

**Climate Change, Sustainable Design,
Construction and Energy Supplementary
Planning Document (SPD)
2024**



GUILDFORD
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1. Introduction

The purpose of this SPD

- 1.1 The purpose of this Supplementary Planning Document ('SPD') is to provide guidance for the planning policies contained in the Guildford Borough Local Plan: Strategy and Sites 2015-2034 (Adopted 2019) and the Guildford Borough Local Plan: Development Management Policies (Adopted 2023) (together they are referred to as the 'Local Plan') that deal with climate change and sustainable design, construction and energy.
- 1.2 It is intended principally for applicants for planning permission and their agents, and for planning decision makers. It has been produced to ensure that applicants provide the right information so that planning decision makers can assess whether development proposals comply with Local Plan policies.
- 1.3 This SPD is a material consideration in planning decisions. Decision makers will use it to help determine planning applications.
- 1.4 This SPD supersedes the Guildford Climate Change, Sustainable Design, Construction and Energy Supplementary Planning Document 2020. It updates the approach following the adoption of the Local Plan: Development Management Policies, changes to the National Planning Policy Framework (NPPF), changes to building regulations and consequent changes in construction practice.

The structure of this SPD

- 1.5 **Section 2** outlines the Local Plan policies that are relevant for climate change and sustainable design, construction and energy.
- 1.6 **Section 3** summarises the policy requirements and sets out the information that must be submitted by applicants to meet them.
- 1.7 **Section 4** sets out the information that must be included to meet the energy requirements.
- 1.8 **Section 5** sets out the information that must be included to meet the sustainability requirements.
- 1.9 **Section 6** provides guidance on applications for renewable and low carbon energy generation and storage developments.
- 1.10 **Appendix 1** contains a map of Heat Priority Areas.
- 1.11 **Appendix 2** contains a questionnaire that can be submitted by non-major development as an alternative to preparing sustainability and energy information.

2. Local Plan policy

- 2.1 Development Plan policies are the starting point for planning decisions. Planning applications are determined against the policies of the Development Plan and other material considerations. The Development Plan currently consists of:
- the [Local Plan: Strategy and Sites 2015-2034 \(2019\)](#),
 - the [Local Plan: Development Management Policies \(2023\)](#),
 - Local Plan 2003 policies that have not been superseded,
 - policy NRM6 of the South East Plan¹,
 - [Surrey County Council's waste and minerals plans](#), and
 - [neighbourhood plans](#) that have passed referendum.
- 2.2 This SPD provides guidance for three policies in the Local Plan: Strategy and Sites (LPSS) and five policies in the Local Plan: Development Management Policies (LPDMP):
- LPSS Policy D2: Climate change, sustainable design, construction and energy (as amended by LPDMP Policy D16)
 - LPSS Policy D1: Place shaping,
 - LPSS Policy P4: Flooding, Flood Risk and Groundwater Protection Zones
 - LPDMP Policy D5: Protection of Amenity and Provision of Amenity Space
 - LPDMP Policy D14: Sustainable and Low Impact Development
 - LPDMP Policy D15: Climate Change Adaptation
 - LPDMP Policy D16: Carbon Emissions from Buildings
 - LPDMP Policy D17: Renewable and Low Carbon Energy Generation and Storage
 - LPDMP Policy P11: Sustainable Surface Water Management
- 2.3 LPSS Policy D2 Criteria (5), (6), (7) and (9) have been superseded by LPDMP Policy D16 Criteria (1), (2), (3) and (4), respectively. This amendment extends the LPSS Policy D2 support for Combined (Cooling) Heating and Power (C)CHP heat networks to all low carbon heat networks. See page 16 for more detail.

¹ See Appendix 2 of the Guildford [Thames Basin Heath Special Protection Area Avoidance Strategy SPD](#)

3. Overview of the information required by decision makers

- 3.1 This section sets out the information that applicants must provide in order for planning decision makers to assess whether the requirements of the planning policies listed in section 2 have been met.

What information is required?

- 3.2 LPSS Policy D2 (3) requires the following documents or information to be submitted to support an application:
- (a) Applications for major development² must provide:
 - a sustainability statement, and
 - an energy statement.
 - (b) Applications for non-major development³ (including householder developments) must include:
 - sustainability information proportionate to the size of the development, and
 - adequate information to show how the energy and carbon requirements have been met.
- 3.3 Applications for the development of renewable and low carbon energy generation, and energy storage must include the information required by LPDMP Policy D17 in an appropriate document, for example within a Planning Statement and/or Design and Access Statement
- 3.4 The requirements for non-major development set out in (b) above can be satisfied through submission of a completed Climate Change, Energy and Sustainable Development questionnaire (contained in Appendix 2) and an energy modelling output document.

When should information be submitted?

- 3.5 For **full plans** applications, an energy statement and sustainability statement should be provided at the point of submission. The process of producing the information should inform emerging proposals and help to steer them towards sustainable outcomes, so it is necessary that the information is produced at an early stage, before the planning application is submitted.

² Paragraph 4.5.26 of the LPSS defines major development as residential development of 10 dwellings or more (gross) and non-residential development of 1,000 sqm gross new floorspace or more.

³ Non-major development is that below the threshold set out in Paragraph 4.5.26 of the LPSS. For clarity, this includes developments of one to nine residential units and one to 1000 square meters of non-residential floor space as well as householder developments.

- 3.6 For **outline planning** applications, the information submitted with the application should address any matters relevant to the outline plan. For example, if an outline plan includes a site layout, it should be accompanied by information setting out how the layout complies with the matters set out in policy and this SPD (e.g. how the layout is designed to reduce energy consumption, adapt to climate change, etc.). The level of detail within submitted information should be proportionate to the level of detail within the application.
- 3.7 For **reserved matters** planning applications, the information submitted with the application should address any matters relevant to the reserved matters application. For example, if an application includes details of the buildings that will be constructed, it should be accompanied by information showing how the construction will comply with the matters that relate to buildings (e.g. energy and carbon performance, water efficiency, construction and demolition waste management etc.).
- 3.8 The local validation list can be found here:
<https://www.guildford.gov.uk/validationlist>

What happens if information is not provided?

- 3.9 The information described in paragraph 3.2 is required in order for decision makers to assess whether the climate change and sustainable development requirements set out in planning policy have been met. If the required information is not provided at the right time, it is likely that decision makers will be unable to conclude that the proposal is compliant with planning policy. This may lead to unnecessary delays if further documents need to be requested or could result in planning permission being refused.

Alternative submission documents

- 3.10 Where accreditation is achieved in any of the following schemes, the energy and sustainability requirements of LPSS Policy D2 will be deemed to have been met. As a result, sustainability and energy statements (for major developments) and sustainability and energy information (for non-major developments) will not be required:
- for commercial schemes: BREEAM New Construction 'Outstanding' or 'Excellent'
 - for refurbishments: BREEAM refurbishment 'Outstanding' or 'Excellent'
- 3.11 Where the following accreditation is achieved, the energy requirements of LPSS Policy D2 (paragraphs 8, 10-11 only), LPDMP Policy D14 (paragraphs 1 and 4 only) and LPDMP Policy D16 (paragraphs 4 and 5 only), but not the other sustainability requirements identified in this SPD, will be considered met, and further energy information will not be required:
- for any new buildings: Passivhaus
 - for building retrofit schemes: Passivhaus EnerPhit
- 3.12 For the accreditation schemes mentioned above, the Council will need to see information that demonstrates that the accreditation can be achieved on the proposed scheme (e.g.

through the submission of a BREEAM New Construction Pre-Assessment Report), and will need to see proof that it has been achieved once the development has been completed (i.e. through submission of certification, e.g. a BRE issued New Construction Post Construction Certificate).

- 3.13 Other accreditation schemes may also be acceptable if the Council can verify the level of performance achieved by accredited buildings. The use of established sustainable construction systems (e.g. modular systems) may also be accepted where the Council can verify that the outcome will be a highly sustainable and energy efficient building.

Other matters

- 3.14 When granting planning permission, the Council will apply conditions requiring work to be carried out in accordance with the proposals and measures set out in the submitted energy and sustainability information.
- 3.15 Any documents submitted to support a planning application should have text that can be highlighted and copied throughout (i.e. the text should not be an image of a page, and the file should not be restricted or encrypted to prevent the copying of text). This is because decision makers may need to copy information from the document to check calculations, or to search the document for specific references.
- 3.16 For additional information, please visit the Council's climate change website using the link below.
- 3.17 Awaiting link.

4. Energy information

Energy information checklist

- Energy hierarchy compliance statement
- Low carbon heat network appraisal
- Low and zero carbon energy appraisal

- 4.1 Energy statements must be provided for **major development**. They must demonstrate that the approach to energy complies with the energy hierarchy, and that any energy measures proposed are appropriate and will be effective⁴. This section sets out the information that needs to be included.
- 4.2 **Non-major developments** do not need to submit an energy statement but are instead required to submit “adequate information” that shows the policy requirements have been met. This can be done through an energy statement or by completing the Climate Change, Energy and Sustainable Development questionnaire, see Appendix 2.

What do energy statements need to cover?

- 4.3 This section sets out guidance on energy, it is not intended to replace other industry guidance, and anyone preparing an energy statement should follow established best practice, where relevant. However, the energy statement must address the following matters in order to demonstrate that the proposals comply with Local Plan policy.
- 4.4 This SPD is a material consideration in planning decisions and the guidance will help decision makers to decide whether schemes comply with the energy requirements set out in Local Plan policy.

