use less material in design and manufacture. Keeping products for longer; re-use. Using less hazardous material.	**Best**
Preparing for re-use	Checking, cleaning, repairing, refurbishing, whole items or spare parts.	
Recycling	Turning waste into a new substance or product. Includes composting if it meets quality protocols.	
Other recovery	Includes anaerobic digestions, incineration with energy recovery, gasification and pyrolysis which produce energy (fuels, heat and power) and materials from waste; some backfilling operations.	
Disposal	Landfill and incineration without energy recovery.	**Worst**

BUILDING MATERIALS AND CONSTRUCTION WASTE

5.1.2. Development proposals should contribute towards reducing and recycling construction waste, and work towards 'designing out waste'. The best opportunities for improving materials resource efficiency occurs at the design stage of a development project. Implementing these opportunities can provide significant reductions in cost, waste and carbon. Circular economy principles should be applied in selecting materials, products and systems for a development, considering how these are sourced, and how they can be successfully reused, repaired, refurbished and recycled through their serviceable life.

5.1.3. Use of materials should be minimised as far as possible. The selection of materials should be informed by the scale of embodied carbon associated with their production. Examples of high embodied carbon materials include concrete and steel, which could be replaced with lower carbon alternatives like timber. BRE provide a free to use Green Guide[20] which examines the relative environmental impacts of construction materials.

5.1.4. Environmental Product Declarations (EPDs) and similar data available from suppliers, provide a third-party verified assessment of the relative GHG emissions (carbon impacts) of specific products. Locally sourced materials which reduce the carbon impacts of transport should be used where possible. Consider whether contractors and suppliers have environmental policies, a good track record in high environmental performance or any environmental accreditation.

5.1.5. Look to re-use materials from the development site and reclaimed or recycled materials for a range of uses. Re-use of building materials is more environmentally friendly than recycling. The demolition of buildings should be minimised as far as possible and materials derived from any demolition

[19] Department for the Environment, Food and Rural Affairs (2011). Guidance on applying the Waste Hierarchy. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69403/pb13530-waste-hierarchy-guidance.pdf

[20] Available at: https://tools.bregroup.com/greenguide/podpage.jsp?id=2126

should be re-used, such as crushed concrete and hardcore as aggregate in the new foundations. The retrofit of existing buildings is encouraged, this has multiple tangible environmental benefits alongside reducing carbon emissions.

5.1.6. Consideration should also be given as to whether the materials are resilient to expected changes in climate (see Section 6.2). Resilient building materials will minimise the need to replace materials, reducing embodied carbon and waste.

RECYCLING

5.1.7. The transport, treatment and disposal of waste are all energy demanding activities and contribute to harmful GHG emissions. Developers are expected to ensure the design and layout of new developments supports sustainable waste management; and will be encouraged to take measures over and above the statutory requirements.

5.1.8. In the design phase the provision for the storage, collection and recycling of waste needs to be considered carefully. Developments can provide facilities for individual or groups of properties or premises for the source separation of and storage of different types of households and business waste for collection. To reduce the volume of refuse requiring collection, individual or community composting facilities should also be included in developments. All waste facilities should be of high quality, should be visually attractive and should not detract from their immediate surroundings.

5.1.9. Larger scale developments provide an ideal opportunity to demonstrate how waste management facilities can be successfully integrated into the townscape. Innovative waste management systems are now available, such as piped underground refuse collection systems. These can have a significant effect on the design of a development and can encourage segregation and recycling.

SITE WASTE MANAGEMENT PLAN

5.1.10. Applications for large scale development[21] should be accompanied by a Site Waste Management Plan (SWMP) that clearly sets out how waste produced during all stages of a development will be minimised and managed in a sustainable manner. A SWMP should both contain target rates for recycling and define processes to manage different waste streams. The impacts of the processes involved in the recycling or reuse of wastes on site will be considered when determining the acceptability of the proposed development. Designing out waste is a key element of good practice in the preparation of a SWMP. Some projects will require SWMPs in order to comply with BREEAM standards.

5.1.11. A number of tools have been developed to assist constructors, such as BRE's web-based tool SmartWaste[22] (which can be aligned to BREEAM). It can be used on all types of construction project including new build and refurbishment, and suits both large and small construction projects, domestic or commercial.

[21] Under the Site Waste Management Plans Regulations 2008, all construction projects in England worth over £300,000 were required to have a SWMP in place before a project could begin. These Regulations were repealed, but the Council continues to strongly encourage such sites to undertake SWMPs.

[22] Further information available at: https://www.bresmartsite.com/products/smartwaste/

5.2 MODULAR DESIGN

5.2.1. Modular build techniques provide a route to ensuring replicable performance of building fabric and air tightness. Modular and timber-frame houses are assembled using primary elements that are pre-manufactured offsite. Assembly on site is then carried out on a prepared foundation.

5.2.2. A modular approach also allows for future expansion, given the ability to interlink further sections or modules to the existing superstructure.

5.2.3. It is feasible to construct a single house in 7 – 10 days if a full modular design is deployed.

5.2.4. In larger developments, or extensive retrofits, it is feasible to use pre-manufactured elements rather than for the whole building. This could include, for example, pre-manufactured bathroom and kitchen pods for blocks of flats or multiple dwellings, or use of pre-cast facades for low rise buildings or commercial premises.

5.2.5. While domestic properties will typically be of permanent modular construction (i.e. designed to be integrated on a development site permanently) it is also possible to build relocatable buildings. Relocatable buildings are designed to be reused or repurposed multiple times and transported to different building sites. The modular design process means these can be highly energy efficient and compliant with Building Regulation requirements.

5.3 MEASURING CIRCULARITY

5.3.1. The benefits of circularity in terms of better use of resources and lower carbon impacts in construction of buildings are well understood[23]. However, there is not yet an industry consensus as to how this can be measured consistently at an individual building level. Recent work[24] identified a list of metrics that can be considered further in working towards a set of agreed performance metrics (Table 5-2). No formal proposal for adoption of any of these metrics is currently proposed at national level.

[23] See, for example, UKGBC (2022) Insights into how circular economy principles impact carbon and value. Available at: https://www.ukgbc.org/ukgbc-work/how-circular-economy-principles-can-impact-carbon-and-value/ (Accessed August 2024)

[24] UKGBC Circular Economy Forum 2021-2023 – Circular Economy Metrics for Buildings available at https://ukgbc.org/wp-content/uploads/2023/03/Circular-Economy-Metrics-Paper.pdf (Accessed August 2024)

Table 5-2 – Potential circularity metrics

#	Performance Metric	Description	Quantitative metric
1	Dematerialisation – Upfront	Delivering the same product using a lower percentage of mass or material types in the product. This is achieved by optimisation – maximising resource effectiveness by reducing the mass or material types in the product.	(kg/m^2 GIA) Total mass of building interventions by building layer normalised by the Gross Internal Area.
2	Dematerialisation – Life Cycle	Delivering the same product using a lower percentage of mass or material types in the product. This is achieved by optimisation – maximising resource effectiveness by reducing the mass or material types in the product.	(kg/m^2 GIA) Total mass of building interventions by building layer normalised by the Gross Internal Area.
3	Design for Disassembly & Re-use	The design of materials, products and components or systems to allow ease of disassembly at end of use/life for reuse, repurpose or remanufacture.	(% tonnes) The percent of total mass of materials, products and components or systems for the new build / refurbishment / fit-out that have been designed for disassembly.
4	Material Reused, Remanufactured or Recycled	Reused: Materials, products and components/systems that are reused in their current form. Remanufactured: Materials, products and components/systems which are an upgraded version of the original or manufactured into something new. Recycled: Materials, products or components/systems which are reprocessed into substances which can be used in the production process of the original material, product or component/system or for other production purposes.	(% Tonnes) The percent of total mass of materials, products and components/systems for the new build / refurbishment / fit-out that have been reused, repurposed or remanufactured, either from the building undergoing demolition, refurbishment, fit-out or from other buildings, third parties etc
5	Material Database and Passports	The collation of materials properties digitally, that when accessed in the future, will provide the information required to increase the likelihood of materials being reused, repurposed or remanufactured at end of use/life.	(% Tonnes) The percent of total mass of materials that have been tagged to allow access to the materials database.
6	Design for adaptability (transformation capacity)	The ability to be changed or modified to make suitable for a particular purpose (ISO 20887).	(% Area) The percentage area of total building that has been designed for adaptability.

#	Performance Metric	Description	Quantitative metric
7	Embodied Carbon	Total greenhouse gas emissions associated with the materials incorporated into a building from cradle to grave. This includes emissions associated with the product stage (raw material extraction, transport and material processing), construction stage (transport and installation processes), in-use stage (use, maintenance, repair, replacement, refurbishment) and end of life (de-construction, transport, waste processing and disposal).	($kgCO_2e/m^2$ GIA) Mass of carbon dioxide equivalent per meter squared of gross internal floor area.

6 CLIMATE CHANGE RESILIENCE AND ADAPTATION

Commentary

The resilience of new developments to a changing climate is an important element of design.

Resilience includes consideration of how to integrate sustainable urban drainage and greenspace within new development, as well as design to mitigate future overheating risk and efficiency in water use.

Effective use of natural features in development enhances resilience while also providing quality public space for community use.

6.1 INTRODUCTION

6.1.1. Consideration of climate change adaptation within the built environment is an amalgamation of discrete but connected issues such as overheating within buildings and thermal comfort, flood risk and sustainable drainage, water efficiency and reuse, the integration of Green and Blue Infrastructure (GBI), whilst designing for changing ground conditions, winds and damp.[25] Integration of these competing issues into sustainable design within development needs to be carefully considered, whilst complementing the requirements for climate change mitigation through energy efficiency.

6.1.2. Existing housing stock in the UK faces challenges in adequately addressing a changing climate, partly due to the age profile of buildings, but also due to 'issues with knowledge, skills, supply chains, occupant behaviour and quality assurance'25. Future-proofing of new development encourages well-designed sustainable development, with the ease of ability to adapt to changing environmental, social and economic conditions over the lifetime of the development.