⁴ Paragraph 4.5.39 of the LPSS states that for energy technologies to be considered appropriate, they must be effective.

Energy hierarchy

Energy hierarchy compliance content summary

- Energy modelling output document(s) (e.g. SAP or SBEM) demonstrating that the carbon emission rate is lower than the TER for each individual building or group of identical buildings.
- Detailed information on how the proposed fabric is reasonably the best achievable standard in accordance with a fabric first approach. This information is not required for new dwellings if the energy modelling data shows that the DFEE is at least 10% better than the TFEE.
- Information setting out what heating/hot water system(s) will be used. If gas-based, this must include a justification as to why this has been selected over more efficient technologies.
- Details of any proposed on-site renewable energy.

- 4.5 The energy hierarchy (see the figure on page 108 of the LPSS) is a fundamental principle of sustainable development. It shows the sequence of steps that should be taken in order to reduce operational carbon emissions from new developments.
- 4.6 Energy demand should be eliminated in the first instance wherever possible through building design and the specification of components. Where energy demand cannot be eliminated, energy use should be reduced as much as possible through efficiency. After these steps, the remaining energy demand should be met from renewable and low carbon energy sources. This approach is often summarised as “**be lean, be clean, be green**”.
- 4.7 It is important to note; the hierarchy is a series steps, each less favourable than the last. Measures at each stage must be reasonably exhausted before moving onto the next stage. It is not adequate simply to include a measure at each stage.

Step 1 – Eliminate energy need through design and a fabric first approach

- 4.8 Developments should be designed to eliminate the need for energy. LPDMP Policy D14 (1) requires development proposals to demonstrate how they have followed a ‘fabric first’ approach in line with the energy hierarchy. This means that energy demand should be reduced by designing the building to make the best use of the surrounding environment. This includes passive design measures for instance, considering factors such solar gain when designing the layout of a development. Information on sustainable design can be found in [paragraphs 5.5-5.14](#) of Section 4. Energy demand should also be reduced by maximising the performance of the components and materials that make up the building fabric.

- 4.9 Information setting out how a fabric first approach has been followed should be contained within an energy statement or completed Questionnaire. Standard Assessment Procedure (SAP) (for dwellings), Simplified Building Energy Model (SBEM) (for non-domestic buildings) output documents or Building Regulations England Part L (BREL) compliance reports submitted to demonstrate compliance with LPDMP Policy D16 (4) can also show whether a fabric first approach has been followed.
- 4.10 SAP documents contain a Dwelling Fabric Energy Efficiency (DFEE) which is assessed against a Target Fabric Energy Efficiency (TFEE). DFEE and TFEE were introduced by the 2013 Building Regulations Part L. They set minimum fabric energy efficiency standards (the TFEE) and show how far above those minimum standards the building is designed to perform (the DFEE). The metrics measure the thermal bridging, air permeability and the rate at which materials used in each element of a dwelling allow heat to escape (quantified through u-values).
- 4.11 To comply with Building Regulations the DFEE must be equal to or lower than the TFEE. However, simply complying with building regulations minimum standards does not indicate a “fabric first” approach has been followed. There are examples within the borough of traditionally built new homes achieving a DFEE significantly lower than the TFEE, and innovative developments that achieve very low DFEE figures.
- 4.12 BREL (2021) sets worst case standards (limiting values) for the u-values for each individual building element taken in isolation. However, it is possible for a building to achieve the minimum standard for each element but still not comply with Building Regulations (i.e. not meet the TFEE) due to the properties of other components such as the thermal bridging and the air permeability.
- 4.13 Detailed information is required to demonstrate that the scheme complies with the energy hierarchy and fabric first by achieving the lowest DFEE that is reasonably achievable. This information could include:
- the different construction methods that were considered,
 - the different materials that were considered,
 - the different design solutions that were considered (e.g. different cavity widths),
 - a cost benefit analysis to demonstrate how the proposed approach is reasonably the best achievable standard.
- 4.14 However, where a dwelling will achieve a DFEE that is at least 10% lower than the TFEE, LPDMP Policy D14 (1) will be deemed to have been met and it will not be necessary to provide further justification to demonstrate that a fabric first approach has been applied.

Step 2 – Use energy efficient building systems

- 4.15 Once demand for energy has been minimised through a fabric first approach, developments should incorporate energy efficient systems, equipment, and applications to reduce the remaining energy demand.

- 4.16 Heat pumps have become by far the most common choice for heating and hot water in new buildings. They are significantly more efficient than gas-based systems, often delivering heat at a ratio to energy used that equates to an efficiency of around 400%. Consequently, heat pumps closely align with the energy hierarchy at step 2 while gas-based systems, with a maximum efficiency of around 90%, do not. Direct electric heating systems achieve an efficiency close to 100%. If heat pumps are proposed for heating and hot water, no further explanation as to how the energy hierarchy has been applied at step 2 is required.
- 4.17 Any development proposing to use a gas-fuelled system needs to explain and justify why this has been chosen instead of a more efficient low or zero carbon alternative, such as a heat pump or, failing that, a direct electric system. The fact that gas-fuelled systems are permissible under Building Regulations is not sufficient as justification because it does not explain how the energy hierarchy at step 2 has been applied as required by LPSS Policy D2 (2).
- 4.18 If it can be clearly shown that a gas-based system is the only option, then the system should be improved through the use of measures such as wastewater heat recovery to reduce gas consumption.
- 4.19 Where PV panels are proposed in order for gas-based system to meet building regulations requirements, the layout of panels should follow the guidance set out in the section [‘Low and zero carbon energy’](#).
- 4.20 New buildings are required to be adaptable for future energy systems under LPSS Policy D2 (4). Developments that are not proposing to use a heat pump must demonstrate that the building allows for one to be retrofitted at a later date, for instance by providing hot water or heat storage (e.g. a hot water cylinder or heat battery) and space for piping.

Step 3 – Supply energy from renewable and low carbon sources

- 4.21 In accordance with the energy hierarchy, the energy need that remains after the aforesaid steps should then be met using renewable and low carbon energy sources.
- 4.22 While heat pumps are now the default heating and hot water systems in new builds, it is still feasible to comply with Building Regulations using a gas-boiler supplemented with renewable energy. Where the case has been made for a gas-based system at stage 2 of the energy hierarchy, the renewable energy systems that are needed in order for the scheme to comply with Building Regulations emissions rates must be maximised in accordance with the hierarchy at stage 3. For example, PV panels should be placed on the elevation(s) that will achieve the greatest energy generation and must take the opportunity to maximise roof coverage, rather than propose the minimum needed to comply with Building Regulations.
- 4.23 LPSS Policy D2 allows for the use of low carbon energy technologies “in the locality of the development”, in line with the Planning and Energy Act 2008. This means that energy technologies do not necessarily need to be mounted on, or fall within the curtilage of, the new buildings. Low carbon energy located away from a building will count toward the reduction in carbon emissions of the building only where the low carbon energy is supplied

directly to the building e.g. through a decentralised energy network. If the energy is exported to the national grid, it will not count towards the reduction in carbon emissions of the new building, though the benefits of grid decarbonisation can be taken into account.

Step 4 – Offset carbon emissions

- 4.24 Once energy need is reduced as far as possible, and as much of the remaining energy need has been met through low and zero carbon energy, schemes seeking to deliver zero carbon development can offset any remaining carbon emissions through actions that either prevent an equivalent amount of carbon being released or remove an equivalent amount of carbon from the atmosphere.
- 4.25 Offsetting, which falls at the final stage of the energy hierarchy, is an option of last resort. If a development proposes offsetting, the credentials and measures will be considered on a case-by-case basis.

Zero carbon development

- 4.26 Proposals for zero carbon development are strongly supported under LPSS Policy D2. Zero carbon, for the purposes of the policy, means that emissions from all *regulated* energy use are eliminated or offset. Regulated energy refers to energy from building systems (e.g. heating, lighting, hot water) as opposed to unregulated emissions that refers to energy from other sources, like appliances. Fully zero carbon and carbon negative developments, that eliminate emissions from all regulated and unregulated sources, are also strongly supported. Other highly sustainable types of development such as ultra-low carbon and ultra-low impact are strongly encouraged and supported by LPSS Policy D2 and LPDMP Policies D14 and D16.
- 4.27 Where schemes have been designed to achieve zero carbon, the information submitted with the application should show the measures employed and the stages at which carbon reductions have been achieved (e.g. demand reduction, low and zero carbon energy and offsetting). This information must be consistent with the submitted energy calculations.

The performance gap

- 4.28 It is a known problem that the carbon and energy performance of buildings as-built falls short of the performance anticipated at the design stage. Studies have shown that this 'performance gap' can be extreme, with some new buildings emitting many times more carbon than expected from both regulated and unregulated sources⁵. Most new homes do not achieve the levels of energy efficiency predicted by their energy modelling assessments.
- 4.29 The Building Control system does not require new buildings to be tested against their design specifications after construction. The exception to this is airtightness, which is tested after construction and where buildings generally perform much better than Building Regulation

⁵ For example, studies undertaken by Innovate UK: <https://www.gov.uk/government/publications/low-carbon-buildings-best-practices-and-what-to-avoid> and <https://www.gov.uk/government/publications/low-carbon-homes-best-strategies-and-pitfalls>

standards. The Government may change the method for assessing the performance of new buildings through a change to Building Regulations.

- 4.30 The Council strongly supports the use of measures that would act to close the performance gap. Where such measures will be employed, the Energy Statement should provide details. Such information could include:
- detailed information setting out the site developer's robust internal processes and quality controls,
 - the implementation of a third-party process or system that focuses on ensuring that standards are met during construction, and
 - the use of a post construction testing regime for the proposed development and/or for previous developments undertaken by the same developer, with details of the outcome on previous developments.

Carbon emissions from buildings

- 4.31 LPDMP Policy D16 (4) requires all new buildings to achieve a carbon emission rate no higher than the relevant Target Emission Rate (TER) set out in BREL (2021). The emission rate must be achieved in a manner consistent with the energy hierarchy by prioritising demand reduction and efficiency measures before moving on to low carbon energy provision. The emission rate applies to each new building individually and not to the development as a whole.
- 4.32 Improvements to buildings standards will be necessary if the UK is to reach net zero carbon emissions by 2050. Consequently, LPDMP Policy D16 (5) strongly encourages development proposals to improve upon the standards in this policy, and this can be achieved by following the energy hierarchy.

Building regulations

- 4.33 The national mandatory standards for construction are set out in the building regulations. They cover all aspects of construction and set fabric efficiency rates as well as overall maximum carbon emissions rates for new buildings. The maximum carbon emissions rate for a building is referred to as the TER. The TER differs for different types buildings (e.g. flats, detached dwellings, offices) and is expressed in annual kilograms of carbon dioxide per square metre.
- 4.34 The emission rate of a proposed building is based on its design specification and is expressed as:
- Dwelling Emission Rate (DER) for self-contained dwellings and individual flats (excluding common areas). The DER is the annual carbon dioxide emissions of the proposed dwelling expressed in kilograms per square meter.

- Building Emission Rate (BER) for buildings other than dwellings. The BER is the annual carbon dioxide emissions of the proposed building expressed in kilograms per square metre.

- 4.35 Under the building regulations, the DER or BER for the proposed building must not exceed the TER.
- 4.36 The DER or BER of a proposed building is established through modelling. The approved national calculation methods used in the building control system are SAP for dwellings and the SBEM for commercial buildings. The models make assumptions about the carbon in different energy sources like grid electricity and mains gas, referred to as emission factors.

Emission factors

- 4.37 When undertaking modelling, applicants must use SAP 10 emission factors which came into effect with the adoption of Building Regulations (Part L) 2021 in June 2022. Data produced using Part L 2013 (e.g. SAP 2012) will not be accepted.
- 4.38 The key impact of the introduction of SAP 10 emission factors is a reduction in the carbon emission rate for grid electricity, which reflects the continuing decarbonisation of the national grid through the increasing use of renewable energy. The electricity emission factor has changed from 0.519 kg of CO₂ per kWh to 0.136 kg CO₂ per kWh. This is now lower than the emission factor for mains gas which is 0.210kg CO₂ per kWh⁶. As a result, electric technologies, such as heat pumps, perform far better on carbon emissions under SAP 10 than they did under SAP 2012 in the Building Control system.

Submission of emission rate

- 4.39 Larger residential schemes often use standard dwelling types across a site. Where this is the case, DER calculations will be necessary for each type of dwelling but not for each individual dwelling. However, care must be taken to ensure that the energy use and carbon emission data for a dwelling type is genuinely representative of all the buildings within that type.
- 4.40 There may be instances where there are variations within a dwelling type. In instances where buildings within a type would have a different carbon emission performance, it will be necessary to provide DER calculations for each individual unit or group of identical units so decision makers can be certain that each dwelling will achieve an emission rate no higher than the relevant TER.
- 4.41 In schemes where each dwelling is a bespoke design it is necessary to provide DER calculations for each individual dwelling.

Unregulated emissions

- 4.42 LPSS Policy D2 part (1e) requires schemes to include measures that enable sustainable lifestyles for building occupants, which could include measures that reduce unregulated

⁶ The SAP 2012 carbon emission factors for mains gas was 0.216kg CO₂ per kWh.

emissions⁷ e.g. through the installation of energy saving appliances, or design measures like drying areas that remove the need for tumble driers. A carbon reduction calculation may be included in the sustainability statement to demonstrate compliance with LPSS Policy D2 (1e).

Existing buildings

- 4.43 LPDMP Policy D14 (4) encourages developments proposals that will improve the energy efficiency of existing buildings to a level significantly better than the Council's adopted standards or national standards for new buildings, whichever is most challenging.

Low carbon heat distribution networks appraisal

Low carbon heat network appraisal content summary

- State if the development will fall within the vicinity of a Low Carbon Heat Network or Heat Priority Area.
- If within the vicinity of a Low Carbon Heat Network provide details of how the proposed development will connect to it (or be connection ready). Or provide clear justification as to why the development will not connect to the Low Carbon Heat Network.
- If in a Heat Priority Area or if the development is “large or intensive”, is a low carbon heat network proposed as the primary source of energy for the development? If not, set out clear justification as to why a Low Carbon Heat Network will not be delivered.
- If a Low Carbon Heat Network is proposed, is it designed in accordance with the CIBSE Heat Networks Code of Practice? Provide clear justification if not.

- 4.44 LPDMP Policy D16 states that the development of low and zero carbon and decentralised energy, including low carbon heat distribution networks, is strongly supported and encouraged. The policy also places requirements for developments to connect to low carbon heat networks where they exist and for developments within heat priority areas⁸ or that are “sufficiently large or intensive” to give low carbon heat networks adequate consideration as the primary source of energy.
- 4.45 Paragraphs (1), (2) and (3) of LPDMP Policy D16 supersede paragraphs (5), (6) and (7) of LPSS Policy D2 and extend the support for (C)CHP heat networks to all low carbon heat networks. The heat networks that result in the lowest carbon emissions will receive the strongest

⁷ Regulated emissions are those that result from building services (e.g. heating, cooling, hot water, pumps, lighting). Unregulated emissions are those from other sources (e.g. appliances, IT equipment, catering facilities).

⁸ Heat Priority Areas have been established through the Guildford Renewable Energy Mapping Study available at <https://www.guildford.gov.uk/article/22866/Guildford-Renewable-Energy-Mapping-Study>

support in line with this principle, whether driven by (C)CHP or other low or zero carbon technologies.

- 4.46 LPDMP Policies D16 (1-3) and LPSS Policy D2 (8) are in alignment with regulation 25A of the Building Regulations 2010 (updated in 2021 by Approved Document L) which requires applicants to analyse and take into account the feasibility of using high-efficiency alternative systems, such as low carbon heat networks.
- 4.47 In order to show that the requirements of LPDMP Policies D16 (1-3) and LPSS Policy D2 (8) have been met, the energy statement should include an appraisal of the feasibility of provision or connection to low carbon heat networks. The content of the appraisal depends on the characteristics of the development and/or where it is located, as set out below.

Developments within the vicinity of existing heat networks

- 4.48 LPDMP Policy D16 (2) requires all new developments to connect, or be connection ready, where a heat distribution network already exists.
- 4.49 The energy statement must set out the actions taken in order to investigate whether heat networks exist within the vicinity of the site and the results of the investigation. The investigation of opportunities should cover all scales and should not be limited to district heating systems.
- 4.50 Where such networks exist and developments propose to connect to them, the energy statement should set out details showing how connection will occur (a connection strategy).
- 4.51 Where such networks exist, and developments do not propose to connect to them, the energy statement must set out clear reasons as to why the connection is not feasible, or why an alternative source of energy would be more sustainable.
- 4.52 Where a development proposes not to connect to an existing network that is within the vicinity, it must still be connection-ready and the energy statement must set out how this is the case. Developments will be considered to be connection-ready if they use a centralised communal wet heating system and comply with the minimum requirements outlined in the Chartered Institute of Building Services Engineers (CIBSE) Heat Networks Code of Practice, and this should be reflected in the evidence provided in the energy statement.

Developments within heat priority areas and “sufficiently large or intensive developments”

- 4.53 LPDMP Policy D16 (3) requires developments within heat priority areas (see Appendix 1 for a map of the heat priority areas) and all “sufficiently large or intensive developments” ([see paragraph 4.60](#)) to give adequate consideration to heat distribution networks as the primary source of energy. The energy statement for such developments will therefore need to include an appraisal that either sets out that a heat network will provide the primary source of energy for the development or clear evidence that it is not feasible and/or that an alternative would be more sustainable.

- 4.54 Where a heat distribution network is not suitable for the whole of a site, it should be implemented on any part of the site that is suitable; for example, on the area with the highest density of buildings and/or in the vicinity of a source of heat or a baseload of heat demand. The appraisal therefore will need to assess the potential for heat networks on different parts of the site if it is not feasible for the whole of the site.

Scale and design of heat networks

- 4.55 LPSS Policy D2 (8) requires (C)CHP systems to be scaled and operated in order to maximise the potential for carbon reduction. This same principle should be applied to all heat networks. In order to meet this requirement, the energy statement should set out how a proposal for a network complies with the CIBSE Heat Networks Code of Practice.
- 4.56 In order to facilitate connection from other developments, new heat networks, including building level systems, should be designed to be able to expand to connect with future systems. The energy statement should set out how this will be facilitated.
- 4.57 Proposals for new heat networks should show that the chosen technology, or mix of technologies, will deliver the greatest carbon saving.

CHP/(C)CHP heat networks

- 4.58 CHP engines can be powered by a number of fuels, including natural gas. The change to emission rates ([see paragraph 4.37-4.38](#)) means that gas now compares much less favourably with electric technologies, and consequently the benefits of gas CHP in the assessment has reduced. This change should be considered when selecting a CHP technology alongside the continuing decarbonisation of grid electricity.
- 4.59 Zero carbon fuels and electricity should be favoured, taking into account potential impacts on air quality. Where gas engines are proposed, the distribution network should be designed to facilitate the replacement of the gas engine with a low or zero-carbon alternative once the gas engine reaches the end of its life⁹. Where biomass engines are proposed, the Council will take into account the short to medium term impact on carbon emissions that results from burning wood ([see paragraphs 4.74-4.75](#)).