6.1.3. The 2021 update to the NPPF sends the clear signal that climate change adaptation should be integral to new development:

> *"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 temperatures."*

[25] Kovats and Brisley (2021). UK Climate Risk Independent Assessment (CCRA3) Technical Report Chapter 5: Health, Communities and the Built Environment (Online). Available at: https://www.ukclimaterisk.org/wp-content/uploads/2021/06/CCRA3-Chapter-5-FINAL.pdf

6.2 ADAPTATION THROUGH DESIGN

RESILIENCE TO RISING TEMPERATURES

6.2.1. The latest assessment of the risks and opportunities facing the UK from climate change (UK CCRA3) noted limited incorporation of adaptation issues into planning policy as one of the significant barriers to addressing climate change risks.25

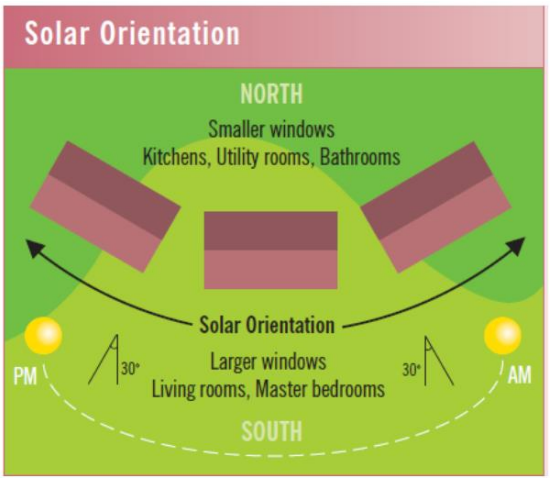
6.2.2. One of the major climate risks to the UK relates to high temperatures. The UK CCRA3 considers that the risks of combined exposure to high temperatures, air pollution, drought and wildfires could result in excess mortality. This is a higher risk for vulnerable community members such as those within residential care, older persons or persons with pre-existing conditions. Despite this, it notes that policies relating to the thermal comfort of occupied buildings were under-developed (see UK CCRA H1).

UK CCRA Risk H1: Risks to health and wellbeing from high temperatures.

While there is more evidence since CCRA2 about the risks of overheating in homes, hospitals and care homes, and the effectiveness and limitations of strategies for passive and space cooling, policies to protect people from overheating in new and existing homes and other buildings including care homes are still to be developed fully across the UK.

6.2.3. The design and layout of new development can make a significant contribution in minimising GHG emissions and therefore its contribution to climate change. Reducing the energy demand of a building or group of buildings through passive design techniques (such as massing, daylighting or form) will generally offer a sound basis for implementing LZC technologies cost effectively.

Figure 6.1 Optimum Solar Orientation



6.2.4. Solar energy can minimise the energy demand of buildings by reducing space heating demand; contributing to daylighting inside and outside, supply heat for solar heated hot water, and generate electricity with PV panels. To maximise passive solar gain, buildings should be oriented with the longest façade being south facing (+/- 30°) (see Figure 6.1). Overshadowing of buildings should be avoided as it reduces the heat gain from the sun in winter. Getting the right glazing-to-wall ratio on each façade is a key feature of energy efficient design: minimise heat loss to the north (smaller windows), while providing sufficient solar heat gain from the south (larger windows). This means prioritising occupied spaces with larger windows on the south (such as living rooms and bedrooms in residential buildings, for example).

6.2.5. Good integrated design will also avoid summertime overheating and provide future adaptation for a rise in temperatures. This is recognised in the introduction of Part O to Building Regulations, specifically addressing the risk of overheating in buildings. It is important that developers avoid maladapted design, where energy efficiency measures (e.g. to increase solar gain and reduce

winter heat loss) have the potential to exacerbate summer heat risks. New developments should be designed to reduce cooling load as far as possible using passive solutions (e.g. through planting and shading) and then find the best mechanical solution to meet any remaining cooling requirement.

6.2.6. The introduction of Approved Document Part O in 2022 directly addresses design of residential development. It directly addresses how to minimise unwanted solar gains in summer periods and ensure adequate removal of heat from the indoor environment.

6.2.7. The rationale in Part O recognises that buildings with increasingly efficient insulation and airtightness are at risk of overheating if their design does not adequately address ventilation requirements.[26] It therefore supplements Part F requirements for ventilation standards, while also promoting natural removal of heat so as to avoid additional energy requirements associated with mechanical systems, which would conflict with targets for reducing the energy intensity of dwellings set out in Part L.

BREEAM Exemplary performance in climate change adaptation

✓ **Hea 04** Thermal modelling results in thermal comfort, limiting the risk of overheating, taking into account future climate change projections within the modelling inputs.

✓ **Mat 05** Buildings are designed for durability and resilience to future environmental conditions with climate change.

6.2.8. Within non-residential buildings, the BREEAM UK New Construction and BREEAM Refurbishment and fit-out guidance sets out what exemplary performance with respect to climate change adaptation looks like. This includes criterion Hea 04 Thermal comfort, which addresses risks of overheating, alongside ventilation design.

6.2.9. Exemplary performance also includes avoiding increased risks of deterioration and higher maintenance demands due to the impacts of climate change previously mentioned (driving rain, winds, heat related deterioration). By achieving Mat 05 Designing for durability and resilience the development should demonstrate exemplary performance where the exposed parts of the building are protected from material degradation from environmental factors including climate change, where water ingress and damage is prevented. This includes designing for maintenance (e.g. ease of access for replacement, cleaning and repair).

6.2.10. Increased internal temperatures pose serious health implications.[27] Thermal discomfort within buildings is directly correlated with increasing external temperatures; however, a range of conditions are at play which may be individual to the occupier and there is no single value for indoor temperature which is considered comfortable. Therefore, it is imperative that building design allows for flexibility in removing heat from the building.

[26] Morten, W. (2015). Strategies for mitigating the risk of overheating in current and future climate scenarios: Applying lessons from PassivHaus to contemporary housing. (Online). Available at: https://www.passivhaustrust.org.uk/UserFiles/File/Technical%20Insight%20-%20December%202015%20-%20Mitigating%20Oveheating%20Risk%20in%20Future%20Climates.pdf

[27] Race, G. L. (2010). CIBSE Knowledge Series: KS16 How to manage overheating in buildings. London, England: Chartered Institution of Building Services Engineers.

6.2.11. In addition to whole-building consideration of overheating, there may be localised overheating associated with high glazing proportions, restriction of window opening, internal heat sources and a lack of shading objects.[28]

6.2.12. Window opening will become an increasingly ineffective method for cooling as external temperatures continue to increase. Shading and ventilation are key to naturally controlling overheating in the summer months; key design measures are within Table 6.1.

[28] Palmer, J. (2021). Avoiding summer overheating. Guidelines for summer comfort in PassivHaus buildings and the PHT Summer overheating tool. (Online). Available at: https://www.passivhaustrust.org.uk/UserFiles/File/Technical%20Papers/Avoiding%20summer%20overheating.pdf

Table 6.1 Types of cooling measures that can be incorporated into design of residential and non-residential buildings[26]

	Type of cooling	Examples
	Ventilation	Displacement ventilation, opening windows, night purging, breathing buildings
	Internal shading	Blinds, curtains, shutters, films on glass
	External shading, especially for south facing facades	Overhangs, shutters, Brise Soleil, recessed glazing, vegetation, fins
	Thermal mass	Exposed concrete floors and ceilings, thick stone/block walls on south/west facades, masonry partitions
	GBI	Green roof, green walls, planting around building, roof ponds
	Building form	Reduce glazing size, locate glazing away from sun, glazing to limit solar gain e.g. low g-value glass
	Reducing occupant input	Automatic controls
	Reflective	Reflective roof, solar control glass, white paint
	Active cooling	Air Conditioning units, reversible heat pumps.

6.2.13. Nature based solutions (NBS) can be applied at the property-level to address the impacts of overheating through natural shading with vegetation. Beyond overheating within buildings, the health and wellbeing of the population may become impacted by increasing experience of the urban heat island effect associated with urban areas. This has strong links with the integration of urban cooling measures such as green infrastructure and NBS, explored further in this section.

6.2.14. Further guidance in terms of design considerations can be found in the references noted here:

- Approved Document Part O: Overheating for further technical guidance.
- CIBSE, 2013. TM52 The limits of thermal comfort: avoiding overheating in European buildings.
- CIBSE, 2019. TM59 Design methodology for the assessment of overheating risk in homes.

RESILIENCE TO FLOOD RISK

6.2.15. The UK CCRA3 highlights the aspects of society which are, and could become more at risk, from flooding, this includes our services (Risk I2), people, communities and flooding (Risk H3) and businesses (Risk B1). Individual new developments need to ensure flood risk / resilience is a key consideration as part of local climate adaptation, accounting for projected future climate change in the design of any flood resilience measures. Designs also need to take into account the flood risk implications of impermeable materials associated with urban environments, such as concrete, asphalt and tarmac.

6.2.16. SuDS are designed to maximise benefits from the management of surface water, by controlling the quantity and quality of runoff as well as providing larger areas of GBI supporting enhanced biodiversity in neighbourhoods.[29]

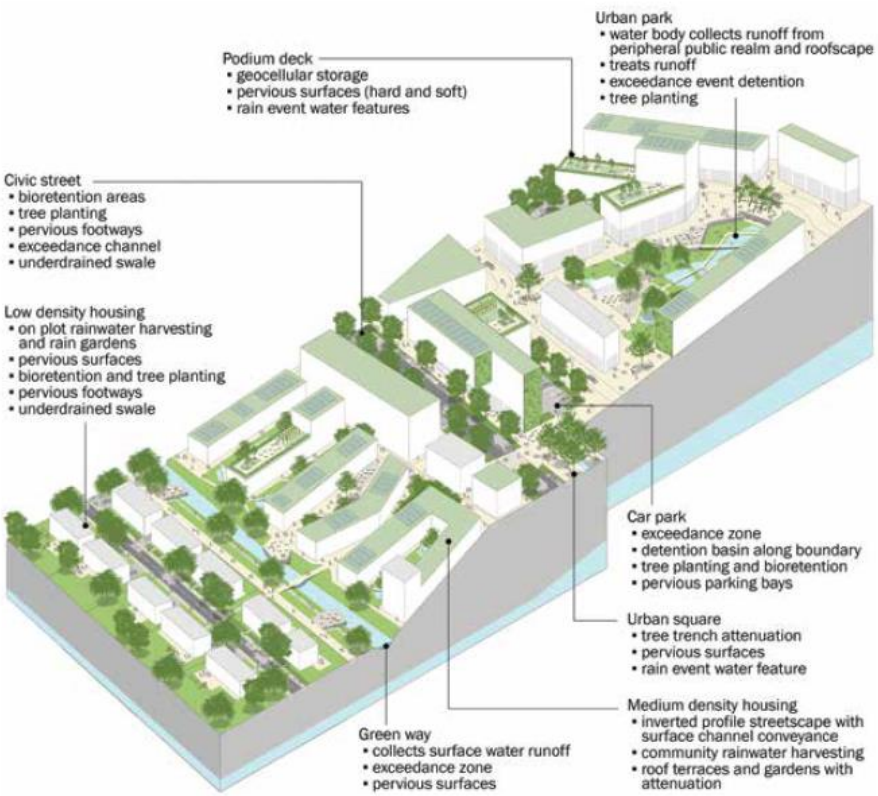
6.2.17. SuDS can be used within residential and non-residential development of all scales, even when spatially constrained (see examples of use in Figure 6.2). Early consultation is imperative for the most effective use of SuDS in development, engaging cross-topic specialists such as landscape architects, flood risk engineers, ecologists and spatial planners. The principles of SuDS design in development are within Table 6.2.