Significant sources of heat

- 4.60 The definition of “sufficiently large or intensive developments” includes residential developments of 50 dwellings or more that are either located near a significant source of heat or would include two or more non-residential uses that would generate a significant amount of heat or heat demand¹⁰.
- 4.61 Significant sources of heat include buildings and land uses that produce waste heat in a quantity large enough to be captured for use in a heat network. This can include industrial buildings, incinerators and large infrastructure facilities. Some environmental features

⁹ Zero carbon fuels for CHP include biomass, biomethane and, in the longer term, hydrogen.

¹⁰ See paragraph 4.5.35 on page 109 of the LPSS for more information.

should also be considered significant sources of heat, such rivers and lakes, the heat from which can be captured using water source heat pumps.

Low and zero carbon energy appraisal

Low and zero carbon energy appraisal content summary

- Information about the feasibility and benefits of all reasonable options.
- Justification setting out how the chosen option(s) would result in the most sustainable outcome, i.e. the lowest carbon emissions.

- 4.62 As set out on page 12, LPSS Policy D2 (2) requires applicants to follow the energy hierarchy except where it can be demonstrated that greater sustainability can be achieved by utilising measures further down the hierarchy. Steps 2 and 3 require energy efficient building systems and energy supplied for renewable and low carbon sources. Paragraph 5.240 of LPDMP Policy D16 states appropriate technologies are those that would be effective, the energy information should demonstrate that the most effective technology or mix of technologies has been selected.
- 4.63 There are a number of low and zero carbon energy technologies available that can supply electricity and/or heat to residential and commercial buildings. These include (but are not limited to):
- ground, air and water source heat pumps,
 - solar photovoltaic (electricity),
 - solar thermal (heat),
 - small scale wind turbines,
 - standalone wind turbines,
 - biomass power and heat,
 - small scale hydro power,
 - geothermal energy,
 - high temperature thermal storage (e.g., sand batteries),
 - micro CHP, and
 - Combined Heat and Power (CHP) systems.
- 4.64 In order to be sure that proposed energy technologies will be effective, decision makers will need to be sure that the building occupants will use them to meet all or most of their energy needs. As a result, technologies that may be used sporadically (including fireplaces and log burners) will not be accepted as low carbon energy technologies for the purposes of Local Plan policy. This is not the case for biomass heating technologies, which are usually primary sources of heat and/or power for the building in which they are installed ([see paragraphs 4.74-4.75](#)).

- 4.65 The appraisal should consider all reasonable options for renewable and low carbon energy, assessing the feasibility and benefits of each in turn. Decision makers will need this information in order to confirm that the most effective and appropriate energy technology has been selected. The appraisal should reflect current costs and up-to-date technology specifications alongside local factors. In particular, where the Energy Statement assesses the carbon saving potential of energy technologies, it should use real-world performance and take into account the future decarbonisation of the national grid, rather than relying on the emission factors used in the Building Control system which are updated infrequently.

Solar and photovoltaic panels

- 4.66 Solar and photovoltaic (PV) panels should be sited where they will be most effective and therefore achieve the greatest carbon payback. If sited on north facing or heavily shaded roofs, the payback is likely to be limited or possibly non-existent. As a result, poorly sited solar/PV panels would not accord with LPDMP Policy D16 (4) which clarifies that “technologies will be considered appropriate only where they would be effective”.
- 4.67 Paragraph 5.206 of LPDMP Policy D16 notes applicants should consider the embodied energy technologies, for example, solar/PV panels have embodied carbon emissions from their construction and transportation. Consequently, ineffective solar/PV panels that do not yield operational carbon benefits and would not achieve a payback, are not sustainable and are contrary to LPDMP Policy D14 (2b).
- 4.68 Where schemes employ solar/PV panels, the opportunities for decarbonisation should be maximised in accordance with the energy hierarchy at step 3.

Heat pumps

- 4.69 Since the change to Building Regulations England Part L (BREL) in 2022, heat pumps have become the standard heating technology used in new buildings, including dwellings. The government envisages that heat pumps (alongside heat distribution networks) will be the principal means of providing heat for buildings once the new “Future Homes” standard is fully implemented¹¹. When appraising heat pump technologies, at least two heat sources (from air, water and ground) should be considered and a separate appraisal of each presented.
- 4.70 Appraisals of heat pumps should take account of the high efficiencies (expressed as the Coefficient of Performance, or COP) at which heat pumps provide useful heat when calculating the carbon emissions they would produce when running on grid electricity.
- 4.71 The carbon emission factors were updated by BREL (2021) from the previous BREL (2013) values. The emission factor of grid electricity is now lower than the emission factor for mains gas ([see paragraph 4.37-4.38](#)).

¹¹ See the government’s Future Homes consultation at <https://www.gov.uk/government/consultations/the-future-homes-and-buildings-standards-2023-consultation>

- 4.72 It is important to note that the emission factor of grid electricity will continue to decrease as the national electricity grid further decarbonises which means the carbon emissions associated with heat pumps will continue to fall. In addition to the energy input being lower for heat pumps than gas boilers, domestic heat pumps are typically over three times more efficient than gas boilers (e.g. often achieving a COP of around 4 or greater, which can be thought of as 400 per cent efficiency, when the heating system is designed correctly), so the projected amount of carbon per unit of heat produced will be lower than with a domestic gas boiler (which typically have a maximum efficiency of around 90 per cent).
- 4.73 Heat pumps work best when producing heat at a lower temperature than traditional boilers. BREL (2021) set a maximum flow temperature for residential units so all new dwellinghouses can accommodate heating systems based on heat pumps. Heat pumps generally perform better with underfloor heating systems, but if radiators are used, they should be larger than with traditional gas-fed or electric systems to increase the total area of heat emitting surfaces.

Biomass

- 4.74 Energy and heating systems that are powered by biomass (such as wood chips, wood pellets and organically derived fuels like biomethane) are usually considered to be zero carbon in operation over the long term. This is because while burning the biomass (or digesting it in the case of biomethane) releases carbon dioxide, this carbon dioxide was originally extracted from the atmosphere when the energy crop grew, and will be removed again when the crop is replaced, adding no new carbon to the carbon cycle.
- 4.75 However, biomass sourced from forestry results in a negative impact on the climate in the short and medium term because burning wood releases a large amount of carbon quickly but growing trees to a size at which they can be harvested can take several decades. As a result, burning wood at scale will result in a sharp spike in atmospheric carbon that will take decades to be mitigated. This is not the case for quick-growing energy crops; for example, any carbon released when burning annual crops like straw will be removed from the atmosphere within a year as the next crop grows. Additionally, wood chips and wood pellets are often sourced abroad and imported over long distances resulting in large transport emissions. Where wood fuelled energy systems are proposed, the energy statement should take into account both the impact of burning on atmospheric carbon levels in the short to medium term and the potential embodied carbon emissions that result from harvesting, extraction, processing and transporting of the fuel.

Wind turbines

- 4.76 The borough is within the 30km wind turbine consultation zone for Gatwick Airport. Where free standing wind turbines greater than domestic scale are proposed, the Council will consult with the aerodrome operator and/or the operator of technical sites (e.g. radar

stations) regarding the safety of air traffic. The Council will also review standing advice from, and consult with, the Ministry of Defence and NATS (National Air Traffic Control).

DRAFT

5. Sustainability information

Sustainability information checklist

- Sustainable design statement
- Natural resources statement
- Climate change adaptation statement

- 5.1 LPSS Policies D2, P1, D4 and LPDMP Policies D14-16, P11 set a number of requirements covering sustainable design and construction matters. This section provides guidance on those matters and sets out the information that **major developments** should submit so that decision makers can assess whether the schemes comply with Local Plan policy. This section does not cover compliance with the carbon emission and low and zero carbon energy requirements of LPDMP Policies D16 (1-5) and LPSS D2 (8, 10-11) for major developments as compliance with these requirements is established through an energy statement - see section 4.
- 5.2 **Non-major developments** do not need to submit a sustainability statement, but can instead submit sustainability information that is proportionate to the size of the development. This requirement can be met by submitting a Sustainability Statement or a completed Climate Change, Energy and Sustainable Development questionnaire (see Appendix 2). The guidance provided in this section should still guide non-major development proposals and applicants should refer to it when drafting sustainability information or completing the questionnaire.

What do sustainability statements need to cover?

- 5.3 This section sets out guidance on sustainable design and construction and climate change adaptation, but it is not intended to be exhaustive or to replace the large amount of guidance that is available elsewhere. However, the sustainability statement must address the matters in the following table in order to demonstrate that the proposals comply with Local Plan policy.

Policy	Sustainable design
LPSS Policy D2 (1c)	Reduction of energy demand in line with the energy hierarchy and the 'fabric first' approach, including through landform, layout, orientation, massing and landscaping, with regard to the efficient use of natural resources and to maximise the use of the environment for passive heating and cooling.
LPSS Policy D1 (2)	Performing positively against Building for a Healthy Life guidance.

LPSS Policy D2 (1e)	Incorporation of measures that enable sustainable lifestyles for building occupants.
LPSS Policy D2 (1d)	Compliance with the highest national standards of water efficiency, which for residential developments of one or more gross units currently means achieving a water efficiency standard of a maximum of 110 litres per occupant per day.
Policy	Natural resources
LPSS Policy D2 (1a)	Efficient use of mineral resources and incorporation of a proportion of recycled and/or secondary aggregates.
LPSS Policy D2 (1b) and LPDMP Policy D14 (5)	Minimisation of waste and reuse of excavation and demolition waste, demonstrated through a Site Waste Management Plan where applicable.
LPDMP Policy D14 (2)	Minimisation of embodied carbon emissions by sourcing materials locally and taking into account the embodied carbon emissions of materials.
Policy	Climate change adaptation
LPSS Policy D2 (4) and LPDMP Policy D15 (2-5)	Adaptation that provides resilience and reduces vulnerability to a changing climate and changing weather patterns and the full range of expected impacts, including the urban heat island effect, overheating, severe rainfall events, and wildfires.
LPDMP Policy D15 (1a)	Development will be designed and constructed to provide for the comfort, health and wellbeing of occupiers over the lifetime of the development.
LPDMP Policy D15 (1b)	Incorporation passive heat control measures, in line with the cooling hierarchy.
LPSS Policy P4 (5)	Prioritisation of SuDS to manage surface water drainage.

- 5.4 This SPD is a material consideration in planning decisions and the guidance will help decision makers to decide whether schemes comply with the sustainability requirements set out in Local Plan policy.

Sustainable design

Sustainable design content summary

- Information on how the site layout, landscaping and urban form have been considered.
- Details of how the internal layout and orientation of buildings have been designed to make the best use of solar gain and natural light.
- Evidence that the proposal has had regard to Building for a Healthy Life guidance.
- Details of the proposed measures to enable sustainable lifestyles.
- Information setting out the measures that will be employed to efficiently use water.
- Water efficiency calculator for new dwellings worksheet demonstrating that the new dwellings will achieve a maximum water usage no greater than the highest national standard.

Landform, layout, building orientation, massing and landscaping

- 5.5 To satisfy LPSS Policy D2 (1c) and paragraph 162a of the NPPF, information should be provided setting out how landform, layout, building orientation, massing and landscaping have been considered to reduce energy consumption. Key sources of energy consumption in development are heating and artificial lighting.

Site layout, landscaping and urban form

- 5.6 Applicants should set out the factors that been considered when designing buildings to reduce energy consumption. Passive solar gain refers to the process whereby a building is heated by the sun, either directly from sunlight passing through a window and heating the inside of the building, or indirectly as sunlight warms the external fabric of the building and the heat travels to the interior. Passive solar gain can reduce the need for mechanical heating, which in turn reduces energy use and carbon emissions.
- 5.7 Solar gain should be optimised, so consideration should be given to the type and location of buildings to prevent excessive shadowing that would result in little solar gain on external surfaces. Well positioned buildings will create spaces that maximise heat receipts, this includes consideration of the slope or topography of a site. While considering sustainable design applicants must ensure there is not an unacceptable impact on the living environment of existing residential properties or unacceptable living conditions for new residential properties, in accordance with LPDMP Policy D5 (1)
- 5.8 A compact urban form is generally more energy efficient as there is less opportunity for heat to escape. However, this needs to be balanced with the need to avoid the Urban Heat

Island effect and overheating ([see paragraphs 5.103-5.113](#)). The prevailing wind should also be a consideration in site design as exposure to cold winds will increase heat loss and energy use. Conversely in the summer, gentle breezes can be used to reducing energy use on mechanical cooling systems by enhancing natural ventilation.

- 5.9 If deciduous trees are proposed applicants should set out if they will provide shading during the summer months and allow more natural light and heat to be received during the winter months. However, while foliage can provide some reduction in solar gains it should not be taken into account when considering whether Building Regulations Part O: Overheating (2021) has been met.¹²
- 5.10 Planting can be used to create a more favourable microclimate and help to manage flood risk. Planting must be in accordance with LPDMP Policy P7 (5-7). Applicants should have regards to native species that support local wildlife and are tolerant to extreme climate conditions such as drought and waterlogged soils. Databases are available online to help select the most appropriate species for a site such as Appendix 1 of the Value of Trees report¹³, which contains a species selection matrix.

Building orientation and building layout

- 5.11 Whilst passive solar gain can reduce the carbon emissions associated with heating, if used incorrectly it can lead to overheating. All new residential buildings must comply with the requirements of Building Regulations Part O: Overheating which took effect in June 2022 ([see paragraphs 5.103-5.106 for local requirements](#)).
- 5.12 Developments should not incorporate mechanical cooling unless it has been demonstrated that passive measures have been fully explored and appraised, and would be inadequate ([see paragraphs 5.107-5.108](#)).
- 5.13 Development proposals should set out factors that have been considered in the design of buildings, such as but not limited to, the location of rooms with heating appliances (e.g. kitchens) and the location of the rooms that are occupied the most/least frequently.
- 5.14 Natural lighting reduces the energy used for artificial lighting and creates a healthier internal environment. To show how LPSS Policy D2 (1c) has been followed applicants should set out how they have considered how much of the sky is visible through a window (the more, the better), the dimensions of the interior living/working space and distance from the window, and the proportion of glazed surfaces.
- 5.15 Glare created by natural or artificial light can be uncomfortable for people both inside and outside a building. This can be minimised if considered early in the design process through building layout (e.g. low eaves height) or building design (e.g. blinds, brise soleil screening).

¹² As stated at paragraph 2.9 of Building Regulations Overheating: Approved Document O. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1057374/ADO.pdf

¹³ The Value of Trees report. Available at: <https://www.adeptnet.org.uk/documents/value-trees-report>

Building for a healthy life

- 5.16 Building for a Healthy Life (BHL) sets out design guidance for new housing developments and includes criteria that relate to environmental and social sustainability, as well as promoting design that generally creates good places. Paragraph 138¹⁴ of the NPPF encourages local planning authorities to make appropriate use of assessment frameworks such as BHL, with the use of BHL is also backed by the NHS and Homes England.
- 5.17 BHL uses twelve considerations to help structure discussions between local communities, the local planning authority, the developer of a proposed scheme and other stakeholders. Schemes that are considered to have achieved at least nine 'greens' (based on an independent BHL assessment of the development proposal by Design South East) will receive BHL Commendation.
- 5.18 LPSS Policy D1 (2) expects new development to perform positively against the recommendations in BHL guidance. What this means in practice is that each of the recommendations should be followed, unless there are genuine reasons for not doing so, which should be explained in the submitted sustainability information.
- 5.19 Applications should include a checklist against the questions set out in the latest BHL guidance, as required by LPSS Policy D1 (2). The Council will engage positively with developers to assist them in receiving BHL Commendation.
- 5.20 The BHL guidance can be found here: <https://www.designforhomes.org/project/building-for-life/#:~:text=Building%20for%20a%20Healthy%20Life%20is%20an%20initiative,adopted%20by%20many%20local%20authorities%20for%20planning%20approval>.

Measures that enable sustainable lifestyles for building occupants

- 5.21 In accordance with LPSS Policy D2 (1e), applicants should set out measures that will be incorporated included in developments that enable the occupants of the new buildings to live lifestyles that are more sustainable. The following measures should not be considered exhaustive.

Sustainable transport

- 5.22 New developments must maximise the use of the sustainable transport modes (walking, cycling and public and shared transport) in line with LPDMP Policy ID3.
- 5.23 Providing and incentivising alternatives to private motorised transport can reduce the number of vehicles per head of population, reduce the amount of land needed for parking and reduce the embodied emissions caused by the manufacture of private vehicles.

¹⁴ NPPF paragraph 138, available at: [National Planning Policy Framework \(publishing.service.gov.uk\)](https://www.gov.uk/government/publications/national-planning-policy-framework)

Walking and cycling

- 5.24 The Local Cycling and Walking Infrastructure Plan identifies Core Walking Zones. These must be considered as a constituent part of relevant planning applications.
- 5.25 The routes and infrastructure which comprise LPDMP Policy ID9: Achieving a Comprehensive Guildford Borough Cycle Network are the starting point for the identification of improvements primarily for utility¹⁵ cycling.
- 5.26 Taking into account the aims of Surrey County Council's (SCC's) Rights of Way Improvement Plan, enhancement of local public rights of way should be explored with SCC.

Cycle parking standards

- 5.27 Cycle parking must be included in new developments. LPDMP Policy ID10: Parking Standards for New Development and the Parking Standards for New Development SPD (2023) contain cycle parking standards for a variety of uses.

Public and shared transport

- 5.28 Developments can contribute to the requirement to enable sustainable lifestyles by providing or enabling models of shared transport, such as car clubs and a bike share scheme. Please refer to SCC's Car Club Guidance. SCC will also be able to advise how a proposal for bike share would integrate with any existing bike share schemes.
- 5.29 The more rural areas of the borough present an opportunity for greater provision of Demand Responsive Transport. This is expected to reduce the need for car ownership without restricting residents' ability to travel. Applicants should liaise with SCC, as the Transport Authority, on the potential to introduce or expand Demand Responsive Transport services to occupiers of the site.

Mobility hubs

- 5.30 Shared transport can be incorporated into a 'mobility hub' which co-locates public and shared modes. LPDMP Policy D7 sets out how mobility hubs can contribute to high quality public realm whilst promoting transport sustainability for local residents and businesses.