[29] CIRIA (2015). The SuDS Manual. London, England: CIRIA. Available at https://www.ciria.org/CIRIA/CIRIA/Item_Detail.aspx?iProductCode=C753 (Accessed August 2024)

Table 6.2 Principles of SuDS design[29]

Principles of SuDS design			
	Using surface water runoff as a resource		Promoting evapotranspiration
	Managing rainwater close to where it falls		Slowing and storing runoff to mimic natural runoff characteristics
	Managing runoff on the surface		Reducing contamination of runoff through pollution prevention and controlling the runoff at source
	Allowing rainwater to soak into the ground		Treating runoff to reduce the risk of urban contaminants causing environmental pollution.

Figure 6.2 Application of SuDS in different environments[29]



6.2.18. Non-residential development can demonstrate exemplary performance related to climate change adaptation through BREEAM by targeting the Pol 03 Flood and surface water management credits to minimise the risks of increased flood risk and surface water run-off affecting the site or other receptors in the catchment. This entails:

- Flood resilience: A site-specific Flood Risk Assessment (FRA) confirms that the development either remains within a location of low flood risk, even after taking into account future sources of flooding with climate change, or demonstrates that measures to increase the resilience to future flooding is incorporated into the final design of the building.
- Surface water run-off: Sustainable design of surface water management measures where all calculations must include an allowance for climate change, made in accordance with current PPG. Ease of maintenance must be integrated into SuDS design.

BREEAM Exemplary performance in climate change adaptation

✓ **Pol 03 Flood resilience** Designing to be resilient to future sources of flooding with climate change.

✓ **Pol 03 Surface water run-off** Drainage measures which improve peak rate and/or volume of run-off including climate change allowances.

WATER AVAILABILITY AND EFFICIENCY

6.2.19. In the coming century, there will be increasing pressure on water demand largely due to population growth and climate change effects on resource availability.[30] This has been reported in the UK CCRA3 as a risk to public water supplies due to reduced water availability (Risk I8) and the knock-on effect to the public of periods of water scarcity (Risk H10). To place this in a local context, the majority of the water supplied by Portsmouth Water comes from groundwater sources in the form of boreholes and wells[31]. Groundwater abstraction is highly dependent on rainfall.

UK CCRA Risk H10: Risk to household water supply.

Reduced summer precipitation will increase the likelihood of periods of water scarcity.

UK CCRA Risk I8: Risk to public water supplies from reduced water availability.

Simulating future water balances show a UK-wide supply-demand deficit.

6.2.20. Currently, it is estimated that average water consumption in homes in the UK is in the region of 142 l/p/d[32]. Even using technology and products that are available on the market today, water

[30] Lawson, R., et al. (2018). Ofwat: The long term potential for deep reductions in household water demand (Online). Available at: https://www.ofwat.gov.uk/wp-content/uploads/2018/05/The-long-term-potential-for-deep-reductions-in-household-water-demand-report-by-Artesia-Consulting.pdf

[31] Portsmouth Water (2019). Water Resources Management Plan.

[32] Energy Saving Trust (2013). At home with water. (Online). Available at: https://www.energysavingtrust.org.uk/sites/default/files/reports/AtHomewithWater%287%29.pdf

consumption can be reduced to 85 l/p/d by water efficient fittings, changing behaviours and the installation of rainwater harvesting.[33] Ofwat projections suggest it is possible to achieve 50 – 70 l/p/d within 50 years; other research within the UK domestic homes sector suggests water demand can be reduced to 49 l/p/d.33

6.2.21. Within non-residential buildings, BREEAM UK New Construction and BREEAM Refurbishment and fit-out guidance sets out exemplary performance targets with respect to water consumption (Wat 01). The minimum standard is to achieve 12.5% reduction in water consumption from the baseline; however, exemplary performance entails a minimum of 40% which equates to a minimum of three credits. This ensures water demand is minimised in periods of droughts.

BREEAM Exemplary performance in climate change adaptation

✓ **Wat 01** A minimum of 40% reduction in water consumption compared to a baseline building to ensure water demand is minimised in periods of droughts.

6.2.22. Rainwater harvesting (RWH) for potable and non-potable use can be applicable to single dwellings or to larger systems in commercial sites or community scale applications. RWH can be integrated with the design of surface water attenuation (as described in this section) such as SuDS and utilising green infrastructure such as reed beds to filter water, all linking to provide multiple benefits.

6.2.23. Greywater recycling (GWR) from appliances such as showers is considered to have low levels of contaminants, requiring low levels of treatment for non-potable purposes. Up to 75% of the water consumed in residential properties becomes greywater. Typically, the water is treated using membrane-based technology.[34] GWR produces a net benefit for medium to significant buildings systems; these increase in size for individual households/shops.

GREEN AND BLUE INFRASTRUCTURE

6.2.24. A national ecological emergency and the risk of the widespread loss of species, is highlighted in the UK CCRA3 (Risk N1). This is being addressed within development management through the introduction of Biodiversity Net Gain (BNG) as a mitigation driver. The Environment Act requires a mandatory BNG of 10% on development for which planning permission is granted under the Town and Country Planning Act 1990 (there are a few exemptions). Local Nature Recovery Strategies (LNRS) are also a flagship measure in the Environment Act. They are a new system of spatial strategies for nature which will

UK CCRA Risk N1: Risk to terrestrial species and habitats from changing conditions.

Potential for local and more widespread extinctions and losses.

[33] Makin, L. et al. (2021). WaterWise: A Review of Water Neutrality in the UK. (Online). Available at: https://database.waterwise.org.uk/wp-content/uploads/2021/10/A-Review-of-Water-Neutrality-in-the-UK-03.02.2021-1-1.pdf

[34] WaterWise (2020). Independent review of the costs and benefits of rainwater harvesting and grey water recycling options in the UK. Available at: https://www.susdrain.org/files/resources/evidence/Ricardo_Independent-review-of-costs-and-benefits-of-RWH-and-GWR-Final-Report.pdf

plan, map, and help drive more coordinated, practical, focussed action and investment in nature's recovery to build the national Nature Recovery Network.

6.2.25. The BNG legislation will enable a greater focus on the integration and extension of both GBI to promote biodiversity. This provides secondary benefits regarding climate mitigation actions in respect of both reducing urban heat island effects and offering additional shading benefits for buildings.

Figure 6.3 Key Term: Natural capital and ecosystems services[35]

Natural capital is the term for stocks of the elements of nature that have value to society, for example, forests, rivers, and biodiversity.

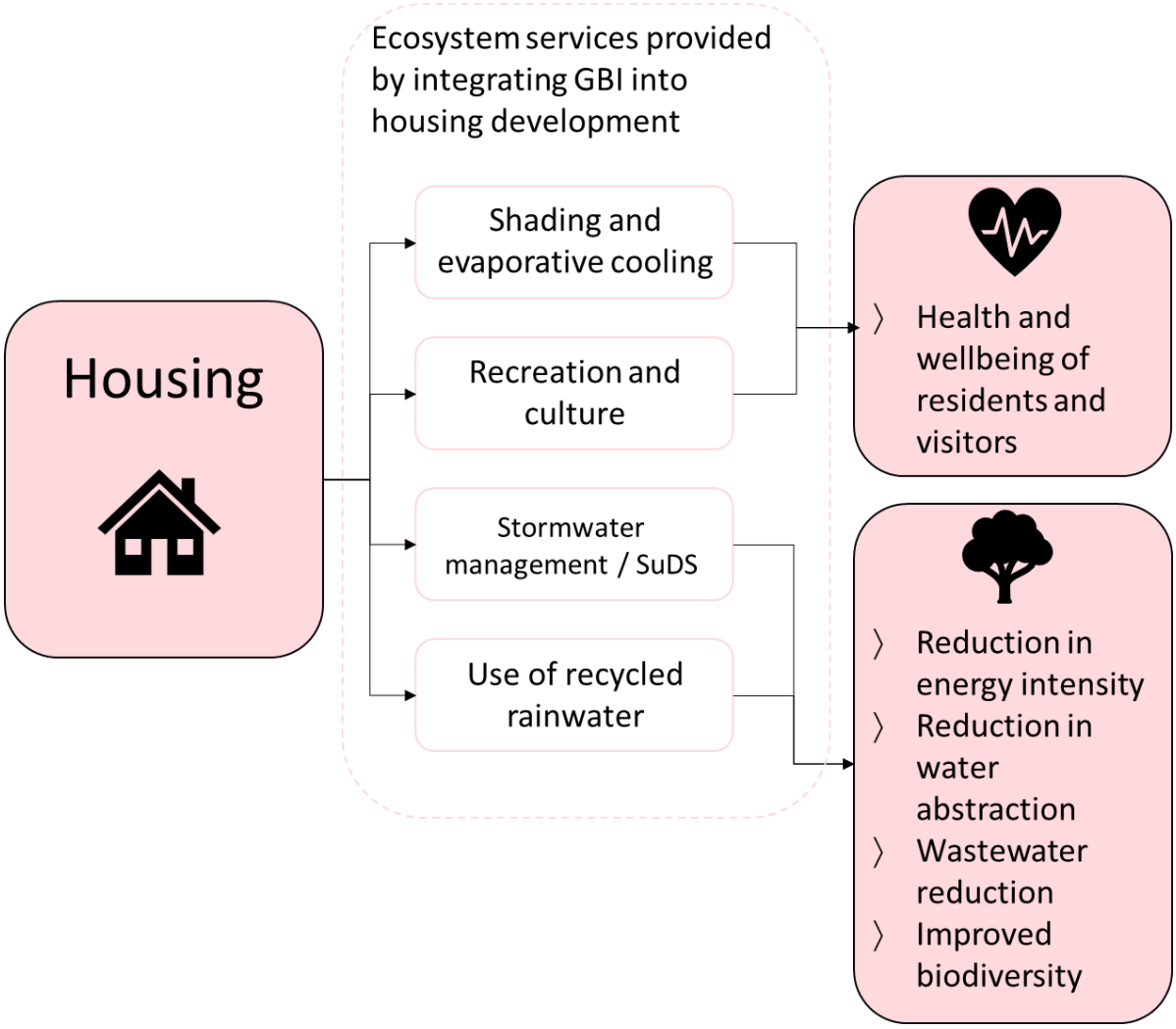
Stocks of natural capital provide flows of environmental or ecosystem services over time, these include:

- Provisioning services – outputs that can be obtained from ecosystems for human needs such as food, timber, water supply, crops
- Regulating services – ecological processes that regulate and reduce pollution such as carbon sequestration, water regulation.
- Cultural services – environmental settings that enable cultural interaction and activity such as recreation, education and tourism.
- Flows of natural capital – flows which aren't dependent on ecosystems such as minerals, solar, wind and tidal power.

A natural capital approach reframes nature positively as an asset that can support a range of social and economic outcomes, rather than simply as a constraint on or a victim of policy or development.

[35] Department for Environment, Food & Rural Affairs (2021). Enabling a Natural Capital Approach guidance. Available at: https://www.gov.uk/government/publications/enabling-a-natural-capital-approach-enca-guidance/enabling-a-natural-capital-approach-guidance#introduction-to-natural-capital

Figure 6.4 Systems mapping of the GBI role in the urban system resulting in socio-economic benefits, adapted[36]



6.2.26. Nature based solutions and green infrastructure should underpin climate change adaptation measures, while also being used within development design work addressing impacts such as overheating and flooding. Over time this will improve on the current situation, since an increase in habitat extent, condition and connectivity will improve the resilience of natural assets to climate change. This has a parallel benefit in enhancing the climate resilience of homes and businesses.