Vehicle trips

- 5.31 Car parking standards are set out in LPDMP Policy ID10 and the Parking Standards for New Development SPD. Parking standards are also set out in adopted Neighbourhood Plans, these take precedence over standards set by the Local Planning Authority, except in relation to strategic sites. Low-car and car-free development is encouraged in appropriate locations, working as a part of a comprehensive multimodal transport strategy. Further information is set out in LPDMP Policy ID10 (4a and b).
- 5.32 Provision of electric vehicle (EV) charging points in new developments brings benefits in terms of air quality and carbon reductions through decarbonisation of electricity generation

¹⁵ Utility cycling refers to cycling done simply as a means of transport rather than as a sport of leisure activity.

infrastructure. EVs also provide energy storage that, when used alongside other measures, such as smart meters, can deliver smart energy networks.

- 5.33 Provision of vehicle charging points is expected for specific types of development as set out in Building Regulations Part S.

Last mile logistics

- 5.34 Logistics, in this case the transporting of goods, can impact both commercial and residential development. Positive interventions include the use of cargo bikes, EV vans and residential parcel consolidation facilities.

Travel planning measures

- 5.35 Developments could also complement physical infrastructure and services with appropriate incentivisation. Measures such as vouchers for free or discounted membership of car clubs, bike share schemes and use of local bus services could be provided. Information packs provided to residents or occupiers should be regularly monitored and updated.

Energy demand reduction

- 5.36 Where dwellings or commercial units are sold or leased fully fitted/furnished, low energy appliances should be provided in order to reduce the energy used by building occupants and enable sustainable lifestyles in accordance with LPSS Policy D2 (1e). Buildings can also be designed to remove the need for appliances. For example, by providing space to dry clothes naturally, the need for a dryer is removed. Applicants can include an energy calculation showing the consequent reduction in unregulated carbon emissions to quantify the improvement. However, this is separate to the regulated emissions that are assessed by BREL.
- 5.37 Whole Home solutions are favoured by the Council. Approximately 15-50% of self-generated energy will be used by a dwelling, depending on how well a dwelling's consumption is matched to ebbs and flows of generation. Opportunities for solar self-consumption should be maximised. This includes, but is not limited to, installing smart heating, domestic batteries, solar hot water diverters and solar electric vehicle charging. This ensures self-generated energy is most efficiently used at the source before being exported to the grid. Whole Home solutions facilitate sustainable lifestyles in line with LPSS Policy D2 (1e), applicants should clearly set out where they are proposed.

Recycling storage

- 5.38 At present in Guildford borough, all recycling material is usually collected in one bin and is sorted after collection. Regulatory changes are proposed by the Government but there have been several changes to the proposed new national standards¹⁶. Consequently,

¹⁶ Section 45A of the Environmental Protection Act 1990 was amended by the Environment Act 2021 and now requires recyclable household waste in each recyclable waste stream to be collected separately, subject to exceptions. Available at: [Environmental Protection Act 1990 \(legislation.gov.uk\)](https://www.legislation.gov.uk/ukpga/1990/61/section/45A).

adequate space should be provided for recycling storage to allow for recyclable materials to be separated, as is already commonplace elsewhere in the country.

- 5.39 Development proposals are required to demonstrate external servicing features and stores are integrated into the build form and do not detract from the overall design of the scheme to comply with LPDMP Policy D6 (1). This includes storage areas for recycling purposes which enable sustainable lifestyles in line with LPSS Policy D2 (1e). In order to future proof developments, recycling storage space should be adequate to allow the occupants of buildings to separate their recyclable waste, taking into account the size of recycling material containers, the frequency of collection and an allowance for seasonal variation. For commercial developments, space should be allowed for the collection and storage of bulk material for recycling. The proposed refuse and recycling storage points should be identified when detailed plans are submitted.

Community food growing

- 5.40 LPDMP Policy ID6 (6) states new residential development proposals are expected to consider provision of community growing space in addition to other types of open space. Community food growing spaces are supported by the Council as they help achieve sustainable development in the following ways:
- locally grown food reduces food miles, lowering embodied carbon and contributing to improved air quality,
 - vegetated open spaces reduce the urban heat island effect,
 - the permeable surfaces of food growing spaces and the harvesting of rainwater contribute to sustainable drainage, and
 - rooftop gardens provide accessible open space in high-density developments.

- 5.41 The guidance document “Good planning for good food - using planning policy for local and sustainable food” (2011), prepared by Sustain, explores how local authorities and communities can use planning policy and decisions to create more local and sustainable food systems. The report is available at:
https://www.sustainweb.org/publications/good_planning_for_good_food

Public drinking water fountains

- 5.42 7.7 billion plastic bottles are bought across the UK each year, resulting in substantial amounts of single-use plastic waste. Refilling bottles saves resources used to produce bottles and also CO₂ emissions from transporting bottles of water. Water fountains also provide a healthier alternative to sugary drinks. Sugary drinks are a major contributor to excess sugar in our diets which can lead to avoidable diet-related disease.
- 5.43 Public drinking water fountains and refill stations can enable sustainable lifestyles by providing free access to potable water thereby reducing the number of single-use plastic water bottles. The Council encourages major developments in areas with high public footfall such as in Guildford town centre, the district and local centres, and applications that

provide open space, to provide public drinking water and specify details in the sustainability statement.

Water efficiency

- 5.44 LPSS Policy D2 (1d) requires water efficiency in new development to meet the highest national standard. The “highest national standard” refers to the standard that has the lowest water consumption. For residential development, this is defined in the supporting text as the ‘optional Building Regulation’ for water efficiency in new dwellings¹⁷, which is currently 110 litres per person per day, or a tighter standard if one becomes available nationally. If a new, more stringent national standard is introduced, this will be adopted automatically by virtue of LPSS Policy D2 (1d).
- 5.45 There are presently no other national standards for non-residential developments than those in the Building Regulations. However, the principle of water efficiency in line with the waste hierarchy applies to all developments. As a result, all developments should seek to reduce demand through efficiency measures, and then meet remaining demand from sustainable sources wherever possible.
- 5.46 For all developments, the submitted information should set out an approach to water management that reduces water usage and wastage, and prioritises demand reduction measures over supply measures.
- 5.47 Development, whether new construction or change of use and refurbishment, can save water by including measures such as:
- tapered and low-capacity baths,
 - using appropriate flow rates for low energy buildings¹⁸, and
 - water efficient white goods and appliances such as washing machines and dishwashers.
- 5.48 For all new dwellings, a condition will be applied requiring a completed “water efficiency calculator for new dwellings” worksheet that accords with Part G of the building regulations’ Approved Documents to be submitted prior to occupation. The calculation must demonstrate that the new dwellings will achieve a maximum water usage of 110 litres per person per day.
- 5.49 LPDMP Policy D14 (6) expects new developments to incorporate measures that harvest and conserve water resources and, where possible, water recycling/reuse systems. Applicants should provide details of any proposed water recycling/reuse systems.

Rainwater harvesting

- 5.50 Rainwater harvesting is the collection of rainwater directly from the surface it falls on (e.g. a roof). A typical three-bedroom semi-detached house in the southeast of England receives approximately 6,000 litres of rainfall per annum. Once collected and stored this rainfall can

¹⁷ The standard is set out in regulation 36(b) of the Building Regulations 2010 (as amended)

¹⁸ As set out in the AECB water standards guidance, available at: <https://aecb.net/aecb-water-standard/>

be used for non-potable purposes such as watering gardens, thereby reducing consumption of potable water. In a residential development, rainwater can be captured for domestic use using water butts connected to a down pipe. Larger systems can use water stored in underground water tanks.

Greywater re-use

- 5.51 Water that is recycled from bathrooms and kitchens for non-potable uses is known as greywater. Greywater systems usually require treatment on a regular basis to prevent a build-up of bacteria, and some systems are powered, which entails an energy cost. As a result, greywater reuse is generally less preferable than water use minimisation measures. However, the substantial water savings it provides mean that is a highly sustainable action.

Natural resources

Natural resources content summary

- Details of the embodied carbon emissions of materials, with reference to a respected materials rating database (e.g. BRE Green Guide) or scoring system (e.g. SCORS).
- Explanation of how recycled and/or secondary aggregates will be used.
- Details about using materials that are composed of recycled or reclaimed material.
- Information setting out how locally and sustainability sourced materials will be used.
- A Site Waste Management Plan for major developments, and development proposals that involve the demolition of at least one building and/or engineering works that involve the importation or excavation of hard core, soils, sand and other materials.
- For applications involving demolition followed by replacement, information setting out why demolition is necessary and the specification and methods that will be employed to mitigate the sustainability impact.

Resources, materials and waste

- 5.52 The issues of efficiency in the use of mineral resources, waste minimisation and reuse of buildings and materials are closely linked. New developments should apply the principles of the waste hierarchy and seek to eliminate waste as the first step, reuse waste as the second step, send waste materials for recycling/reclamation as a third step and ensure waste is sent for energy recovery or safe disposal as a last resort, depending on the material.

Materials

Embodied energy and carbon

- 5.53 Embodied energy and embodied carbon are key considerations in sustainable development. Embodied energy is the cumulative energy needed to grow / extract, manufacture and transport materials to a development site and embodied carbon refers to the cumulative carbon emissions produced from that energy.
- 5.54 Building materials typically account for around 60-70% of the embodied carbon in a development. Therefore, it is essential to consider the carbon impact of building materials at the start of the design process. LPDMP Policy D14 (2) requires development proposals to demonstrate that embodied carbon emissions have been minimised by sourcing materials locally (where possible) and take into account the embodied carbon emissions of materials, based on information in a respected materials rating database provided by a reputable organisation with relevant expertise. Respected materials ratings databases include, but are not limited to:
- The Building Research Establishment's (BRE) Green Guide to Specification and accompanying online database¹⁹ of materials. The BRE provides the Green Guide Calculator which sets a methodology for calculating the impact of materials not yet rated.
 - The Inventory of Carbon and Energy (ICE) database from Circular Ecology²⁰.
- 5.55 The level of information provided should be proportional to the application. It is sufficient for applicants for non-major developments to provide information from the BRE Green Guide. The BRE Green Guide provides ratings for different elements (components) of a building using different construction approaches (e.g. a brick and block cavity wall, a timber pitched roof with clay tiles). The BRE Green Guide element ratings are free to access after registering. The Council encourages the use of A and A+ ratings to optimise the embodied environmental impact of specification selection²¹.
- 5.56 The following information should be provided:
- description of the element (e.g. 'external wall', 'ground floor', 'flat roof'),
 - reference number for the element (a number 10 digits long)
 - rating and description of different building elements from the BRE Green Guide.
- 5.57 If the manufacturer of a material has not provided data or it is too early in the design process for the specific material manufacturers to be known, then sector level data should be used.

¹⁹ Available online at <https://www.bregroup.com/greenguide>

²⁰ Available online at <https://circularecology.com/embodied-carbon-footprint-database.html>

²¹ Available online at [FAQs - Materials Specification Credits : BRE Group](#)

- 5.58 To help describe the environmental impact of an asset, its life cycle is split into stages and modules as defined by BS EN 15978²² for buildings (and PAS 2080²³ for infrastructure). LPDMP Policy D14 (2) pertains to Modules A1-A5, or upfront carbon, which are the emissions associated with materials and construction process up to practical completion.
- 5.59 Environmental Product Declarations (EPDs) can be used to determine the environmental impact of a product over its lifecycle. Where EPDs are not available, as is often the case for structural elements, applicants are encouraged to use IStructE's guide '*How to calculate embodied carbon*'²⁴ to source default values. Table 2.3 of the IStructE guide details suggested embodied carbon factors for commonly used structural materials (based on open-source data available at the time of publication) and Section 2.2.2.2 of the IStructE guide contains a list of EPD sources that can provide detailed environmental impact information.
- 5.60 The Council encourages applicants for major applications to use the Structural Carbon Rating Scheme (SCORS), advocated by the IStructE, to clearly communicate the embodied carbon of a proposed development. SCORS is a rating system, akin to an Energy Efficiency Rating, that grades designs on a scale from A++ (green) to G (red) based on the estimated upfront carbon footprint of the proposal. For instance, across all building structures, anywhere on the planet and in any configuration, an A rating means that the estimated upfront carbon footprint of the primary superstructure plus substructure is in the range of 100–150kgCO₂ e/m² GIA²⁵.
- 5.61 Both RIBA and LETI have outlined targets for embodied carbon, and to meet IPCC targets typical designs must achieve a SCORS rating of A by the year 2030. In line with these targets the Council encourages planning applications to achieve a C rating, where this rating (or better) is achieved no further information on the embodied carbon of materials will be required. The Council will periodically review the target SCORS rating to ensure developments meet IPCC targets and remain in accordance with industry best practice.
- 5.62 It is expected that producers and suppliers of building materials will start to include carbon ratings within their brochures as embodied carbon moves up the national agenda. This information will be acceptable where it accords with a respected ratings database.
- 5.63 Where the materials with low embodied carbon have not been selected applicants should provide justification as to why this approach has been selected. For instance, the requirement to select materials with the lowest embodied carbon may be relaxed where specific materials are needed for conservation reasons.

²² British Standards Institution. *BS EN 15978:2011: Sustainability of construction works. Assessment of environmental performance of buildings*. Calculation method. London: BSI, 2011.

²³ British Standards Institution. *PAS 2080:2016. Carbon management in infrastructure*. London: BSI, 2016

²⁴ Available online at: [How to calculate embodied carbon \(Second edition\) - The Institution of Structural Engineers \(istructe.org\)](https://www.istructe.org/publications/how-to-calculate-embodied-carbon-second-edition)

²⁵ Available online at: [Setting carbon targets: an introduction to the proposed SCORS rating scheme \(istructe.org\)](https://www.istructe.org/publications/setting-carbon-targets-an-introduction-to-the-proposed-scors-rating-scheme)

Lifecycle

- 5.64 LPDMP Policy D14 (3) requires proposals for major development to demonstrate how they have considered the lifecycle of buildings and public spaces and the materials used to construct them to reduce lifetime carbon emissions.
- 5.65 Consideration of changing social and economic needs will extend the useful lives of buildings and avoid the need for extensive modification and refurbishment, or demolition and replacement. For example, new buildings for student accommodation should be able to accommodate other types of residential, and potentially non-residential, uses and be designed for deconstruction rather than demolition in order to maximise the reuse of components and reclamation of useful materials, in line with the waste hierarchy.

Aggregates

- 5.66 LPDMP Policy D2 (1a) requires developments to incorporate a proportion of recycled and/or secondary aggregates. Recycled aggregates are created by reprocessing materials that have previously been used in construction, either at the demolition site (thus saving transport costs and emissions) or in an offsite processing plant. Secondary aggregates are usually by-products of other industrial processes that have not previously been used in construction. The use of recycled and secondary aggregates reduces the quantity of primary aggregates extracted from natural deposits, reduces the amount of industrial and construction waste sent for disposal and can reduce the embodied carbon of concrete slightly²⁶.
- 5.67 Development proposals should set out estimates of the amount of aggregate likely to be used, the amount of aggregate waste likely to be generated and the proportion of building materials that will be supplied from (in order of preference):
1. the reuse of demolition waste sourced from the development site,
 2. secondary or recycled aggregates imported into the site, and
 3. primary aggregates imported into the site.
- 5.68 The estimates should be accompanied by a commentary setting out how the scheme has complied with the waste hierarchy²⁷ by prioritising sources with the lowest environmental impact in line with the list above.

Other materials

- 5.69 As with aggregates, proposals should include estimates of other types of waste materials that will arise on site and set out how these will be reused on site as a substitute for new materials wherever possible.
- 5.70 Materials from a sustainable, renewable or recycled source can limit the impact of the development on the environment: for example, timber from sustainable forests can be

²⁶ Academic research indicates that the embodied carbon of concrete can be reduced through the use of recycled aggregates, but that the reduction is often limited unless the substitute replaces cement (cement production accounts for a significant proportion of the embodied carbon in concrete).

²⁷ See page 108 of the LPSS.

certified by an organisation such as the Forest Stewardship Council (FSC) or the Programme for the Endorsement of Forest Certification (PEFC).

- 5.71 Consideration should be given as to whether sustainably sourced renewable materials can replace other building materials, taking into account the benefits of sequestering carbon within buildings. Recent years have seen growth in the use of mass timber (structural timber) as a replacement for steel and concrete. Composite materials can replace primary minerals e.g. in roof tiles. Manufacturers frequently provide environmental information for their products.
- 5.72 Using locally sourced materials will reduce the impact on the environment by lowering the embodied carbon from transport. Materials can be chosen that use fewer resources, have longer lifespans or produce less waste when they are manufactured.
- 5.73 Construction materials can reflect, absorb and release heat differently and will influence the energy characteristics of the building. The direct carbon emissions released throughout the life of the building as a result of energy use needs to be considered alongside embodied carbon when choosing the most sustainable materials.
- 5.74 Environmentally sensitive and sustainable materials can also be employed inside a building. Paints and glues can include Volatile Organic Compounds and oils that can be harmful during use or disposal. Water based paint is less environmentally harmful and better for health than oil-based paint.
- 5.75 Proposals should set out how materials have been chosen and sourced in order to reduce the impact on the environment.

Waste

- 5.76 Around a third of the UK's waste comes from construction and demolition. The waste created during construction and at the end of a building's life can be minimised through good design and site waste management planning.
- 5.77 Construction waste can be eliminated through measures such as:
- sizing rooms so that they reflect the standard sizes of construction materials to avoid off-cuts,
 - collecting off cuts and reusing them on other parts of the site,
 - careful handling of materials to avoid damage,
 - just-in-time deliveries of materials that help minimise the length of time that materials are vulnerable to damage on the building site,
 - using suppliers that accept returns of unused materials and packaging, and
 - accurate estimates of the required quantities of materials to avoid over-ordering.
- 5.78 When designing schemes and selecting materials, developers should consider designing for deconstruction rather than demolition, in line with LPDMP Policy D14 (3). From the outset, new buildings should be designed with the prospect of future deconstruction in order to

facilitate the segregation and extraction of materials during redevelopment for reuse or recycling at the end of the building's life.

- 5.79 LPDMP Policy D14 (5) requires proposals for major development, and development proposals that involve the demolition of at least one building and/or engineering works that involve the importation or excavation of hard core, soils, sand and other materials to submit a Site Waste Management Plan (SWMP).
- 5.80 A SWMP should be drafted at an early stage in order to influence the concept and design, and it should be reviewed and updated throughout the planning and construction process. An initial SWMP should be provided alongside a planning application to set out the waste strategy for the proposed development, the decision maker may request a detailed SWMP is provided at a later stage such as through planning conditions.
- 5.81 Decision makers will consider a SWMP adequate where it complies with the DEFRA Non-statutory guidance for site waste management plans (2008) which is available on the Council's website here:
<https://www.guildford.gov.uk/article/24211/Climate-Change-Sustainable-Design-Construction-and-Energy-SPD>
- 5.82 A SWMP should be in place before construction or demolition works begin and then treated as a live document that is used to monitor waste and to set out a strategy for managing waste in the most sustainable way, in accordance with current construction practice and the waste hierarchy.