[36] Brown, K., and Mijic, Dr. A., (2019). Granthan Institute Briefing Paper No. 30: Integrating green and blue spaces into our cities: Making it happen. (Online). Available at: https://www.imperial.ac.uk/media/imperial-college/grantham-institute/public/publications/briefing-papers/Integrating-green-and-blue-spaces-into-our-cities---Making-it-happen-.pdf

7 SUSTAINABLE TRANSPORT

Commentary

The spatial layout of new and refurbished buildings can positively support active travel and access to public transport over private car use.

Building Regulation requirements now include provision for EV charging points within both residential and non-residential development.

Wider EV network development, within the public realm and places of work, can offer an important incentive for EV use and an alternative for households without sufficient parking areas and driveways to accommodate charging.

7.1 PRIORITISING WALKING, CYCLING AND PUBLIC TRANSPORT

7.1.1. A large percentage of carbon emissions come from transport habits of the occupants of new developments. Spatial planning shapes the pattern of future development, influencing the location, scale, density, design and mix of land uses. It can help reduce the need to travel and the length of journeys and make it safer and easier for people to access jobs, shopping, leisure facilities and services by public transport, walking and cycling. Providing more appealing walking, cycling (with secure cycle parking and changing facilities where appropriate) and public transport options is the best way to reduce car use. Sustainable and active transport has multiple benefits beyond saving energy and carbon: improved local air quality; health and wellbeing benefits from being more active; greater potential for social interactions; creation of green spaces and facilitating a car free life.

7.2 ELECTRIC VEHICLE CHARGING POINTS

7.2.1. In September 2023, the UK Government announced a revised timetable for its ban on the sale of all new petrol and diesel cars and vans. This means that all new cars and vans will be fully zero emissions at the tailpipe by 2035. EVs also bring further advantages in terms of reducing noise pollution and improving air quality.

7.2.2. New development provides the best opportunity to accelerate the scale of provision for EVs and should include charging provision for EV use as standard. The minimum requirements for the provision of EV charge points in accordance with the current Building Regulations Part S is summarised in Table 7.1. Note that non-residential requirements refer to both commercial and any other form of development outside of residential.

Table 7.1 Building Regulations – Part S EV Charging Summary

Development	Threshold	Minimum Requirement	Section[12]
Residential	All new dwellings with parking	A minimum of either at least one EV charge point for each associated parking space or the number of dwellings that the car park serves.	S1. (2)
	>10 parking spaces or more parking spaces than dwellings	Cable routes must be installed in any parking spaces which do not have EV charge points.	S1. (3)
Non-residential	>10 parking spaces	A minimum of one EV charge point, with cable routes for one in five of the total parking spaces.[37]	S4.

7.2.3. The Approved Document[38] provides the full technical guidance regarding the installation and charge point requirements in Part S to the Building Regulations. It applies to new residential and non-residential buildings; buildings undergoing a material change of use to dwellings; residential and non-residential buildings undergoing major renovation; and mixed-use buildings that are either new or undergoing major renovation.

7.2.4. The type of charging point will be decided on a case-by-case basis depending on the type and scale of development. All new EV charge points being installed will need to provide a minimum power supply of 7 kW or have the cable routes ready for this supply. It may be prudent to install cable routes that are capable of charging at a faster rate.

7.2.5. The design of parking facilities will affect the location and ease at which EV charging points can be installed. Charging points should be sited so that they are easy to access (including consideration for those with impaired mobility), in prominent locations that are well-signed for quick recognition by EV drivers. It is recommended that charging infrastructure provided at development adopts 'smart metering' enabling users to be charged for the energy they use.

7.2.6. In order to reduce clutter in parking areas the installation of charge points with two outputs could be considered, i.e. one charge post with an outlet on either side to serve two active parking spaces. EV charging points can be provided at low cost within dedicated off-street parking courts. Basement or under-croft parking provides particularly suitable environment for EV charging points. In these locations it is possible to provide secure charging points for vehicles where it would otherwise be impractical for private individuals to connect vehicles at home.

[37] Note that this is a single threshold for a given building, where parking is provided within the site boundary of the development. If, for example, a non-residential building has 20 parking spaces associated with it, then a minimum of one charge point is required. Cable routes for three spaces (one in five of 19 spaces) would also be required.

[38] Ministry of Housing, Communities & Local Government (2022). Infrastructure for charging electric vehicles: Approved Document S. Available at: https://www.gov.uk/government/publications/infrastructure-for-charging-electric-vehicles-approved-document-s

7.2.7. Management and maintenance of the charging infrastructure will be the responsibility of landowners and the chosen energy supplier. Those car parks privately managed should have appropriate enforcement procedures for the misuse of their parking stock.

8 DRAFT POLICY

8.1 PROPOSED WORDING

8.1.1. There are a number of key themes addressed in this document that are relevant to delivering net zero buildings within the Borough.

8.1.2. While not exhaustive, there are areas of initial policy development that can support delivery of these themes. Proposed policies are subject to Council agreement but are intended to set out a direction of travel in terms of what can be managed through the planning process.

8.1.3. In respect of projected energy use, the calculation of energy requirements includes both regulated and unregulated uses. Total energy consumption is therefore calculated as the sum of both regulated and unregulated energy demand (excluding use of EV charge points). Regulated energy use refers to fixed building services as regulated by Part L of Building Regulations (heating, cooling, domestic hot water, ventilation, fans, pumps and lighting). Unregulated energy use therefore refers to fixtures and appliances.

8.1.4. There are existing performance metrics that can be applied in order to evaluate the energy and water efficiency of any new development. The BREEAM scheme provides an overarching framework by which to formally measure the sustainability of any larger development. As noted in Section 5.3, this is not yet the case for materials and circularity. Measuring material reused, remanufactured or recycled as a percentage of the overall mass of materials required in any development is an initial metric that can be applied to all archetypes.

8.1.5. Sustainable Design – Residential

- Development proposals must demonstrate how they have implemented the principles and requirements set out here.
    - **The Energy Hierarchy** All proposals must embed the Energy Hierarchy within the design of buildings by prioritising fabric first, orientation and landscaping in order to minimise energy demand for heating, lighting and cooling.
    - **New Development** – Major development proposals will be required to achieve Net Zero Carbon and submit an ‘Energy Statement’ that demonstrates how the proposal will achieve:
        - Space heating demand less than 30 kWh/m^2/annum
        - Total energy consumption less than 40 kWh/m^2/annum
        - On-site renewable generation to match the total energy consumption; and
        - Net Zero Carbon in carbon emissions given the stated energy balance.
    - Where economic viability or technical constraints prevent policy compliance, proposals must first and foremost strive to meet the space heating and total energy consumption thresholds.
    - As a last resort, any residual energy is to be offset by a contribution to an Offset Fund, as far as economic viability allows.
    - **Minor developments** must demonstrate how the Energy Hierarchy has been applied in design. Achievement of net zero carbon in operation is encouraged,

recognising that there may be constraints to achieving this due to the quantum of development. Where economic viability or technical constraints prevent policy compliance, proposals must first and foremost strive to meet the space heating and total energy consumption thresholds.

- **Existing Buildings** Significant weight will be given to the benefits of development resulting in considerable improvements to the energy efficiency and reduction in carbon emissions in existing buildings. Proposals that promote best practice in energy efficiency and incorporate renewable energy generation are actively encouraged.

8.1.6. Sustainable Design – Non-residential

- **New Development** – Development proposals for major (a floor space of over 1,000 m^2) non-residential development must demonstrate how they achieve BREEAM 'Excellent' or an equivalent or better methodology.
- Development proposals for all non-residential premises must demonstrate use of the energy hierarchy and best practice guidance that delivers operational energy and carbon performance at least in line with current Building Regulation requirements.

8.1.7. Water Efficiency

- All dwellings (including conversions and change of use) must achieve an estimated water consumption of no more than 110 litres/person/day through the incorporation of water saving measures where feasible.
- Development proposals for 50 or more dwellings and non-residential development with a floor space of 1,000 m^2 or more must incorporate water reuse and recycling and rainwater harvesting measures.

8.1.8. Materials and Circularity

- All development proposals must minimise use of materials and creation of waste and promote opportunities for a circular economy through:
  - Wherever possible reusing or adapting existing buildings as part of the development, whilst maintaining and enhancing local character and distinctiveness
  - Reuse and recycling of appropriate materials that arise through demolition and refurbishment, including the reuse of non-contaminated excavated soil and hardcore within the site
  - Prioritise the use of locally sourced and/or sustainable materials and construction techniques that have smaller ecological and carbon footprints
- All development proposals are encouraged to identify materials available for reuse either as part of the design or via third parties in the initial design brief. This will enable tracking of circularity through the percent of total mass of materials, products and components/systems for the new build/refurbishment/fit-out that have been reused, repurposed or remanufactured.

8.1.9. Sustainable Drainage System Design

- Development proposals must prioritise the use of non-buried Sustainable Urban Drainage Systems (SuDS), including retrofit SuDS where feasible within existing town centres, commercial and retail areas.
- Designs must seek to:

- Reduce the overall level of flood risk on the site and the surrounding areas (accounting for impact of flows on existing drainage systems outside the development boundary)
- Incorporate SuDS within greenspace, blue and green infrastructure, amenity, and biodiversity schemes to manage surface water flows, improve water quality, educate and improve the wellbeing of communities
- Provide for simple and straightforward maintenance, including the provision of a plan and mechanism for on-going maintenance.

Appendix A

LEGISLATIVE REVIEW

INTERNATIONAL

The approach taken by the UK to addressing climate change has been shaped by a range of international agreements and climate change obligations including the Kyoto Protocol[39], the Paris Agreement[40] and the 2021 Glasgow Climate Compact[41] reflecting the UK's role as a signatory to the UNFCCC. The UK has set national mitigation targets in line with the globally recognised requirement to urgently limit GHG emissions to maintain global average temperature increase below 1.5 °C to 2°C.[40] This key international policy has strengthened the scaling up of action to improve the ability to adapt to adverse impacts of climate change.

NATIONAL

Legislation

The Climate Change Act 2008 amended in 2019[42], provides the basis for climate action in the UK. It commits the UK to a 100% reduction in GHG emissions by 2050, known as the net zero commitment. In line with the international treaty on climate change, the Paris Agreement, the UK committed to an interim target of a 68% reduction in economy wide GHG emissions by 2030, from 1990 levels.

The Climate Change Act 2008 also commits the UK to adapting to potential impacts of climate change, such as flooding, high temperatures and drought. The Act requires production of five-yearly climate change risk assessments (CCRA) detailing current and predicted impacts of climate change in the UK. The Third CCRA[43] was published in January 2022.

Planning legislation[44,45] establishes a duty on local planning authorities to mitigate and adapt to climate change. The Localism Act 2011[46] brought about radical reform of the planning system, which the Government considers key to securing progress on meeting the UK's climate change targets. At the local level, the Act introduced the NPPF[47] and a new presumption in favour of sustainable development. Other provisions in the Act enable community action on climate change through the development of NDPs and NDOs, and a 'duty to co-operate' is important for strategic planning of adaptation and mitigation issues with surrounding councils.

[39] UNFCC (1998). Kyoto Protocol. Available at: https://unfccc.int/resource/docs/convkp/kpeng.pdf

[40] UNFCC (2015). Paris Agreement. Available at: https://unfccc.int/sites/default/files/english_paris_agreement.pdf

[41] UNFCC (2021). Glasgow Climate Pact. Available at: https://unfccc.int/sites/default/files/resource/cop26_auv_2f_cover_decision.pdf

[42] The Climate Change Act 2008 (2050 Target Amendment) Order 2019 No. 1056. Available at: https://www.legislation.gov.uk/uksi/2019/1056/made

[43] Department for Environment, Food & Rural Affairs (2022). UK Climate Change Risk Assessment 2022. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1047003/climate-change-risk-assessment-2022.pdf

[44] Planning and Compulsory Purchase Act 2004 c. 5. Available at: https://www.legislation.gov.uk/ukpga/2004/5/contents

[45] Planning Act 2008 c. 29. Available at: https://www.legislation.gov.uk/ukpga/2008/29/contents

[46] Localism Act 2011 c. 20. Available at: https://www.legislation.gov.uk/ukpga/2011/20/contents/enacted

[47] Ministry of Housing, Communities & Local Government (2021). National Planning Policy Framework. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf

National Planning Policy

Revised in December 2023, the NPPF sets out the Government's planning policies for England and how these are expected to be applied. The NPPF is a material consideration in plan-making and development management decisions. The NPPF strongly reinforces the plan-led system as the primary mechanism to deliver sustainable development over the long term, allowing for proper engagement with communities. It highlights the key role of planning in helping to secure radical reductions in GHG emissions, minimising vulnerability and providing resilience to the impacts of climate change, and supporting the delivery of renewable and low carbon energy and associated infrastructure.

Paragraph 157 of the NPPF makes clear that climate change is a core planning principle:

> "*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*".

The NPPF sets out in paragraph 158 that Local 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 and changes to biodiversity and landscape, and the risk of overheating from rising temperatures".

Paragraph 159 states that: "New developments should be planned for in ways that:

- *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*".

Furthermore, it is stated in paragraph 162, that "local planning authorities should expect new development to:

- *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*
- *take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption".*

The supporting Environment Agency planning practice guidance, flood risk assessments: climate change allowances[48], contains the percentage uplifts for climate change to be added to assessments.

[48] Environment Agency (2016). Flood risk assessments: climate change allowances. Available at: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

Planning Practice Guidance

The Climate Change Planning Practice Guidance[49] (PPG) advises how to identify suitable mitigation and adaptation measures in the planning process to address the impacts of climate change. Addressing climate change is a core principle of spatial planning and planning also has an important role in delivery of new renewable and low carbon energy infrastructure to facilitate the transition to net zero. The Renewable and Low Carbon Energy PPG[50] provides further guidance on policies for renewable and low carbon energy.

The UK Net Zero Strategy

The UK Net Zero Strategy 2021 sets out a strategy for the UK to reach net zero by 2050. This strategy sets out sectoral policies and proposals for decarbonising all sectors of the UK economy to meet the coming carbon budgets, the Nationally Determined Contribution (NDC) and vision for a decarbonised economy in 2050.[51]

[49] Ministry of Housing, Communities & Local Government (2015). Climate Change. Available at: https://www.gov.uk/guidance/climate-change

[50] Ministry of Housing, Communities & Local Government (2015). Renewable and Low Carbon Energy. Available at: https://www.gov.uk/guidance/renewable-and-low-carbon-energy

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

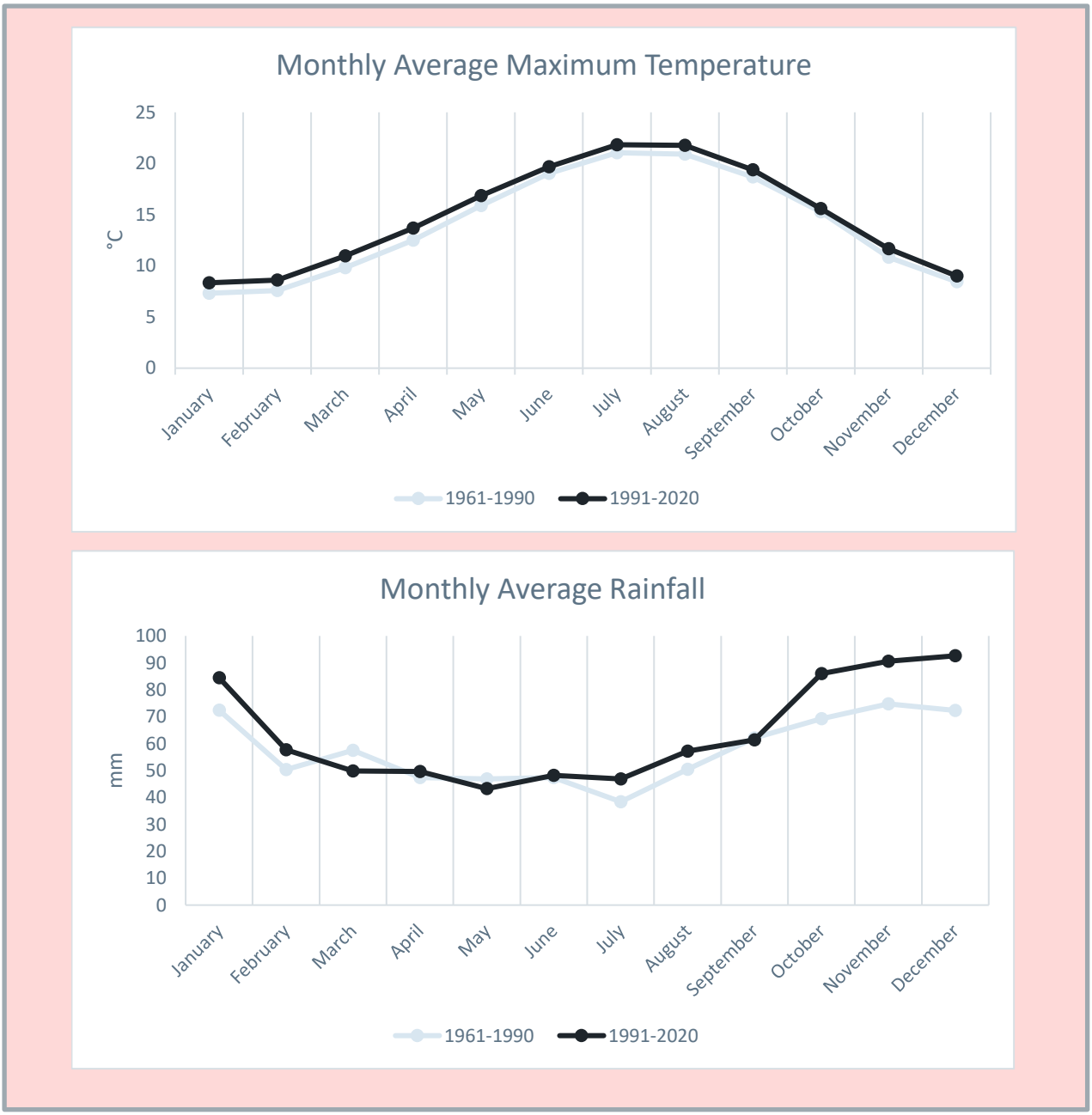
Appendix B

CHANGING CLIMATE

Havant's current climate is influenced by continental weather bringing cold spells in winter but hot, humid summers.[52] The South of England is also sheltered from weather associated with Atlantic depressions, making it a relatively dry region compared to the rest of the UK, with less seasonal influence. However, there is a trend towards peak rainfall being experienced in autumn / early winter. This is reflected within the meteorological data from climate stations operated by the Met Office; details from the Thorney Island Climate Station (located approximately 6 km from Havant Town Centre) are provided in **Box 8.1.** The data shows the steady increase in average maximum temperatures, alongside the accentuation of the peak rainfall associated winter, coupled with a trend towards drier summers.

[52] Met Office (2016). Regional Climate Summaries. Southern England: climate. (Online). Available at: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/regional-climates/southern-england_-climate---met-office.pdf

Box 8.1 Current climate – Thorney Island Climate Station[53]



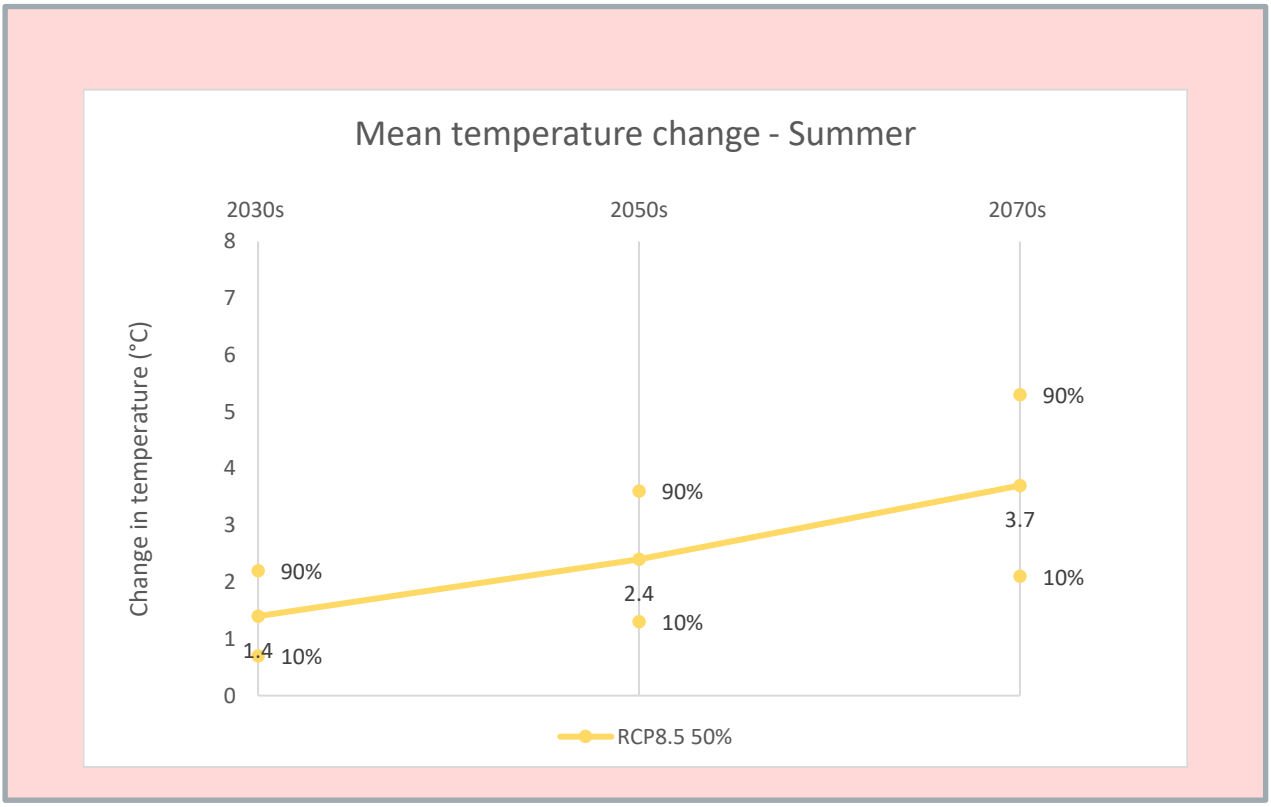
UK Climate Projection 2018 (UKCP18)[54] data provides a guide as to what future climate trends will likely need to be considered in development planning. UKCP18 produces data for a range of scenarios projecting future GHG emissions, known as representative concentration pathways

[53] Met Office (2022). Available at: https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gcp34fxfu.

[54] Met Office (2018). UK Climate Projections User Interface. Available at: https://ukclimateprojections-ui.metoffice.gov.uk/ui/home

(RCPs). Each pathway is derived from international projections published in the Intergovernmental Panel on Climate Change's 5th Assessment Report[55].

Box 8.2 UKCP18 Future climate – Summer temperature change



RCP8.5 is considered a high emissions pathway and represents a potential future which is slow to transfer to low-carbon energy provision. With progress towards achieving National Determined Contributions, RCP8.5 is considered a possible, but conservative, emission scenario.

For the RCP8.5, Havant is projected to experience up to a 5.3 °C increase in average summer temperatures by the 2070s (90th percentile or higher range projection), with the 50th percentile (mid-range projection) at 3.7 °C (see **Box 8.2**).

Portsmouth Water and Havant Water supply the fresh water to the Havant. The region operated by Portsmouth Water is designated as a region of serious water stress.[56] The Southeast of England is at the highest risk of potential for water scarcity.[57] The Borough is anticipated to experience a decrease in summer rainfall from the current baseline by up to -63% by 2070s under RCP8.5, with a 50th percentile (mid-range) projection of a 33% reduction (**Box 8.3**).

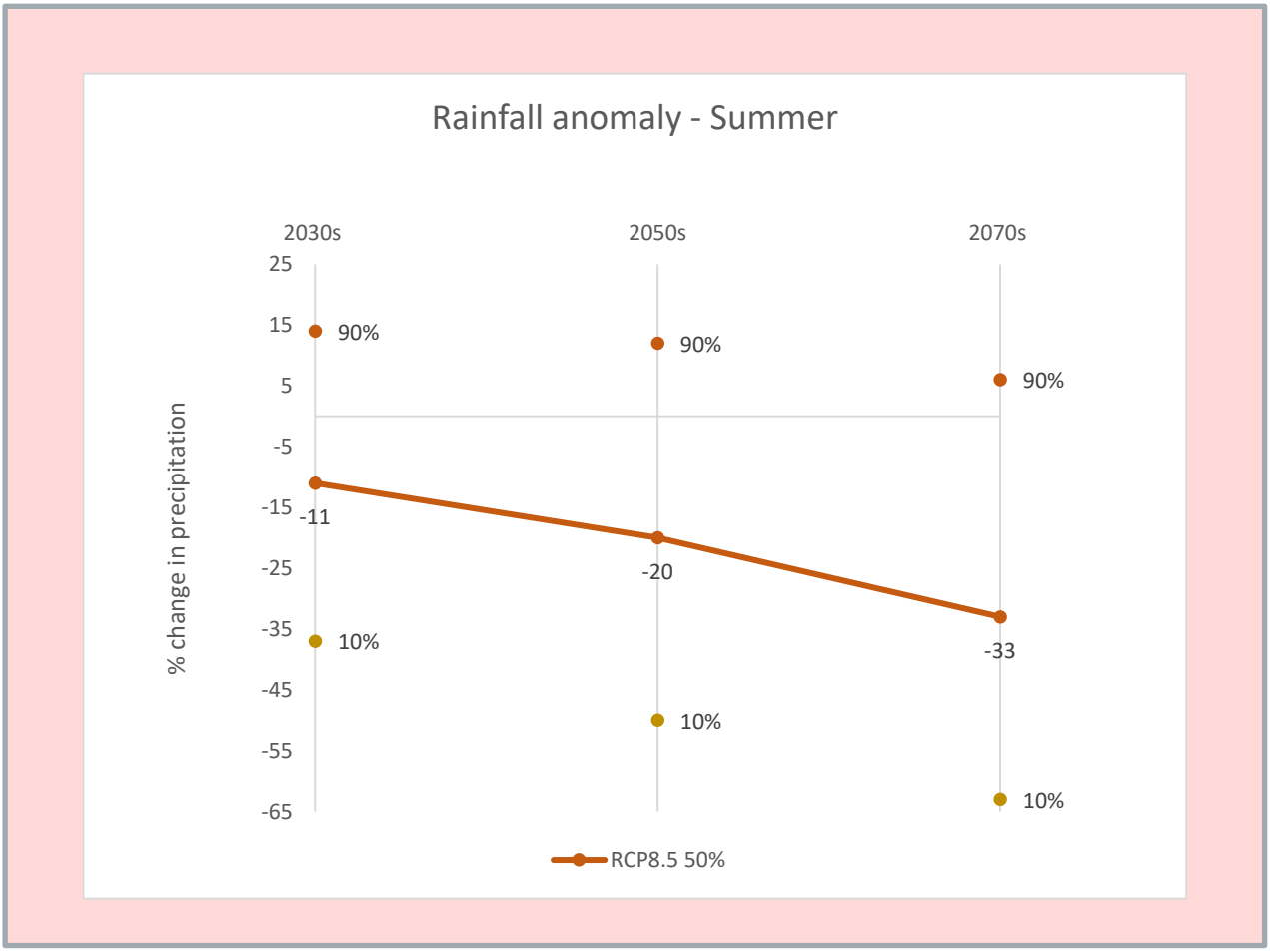
[55] IPCC (2014). Available at: https://www.ipcc.ch/assessment-report/ar5/ (Accessed December 2022)

[56] Portsmouth Water (2023). Revised Draft Water Resources Management Plan. (Online). Available at: Title Page (portsmouthwater.co.uk)

[57] Sustainability West Midlands (2021). Evidence for the third UK Climate Change Risk Assessment (CCRA3). Summary for England (Online). Available at: https://www.ukclimaterisk.org/wp-content/uploads/2021/06/CCRA-Evidence-Report-England-Summary-Final.pdf.

Despite a fall in projected average rainfall, the Southeast is also anticipated to experience a higher intensity of rainfall on the days when it does rain in the summer.[57] This increases the potential for summer flooding events due to extreme rainfall on existing hydrophobic soils.

Box 8.3 UKCP18 Future climate – Summer rainfall change

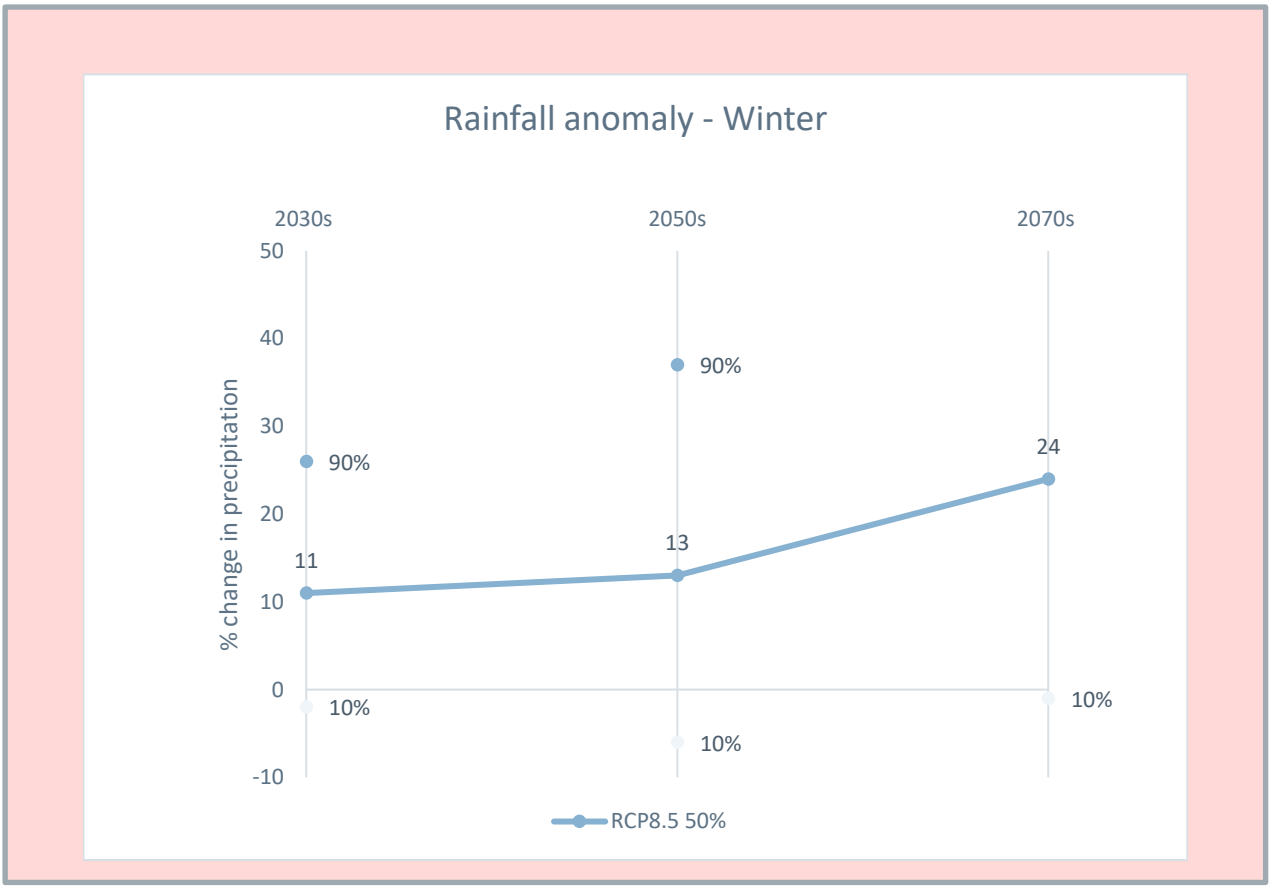


The Havant Borough Local Plan[58] has indicated higher risk of flooding associated with the Borough's 48 km of coastline. The Council are seeking to provide new coastal defences and flood risk and erosion management schemes in areas at risk of tidal flooding.

Any increase in average rainfall is likely to increase surface water flooding in the urbanised areas of the Borough, due to impermeable surfaces and the current capacity of the drainage network.[58] Future climate change predictions, for instance the increase in winter precipitation change shown in **Box 8.4**, suggest that surface water, sewer and groundwater flooding could become more frequent.

[58] Havant Borough Council (2019).Havant Local Plan (Online). Available at: download (havant.gov.uk)

Box 8.4 UKCP18 Future climate – Winter rainfall change



The interaction of the climate change trends requires consideration of a holistic approach to climate change adaptation within the built environment. This means that individual developments can't be built in isolation from their surrounding environment. Instead, design work relating to overheating and flood resilience needs to integrate and complement existing areas. This will improve the overall climate resilience of our communities.

A further important aspect of adaptation measures is the use of NBS.[59] These are defined as "*actions to protect, sustainably manage and restore natural and modified ecosystems in ways that address societal challenges effectively and adaptively, to provide both human well-being and biodiversity benefits*". In a local context, this means diversifying land use so as to integrate larger areas of natural vegetation ('green infrastructure') and water ('blue infrastructure') within our urban environment.

[59] International Union for Conservation of Nature and Natural Resources (2020). Global Standard for Nature-based Solutions (Online). Available at: https://portals.iucn.org/library/sites/library/files/documents/2020-020-En.pdf

Appendix C

POLICY MAPPING

SUMMARY OF RECOMMENDATIONS FROM POLICY MAPPING

The table below gives a high-level analysis of how material national policy is covered in Havant Borough Council's (HBC) environmental documentation, including the Climate Change and Environment Strategy (CCS). is spread across several different documents and is limited in detail. The Havant Borough Core Strategy (2011) contains information on climate targets and associated strategy within a suite of documents.

Areas of policy where enhancements could be addressed include:

Low carbon design

- Alignment of targets with Building Regulations and associated aspects of Part L, O and F which relate to energy efficiency in buildings.
- Demonstrable use of the energy hierarchy in Development proposals in seeking to deliver low carbon buildings.
- Signposting to HQM and BREEAM guidance as sources of good practice in implementing sustainable design

Green and Blue Infrastructure

- Demonstrable consideration of climate resilience in development proposals. More explicit detail requested in terms of regulated overheating assessment and related passive design measures
- Incorporation of nature-based solutions within major developments.
- Inclusion of consideration of SuDs and local green and blue infrastructure a part of Biodiversity Net Gain considerations and supporting infrastructure for climate resilience (including flood risk minimisation).

Materials and Waste

- Stronger view of waste management hierarchy in development proposals.
- Justification for demolition on brownfield sites and demonstration of maximising use of recovered materials on-site
- Encouragement to link re-purposing initiatives within the Borough
- Incorporation of recycling capacity within new developments.

Theme	Sub-theme	National Policy requirements	Havant Climate change and Environmental strategy (CCS)	Havant Borough Level policy	Conclusions as addressed by CC & Environmental Strategy	Recommendations
Low carbon design	Part L (Energy)	Part L building regs 2023 require new and existing buildings to deliver a higher standard of energy performance and a reduction in carbon emissions. The revised part L proposes that newly built dwellings should have 31% lower carbon emissions than under the old standard (superseded on 15th June 2023). new non-domestic builds need to produce at least 27% less carbon emissions. New homes will be measured under Standard Assessment Procedure (SAP10) which replaced SAP 2012. The Secretary of State considers that a dwelling has a very high performance rate for the purposes of the definition of a nearly zero-energy building if both of the following are met. a. The dwelling meets the target emission rate required under regulation 26. b. Both: i. An analysis is made of the technical, environmental and economic feasibility of using high efficiency alternative systems, which include decentralised energy supply systems based on energy from renewable sources. ii. This analysis is considered as required by regulation 25A See also NPPF p46 point 160 re increase the use and supply of renewable and low carbon energy and heat.	HA1i Reduce emissions from council buildings and vehicles to zero by or before 2050 by switching to renewable energy and EVs [but no mention of clean energy generation or energy hierarchy]. HA2i All new or reviewed contracts and procurement will embrace the net zero by or before 2050 target from 2021 HB1ii Promote retrofitting for existing homes to reduce energy demand and save money on heating. tackle fuel poverty and identify funding for schemes offering installation of energy efficiency measures, including insulation and smart thermostats. HB2ii Adopt approaches for delivery of new homes that meet or exceed energy standards. seek better protection for households through engagement with housebuilders, social landlords, and through effective, resourced enforcement. p.6 Acknowledgement of Clean Growth Strategy target to upgrade as many houses as possible to EPC Band C by 2035. No local target provided.	Core Strategy; Energy Hierarchy discussed (Green Lean Clean) 7.29 no mention of Renewable/LXC Technologies SPD 2011: 4.42-end of chapter discusses in detail the encouragement to use energy microgeneration techniques including solar panels. Havant Energy Study - Acknowledgement of BREEAM requirements but not commitment to them, just in terms of feasibility. BREEAM Excellent considered to be a suitable benchmark. Focussed instead on the Various 'clean' energy sources discussed (+CHP). Energy Strategy: Qualitative pointers towards energy efficiency measures in buildings. Work towards a 10% reduction of number of fuel poor homes in the borough. Use the adopted local plan to deliver energy efficient buildings for the future. Success = by 2020 Cosy Havant programme improved energy efficiency of borough's homes with over 300 energy saving measures installed (energy saving measures not included in plan).	The CCS provides quantitative targets in terms of providing net zero buildings, The Core Strategy provides more granularity in this regard, it outlines the Lean, Clean, Grean thinking. However, it needs updating to align with the approved documents and other national policy. The acknowledgement of BREEAM standards to meet these requirements demonstrates an aim to achieve this but detail in terms of whether this includes retrofit or just new buildings, and what the targets are is required. The 'Sustainable Energy opportunities in Havant report outlines a study of a variety of different renewable energy generation opportunities including wind, tide, solar and CHP (not renewable).	Strengthening of policy can look to address: - Understanding of the Energy Hierarchy - Reference to BREEAM - Fabric first approach (retrofit and new build) - Reference to Part L - Quantitative and qualitative targets relating to the above

	Part O (Overheating risk)	NPPF chapter 14 paragraph 158, following provisions.	Acknowledgement of increased number of heat waves but no targets relating to this for housing or otherwise within strategy.	SPD11: Concentrates on solar gain as a source of heat in the winter months. It does not allude to cooling aspects of housing design/planning to avoid overheating.	The SPD details the use of active and passive solar gain to improve heating efficiency of houses. This idea can be developed further by also looking at types of housing design, materials, methodologies (e.g. Passivhaus, BRE), as there is now more emphasis to limit solar gain (via Part O) to avoid overheating of homes.	Potential areas of policy to strengthen: Note Part O requirements and interplay with Part F (ventilation) can also be included. Targets relating to BREEAM - HEA 04 - Thermal comfort can be used for guidance here.
	BREEAM	No Mention of BREEAM in NPPF UK National Construction Strategy 2025 states that an environmental assessment should be carried out on all public projects with the aim of achieving an Excellent rating in BREEAM (or equivalent if an alternative system is used). This standard covers the requirements of the strategy which outline 33% lower costs, 50% faster delivery, 50% lower emissions, and a 50% improvement in exports (Construction 2025)	No mention of BREEAM or any building standards	Core Plan p74: Policy CS14 Development meets the following standards: - Residential development - Level 3 of the Code for Sustainable Homes - Multi occupation homes and non-residential development over 500sqm - BREEAM standard 'very good' - Improvements to these standards are encouraged, and particular attention to be paid to water efficiency measures The policy above is referenced and 'copied' into the SPD (2011)	The council has adopted BREEAM standards in policy CS14 of the Core Strategy (which is referred to in the CCS) to deliver more sustainable non-residential development and multi occupational homes across the borough over 500sqm. These buildings are required to comply with BREEAM 'Very Good' (or any future national equivalent). The CCS policy HB2ii encourages the delivery of new homes that exceed energy standards in new homes through stakeholder engagement.	Potential areas of policy to strengthen: Following BREEAM guidance is likely the best way to meet net zero goals in both construction and operation of non-domestic buildings.

	HQM (Home Quality Mark) (Replaces Code for Sustainable Homes) - BRE	No mention of HQM in NPPF - HQM is now a standard from BRE. Considered a voluntary replacement for the Code for Sustainable homes	No mention of HQM, Zero Carbon Homes target, Future Homes Standard	Code for Sustainable homes mentioned in the Core Strategy (See above)	Other than mentioning Code for Sustainable Homes in the Core Strategy, there is no more detail about this in the CCS. The CCS does not mention HQM or CSH or compliance specifically.	Potential areas of policy to strengthen: - Outline of HQM - How these will help the council meet the national target e.g. net zero borough by 2050.
Green and Blue Infrastructure	Part O (Overheating risk)	The aim of requirement O1 is to protect the health and welfare of occupants of the building by reducing the occurrence of high indoor temperatures. In the Secretary of State's view, requirement O1 is met by designing and constructing the building to achieve both of the following. a. Limiting unwanted solar gains in summer. b. Providing an adequate means of removing excess heat from the indoor environment. In the Secretary of State's view, compliance with requirement O1 can be demonstrated by using one of the following methods. a. The simplified method for limiting solar gains and providing a means of removing excess heat, as set out in Section 1. b. The dynamic thermal modelling method, as set out in Section 2	Acknowledgement of increased number of heat waves but no targets relating to this for housing or otherwise within strategy		No mention of nature-based solutions for cooling urban areas/buildings (old/new).	Potential areas of policy to strengthen: Biodiversity policy to include nature-based solutions for shade/cooling in urban environments / developments.

	Climate Resilience	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 temperatures. 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. (NPPF chapter 14)	7. (pg.7) Tackling Climate Change. Light definition of both mitigation and adaptation but not of resilience.	Core Strategy: p21 housing and infrastructure: mentions that within the full range of infrastructure required for housing will include flood defences CS15 sets out rigorous Flood and Coastal Erosion Risk Development risk checklist to ensure the protection of future developments from coastal flood risk.	No measures of mitigation, adaptation or resilience provided in the CCS.	Potential areas of policy to strengthen: While flooding and SuDs is well covered in the Core Strategy (CS15) There is no reference to overheating and the solutions that could be applied to adapt to this, e.g. through nature based solutions, thermal comfort
	Adaptation risk	NPPF 159: New development should be planned for in ways that 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.	As above	Policy CS15: "The council will work with partners to implement the Coastal Policy Zones in the North Solent Shoreline Management Plan to ensure that development avoids areas at risk from coastal erosion and coastal flooding and that areas required to offset coastal squeeze and prevent habitat fragmentation, to allow species to adapt to climate change, are identified and protected from development." Core Strategy: 7.35 ensures that new development is located away from areas at risk from flooding or coastal erosion.. the borough will respond to climate change by mitigation and adaptation. the Strategic Housing Land Availability Assessment and the Land Review have tested the options for avoiding flood and erosion risk ID in the Strategy flood risk assessment.	Significant research has been undertaken in terms of the flood/erosion risk (coastal) of Havant Borough. And as such HBC is aware of how this will affect new developments and has applied mitigation rules in relation to this.	Potential areas of policy to strengthen: -Explicit consideration of climate resilience in major development proposals

	Sustainable Urban Drainage	NPPF 173 and 175 requirements for sustainable drainage systems.	No mention of SuDS	Policy CS15 "All development will be required to ensure that there is no net increase in surface water run off. Priority should be given to incorporating SuDS to manage surface water drainage, unless it is proven that SuDS are not appropriate. Where SuDS are provided arrangements must be put in place for their whole life management and maintenance." The above is referenced and detailed upon in the SPD 2011 4.37	Mention of SuDs in the Core Strategy	Potential areas of policy to strengthen: -Explicit consideration of climate resilience in major development proposals
	General	NPPF - Environmental objective - to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity,… mitigating and adapting to climate change…" Exceptions are also made in the NPPF where development would cause harm to designated sites of importance for biodiversity. BNG is mandatory under Schedule 7A of the Town and Country Planning Act 1990 (as inserted by Schedule 14 of the Environment Act 2021) - Developers must deliver a BNG of 10%.	HC1 In line with Havant Borough Council's Biodiversity Strategy (Jan 2019), support and promote initiatives that halt biodiversity loss, conserve the biodiversity value of trees, support healthy, well-functioning ecosystems, and establish coherent ecological networks with more and better places for nature for the benefit of wildlife and people.	Core Strategy p. 67 acknowledges the development of biodiversity and conservation to be aligned with the significant amount of new development planned in the borough up to 2026. PUSH GI Strategy outlines the Green Infrastructure provision Policy CS13 Green Infrastructure 'Development proposals that adversely affect GI will not be permitted unless superior alternative provision can be provided or where local services will be improved.	HBC's Biodiversity Strategy supports a wider view on conservation and the proliferation of wildlife without mentioning BNG. However the PUSH GI Strategy does outline the Green Infrastructure provision with Policy CS13 putting in mitigation for the loss of biodiversity in replacement for development. This is in line with the NPPF.	Potential areas of policy to strengthen: -Explicit update in respect of Biodiversity Net Gain and potential link to wider climate resilience

Materials and Waste	Embodied Carbon	NPPF predominantly focuses on operational carbon, less embodied. However it points to a low carbon economy so assumptions could be made towards this.	HC3iv Collaborate with the Coastal Partnership on adaptation. Support proposals to minimise carbon emissions from implementation of the shoreline management plan. Hmi Align with Hampshire County Council methodology for reporting on carbon emissions. undertake a verifiable and objective reporting against the indicators listed in the Action Plan.	Core Strategy p. 17 Reduce CO_2 emissions and adapt to climate change. 7.28 of Core strategy: sustainable construction methods are a priority and references CS14 Efficient use of resources (under the requirements of BREEAM this could be covered) and CS16 High quality design. See also notes re CS14 above No actual mention of embodied carbon	The Strategy focuses on two main areas, 1) the administration of recording carbon emissions (but with no scope attached) and 2) minimising carbon emissions from the implementation of the shoreline management plan. This needs expansion and, in particular, for developments within the borough. Implementation could be covered by compliance to the BREEAM requirements, and planning proposals but this is not explicit. Resource management is noted in the Core Strategy in CS16 and CS14. However, there is no mention of embodied carbon per se, and this needs to be developed via the resource use and waste section.	Potential areas of policy to strengthen: -Explicit consideration of climate - For development make the link between materials used and the associated embodied carbon. - develop a target to reduce embodied carbon, through waste management techniques. - link to circular economy and provide qualitative or quantitative target relating to this.

	Water Efficiency	NPPF mentions water quality not efficiency. Part G: 125 litres/person/day of wholesome water (110 litres for optional requirement), and 5litres/person/day for outdoor use.	HC3iii Work with the EA, Southern Water and Portsmouth Water and other agencies to deliver schemes to improve provision of water supply, freshwater quality, coastal (seawater) quality, and mitigate nitrate pollution including addressing use of freshwater springs to protect aquifer function.	Core Strategy CS14 Efficiency use of resources: Particular attention to be paid to water efficiency measures in new developments (see also notes against BREEAM above)	The core strategy covers the main ethos towards water that the council have adopted. Although a target has been provided HC3iii, there is scope for this to be fleshed out in more detail and for specific national policy and solutions to be quoted and turned into targets.	Potential areas of policy to strengthen: - Use BREEAM requirements to guide robust strategy towards water quality and efficiency. - highlight risks to water supply and availability in the future and provide actions to combat this through new developments.

	Resource Use	NPPF Achieving sustainable development 8c) an environmental objective – to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy. NPPF 157 "...encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure." NPPF 216: Take account of contribution that substitute or secondary and recycled materials and minerals waste would make to the supply of materials before considering extraction of primary materials. Safeguarding mineral resources	point 5: How to make a difference 'use resources more efficiently: avoid waste, reuse and recycle.	Core strategy: p 21, point 6 of the Sustainable Community Strategy Caring for our borough - Growth must adapt to climate change and be located and constructed in a sustainable way, with regard to high quality design, energy, pollution, flood risk, waste and the consumption of natural resources Housing SPD CS16 High quality design point 2, 6) Mitigates negative environmental impacts through sustainable design and construction methods, resource efficiencies, particularly water and the provision of facilities for waste recycling.	While the CCS does mention the use of resources more efficiently and list elements of the waste hierarchy, the ambition to move to a more circular economy is to be encouraged. Equally the Core Strategy and Housing SPD champion recycling but this could be developed further into some targets The clean growth strategy and the industrial strategy both refer to the circular economy and a more resource efficient economy.	Potential areas of policy to strengthen: - Reduce number of resources used and waste procured Approved document H minimum requirements for solid waste storage BREEAM requirements for Very Good relating to Waste

	Waste	Waste & Resources strategy for England: pg46. Green Construction Board - guidance for increasing resource efficiency and reducing waste in the sector through the adoption of circular economy principles. Definition of zero avoidable waste.	References to waste in terms of definition and Havant's authority on waste	7.3 target aim to half waste to landfill, linked in with Code for Sustainable homes and BREEAM requirements, for planning applications.	Core strategy has included BREEAM requirements for waste. But nothing mentioned in the CCS on waste management in the borough and targets around this.	See above targets and include circular economy principles as laid out in Waste and Resources strategy for England.
Airtightness and overheating	Passive Design	National Construction strategy encourages improving our understanding of design approaches, including passive design, to balance energy demand and supply in the built environment - high performance, resource efficient buildings. Ambition of discipline of building engineering physics. considered to be crucial if the construction industry is to play its part in meeting the UK's ambitious emission reduction targets. p. 59 Construction 2025	HB2ii Adapt approaches for delivery of new homes that meet or exceed energy standards.	Core strategy CS16: designs should "6. mitigate negative environmental impacts through sustainable design and construction methods, resource efficiencies,…"	While not explicitly mention the Core Strategy commitment of CS16 and CS14 (including BREEAM) implies that passive design will be considered in developments.	Potential areas of policy to strengthen: -Examples of passive design & layout considerations: •Maximising the potential for passive solar gain when designing site layouts; •Design in measures to prevent excess solar gain in summer; and •Maximising the potential for passive cooling and ventilation in summer.

Appendix D

SUSTAINABILITY CHECKLIST

INFLUENCING GOOD PRACTICE

The way in which new homes and commercial buildings are being constructed is evolving to ensure an adequate contribution to overall net zero targets at national level.

There is a broader focus on the resilience of new buildings to a changing climate and how spatial considerations can support this in wider neighbourhoods. This means looking to broaden thinking in terms of the value of greenspace in supporting biodiversity as well as sustainable drainage requirements, accounting for offsetting in meeting truly net zero development and the way in which travel needs can be accounted for to promote active travel and sustainable neighbourhoods.

National ministerial statements, and the direction of national regulation, encourage Local Plans to promote a consistent approach with national policy, while recognising characteristics of local areas in their planning considerations. This does not prevent specific local targets, though these will be specific to local context (for example the scale of protected habitats and green belt areas) rather than seeking to drive standards beyond those in Building Regulations (for example in uplifting target CO_2e rates for new building)

In this context, Local Plan policies need to be supportive of good practice. This can be achieved through use of design checklists within planning applications that encourage applicants to evidence how relevant aspects of climate change mitigation and adaptation have been accounted for in their proposals. The intention of these checklists is to promote good practice thinking and enable planning applications to reflect on national priorities within local planning requirements.

SUSTAINABILITY CHECKLIST

A generic checklist can be used for both domestic and non-domestic developments. The scale of detail required can then be tailored for:

- Minor developments – Up to 9 dwellings or less than 1,000 m^2 of commercial space
- Major developments – 10 or more dwellings, or 1000 m^2 or more commercial floor space
- Redevelopment – change of use or extension of existing buildings

A proposed checklist is outlined here.

Table 8-1 – Sustainability Checklist

Reference	Policy Target	Evidence #1	Commentary
1	New Build Development (Residential)		
1.1	Space heating 30 kWh/m^2/yr	SAP or PHPP tool calculation	
1.2	Total energy use 40 kWh/m^2/yr	SAP or PHPP tool calculation	
1.3	On-site renewable energy generation = total energy use kWh/m^2/yr		
2	Non-residential Development		

2.1	Target Primary Energy Rate (TPER)	SBEM or other accredited software	
2.2	Target Emissions Rate (TER)	SBEM or other accredited software	
2.3	On-site renewable generation	SBEM or other accredited software	
2.4	Residual energy requirements	Net of (2.1 – 2.3)	
2.5	Residual carbon		
3	Sustainable Design		
3.1	Passive Design	Design statement regarding layout and associated site plan	Addressing overheating risk, building form, orientation and shading, including orientation of roofs to maximise solar energy potential
3.2	Overheating	Design statement and supporting calculations	Statement of how overheating risk has been reviewed; use of thermal mass, glazing/shading and passive ventilation to minimise heat gains. Calculations of resilience (CIBSE TM59 / CIBSE TM52 as relevant)
3.3	Fabric Efficiency	Design statement supporting fabric efficiency standard	Key U-values of building elements, airtightness targets, thermal bridging reduction. Post-occupancy evaluation (POE) if proposed.
3.4	Energy	Design statement regarding how energy needs will be met	Description of how energy needs will be met and use of renewables on-site. Includes mechanical ventilation where relevant.
3.5	Waste and circularity	Design statement regarding selection of materials and use of waste hierarchy.	Evidence of pre-demolition audits (brownfield sites) and how recovery of materials and re-use will be maximised. Evidence of consideration in selection of materials in terms of scale of recycling and future capacity to re-use/re-purpose.
4	Water		
4.1	Water efficiency	Design statement with target water use figure and evidence of measures to maximise efficiency	Demonstrate compliance with Part G requirements. Overview of efficiency measures and integration of recovery systems (e.g. rainwater harvesting or waste hot water recovery)

4.2	Surface water management	Design statement noting integration with existing flood management systems	Statement of how scheme has accounted for sustainable drainage and integration with local surface water management

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