Demolition

- 5.83 The NPPF treats buildings as a resource, and paragraph 157 directly encourages their reuse. Paragraph 164 of the NPPF gives significant weight to the need to support energy efficiency and low carbon heating improvements to existing buildings. Unnecessary demolition and replacement of a building creates a sustainability disbenefit that results from avoidable waste, carbon emissions emitted through demolition and construction, and the embodied carbon in the new materials and waste.
- 5.84 There are situations where demolition may be acceptable. Demolition and redevelopment can create a net increase in housing by increasing the number of dwellings on a site. This allows the developed land to be used more efficiently, taking pressure off undeveloped land, and creates a social sustainability benefit by providing new homes. These benefits can weigh against the environmental harm of demolition and construction. Furthermore, if a building is structurally unsound then demolition and replacement may be the only way to bring the previously developed site back into use.
- 5.85 If a building is structurally sound, then renovation should be explored to the greatest extent. Renovating includes, but is not limited to, extending, converting, refurbishing, and retrofitting. This approach may also allow a building to achieve the same level of building

performance and energy efficiency as a replacement dwelling but with a lower waste and embodied carbon impact.

- 5.86 There may be certain situations where renovations would not be practical and demolition is the only reasonable option for a site. Where such circumstances occur applicants should clearly set this out in the planning application.
- 5.87 A full Lifecycle Carbon Analysis (LCA) is the best way to quantify the carbon impact of a development over time and show how long it will take to payback the carbon emissions associated with demolition and construction. LCAs can also be used to demonstrate how a renovation would compare against demolition and replacement.
- 5.88 If demolition and replacement is considered to be the only feasible option for a site then the negative carbon impact of a demolition and rebuild can be balanced by providing a highly sustainable replacement building. A highly sustainable building is one that provides a significant sustainability improvement over the existing dwelling.
- 5.89 A highly sustainable dwelling should have low operational carbon emissions achieved by significantly improving upon the minimum requirements of Building Regulations Part L, thereby meeting the objective of LPDMP Policy D16 (5), and by following a fabric first approach in line with the energy hierarchy, as required by LPDMP Policy D14 (1). Achieving an industry-recognised accreditation, such as Passivhaus, can demonstrate that a replacement dwelling will be highly sustainable.
- 5.90 The replacement building should directly address the embodied carbon impact of demolition through designs that deliver low embodied carbon emissions in line with LPDMP Policy D14 (2). Using renewable materials such as timber that sequester carbon can be considered to mitigate the carbon impact. Minimising and reusing waste in line with the waste hierarchy, in accordance with LPDMP Policy D2 (2), can also mitigate the carbon impact. The best possible outcome for a demolition and replacement dwelling would be for all waste to be reused and/or recycled, and for new materials to sequester large amounts of carbon in the body of the building.
- 5.91 Cumulatively, with a highly sustainable building; the low operational carbon emissions can eventually 'pay back' the disbenefits of demolition and construction. Additionally, low carbon materials and the application of the waste hierarchy can reduce the payback time and mitigate the carbon impact.

Change of use developments

- 5.92 There are likely to be opportunities for significant improvements to buildings that are converted from one use to another (e.g. from commercial to residential). Many such projects do not require planning permission from the Council. However, the Council strongly encourages change of use developments to fully explore opportunities to deliver energy efficient and sustainable buildings.

- 5.93 Where change of use requires a planning application, proposals will be required to comply with the policy and guidance set out in the Local Plan and this document.

Heritage buildings

- 5.94 The historic environment should play its part in mitigating and adapting to climate change. However, it is vital that proposed changes are consistent with the aims of heritage protection and the statutory duty of care placed on the Local Planning Authority to safeguard architectural and historical significance.
- 5.95 Good maintenance and repair are often the first advisory steps in improving a property's climate resilience and environmental performance. However, change and adaptation can also be possible where it is carried out in a manner sympathetic to the property's authenticity, character and setting. It is important to recognise that buildings of traditional construction perform very differently to buildings of modern construction as they need to breathe, and changes to their fabric performance, heating and ventilation, if not correctly undertaken can lead to unnecessary damage and maintenance problems caused by trapped moisture. Therefore, it is important when considering any work to understand how that building was designed to function.
- 5.96 There is considerable technical advice on improving the energy efficiency of historic buildings provided by Historic England: <https://historicengland.org.uk/advice/technical-advice/energy-efficiency-and-historic-buildings/>
- 5.97 Planning permission and/or listed building consent may be required for certain works and advice should be sought where in doubt. The Council will work proactively with applicants to find solutions that deliver improvements while respecting the heritage value of historic assets.

Off-site prefabrication and modular construction

- 5.98 Offsite prefabrication of whole buildings or parts of buildings, often referred to as modular construction, is becoming more common. The products on offer typically have very high energy efficiency standards and some (but not all) are built to very high standards for quality of internal environment and the use of sustainable materials. The controlled manufacturing process can result in low levels of waste. The Council recognises the benefits of low-waste, high energy efficiency modular construction methods and will take this into account when assessing proposals. Where a significant proportion of a scheme's construction employs offsite prefabrication or modular construction methods, decision makers are likely to be able to conclude that the scheme has reduced construction waste substantially (but not necessarily demolition waste) in line with Local Plan policy.

Climate change adaptation

Climate change adaptation content summary

- Details of the design measures and methods that will mitigate the risk of overheating.
- A CIBSE TM52/TM59 assessment showing no unacceptable risk of overheating for major development in the Urban Areas.
- Details of the design measures and practices used in new buildings to address the specific vulnerabilities of vulnerable people.
- Details demonstrating the application of the cooling hierarchy.
- Details of measures that prevent the ignition and spread of fire in and around areas of high risk of wildfires.
- Measures used to manage flood risk in response to more frequent and severe rainfall events.
- Details of Sustainable Drainage Systems (SuDS) to manage surface water for all major development and all developments in areas of flood risk.

- 5.99 LPSS Policy D2 (4) states all developments should be fit for purpose and remain so into the future. Buildings must incorporate adaptations, and be adaptable, for a changing climate and changing weather patterns in order to avoid increased vulnerability and to offer high levels of resilience to the full range of expected climate change impacts.²⁸ Development proposals should set out the climate change adaptation measures that have been employed and demonstrate that they are appropriate and adequate to meet the challenge of climate change.
- 5.100 To remain fit for purpose buildings built today will need to become zero carbon in the future. Buildings should be designed to enable, and not impede, future retrofit measures that improve energy efficiency or allow the use of zero carbon energy. For instance providing hot water or heat storage (e.g. a hot water cylinder or heat battery) and space for piping will enable buildings to accommodate heat pumps. Any proposed building that would require modifications to the layout in order to remain fit for purpose will not be considered future proofed for climate change.

²⁸ Further detail of the expected impacts can be seen in a number of publications from respected sources such as the UK Climate Change Risk Assessment 2022. Available at: <https://www.gov.uk/government/publications/uk-climate-change-risk-assessment-2022>

Hotter, drier summers and heatwaves

- 5.101 Buildings should be designed to maximise the opportunities for natural ventilation, cooling and lighting to avoid the risk of overheating, a risk that is likely to increase over time with the increasing prevalence and severity of heatwaves and a generally warmer climate.
- 5.102 Water stocks are already under pressure and with the increased prevalence of drought the situation is likely to worsen. Developments that require large amounts of water, like golf courses, should set out how they will avoid drawing on public or environmental water stocks e.g. by collecting and storing water from rainfall.

Overheating

- 5.103 LPDMP Policy D15 (1a) requires development proposals to demonstrate how new buildings will be designed and constructed to provide for the comfort, health, and wellbeing of current and future occupiers over the lifetime of the development, covering the full range of expected climate impacts and with particular regard to overheating.
- 5.104 Overheating is already a problem in the UK, and it is likely to worsen. Overheating occurs when buildings are heated, whether by sunlight or mechanical heating and the heat is either prevented from escaping or cannot dissipate due to a high outside temperature.
- 5.105 Chartered Institution of Building Services Engineers (CIBSE) CIBSE has produced the TM52 Thermal Comfort Analysis which provides a tool for determining at the detailed design stage whether a proposed building will be susceptible to overheating. TM59 “Design methodology for the assessment of overheating risk in homes” specifically assesses overheating in homes (TM52 can be applied to any type of building). The TM59 assessment provides a standardised methodology to assess the complex way dwellings respond to external temperatures and can be used to demonstrate compliance with Building Regulations Approved Document O (2021).
- 5.106 Building Regulations Part O: Overheating (2021) took effect in June 2022 and aims to protect the health and welfare of occupants of dwellings by reducing the occurrence of high indoor temperatures. The regulations apply to new residential buildings only. Applications for new residential buildings must demonstrate compliance with Part O through either the Simplified Method or Dynamic Thermal Modelling route (TM52 or TM59 assessment).²⁹

The cooling hierarchy and passive heat control

- 5.107 Mechanical cooling equipment (e.g. air conditioning) is often installed to mitigate excessive heat. Mechanical cooling increases energy consumption and requires maintenance, resulting in costs and carbon emissions. LPDMP Policy D15 (1b) requires development proposals to demonstrate how new buildings will incorporate passive heat control measures, in line with the cooling hierarchy. The cooling hierarchy is set out below:

²⁹ More information about Building Regulations Part O: Overheating is available at: [Approved Document O: Overheating \(publishing.service.gov.uk\)](https://www.gov.uk/guidance/approved-document-o-overheating)

1. Passive design to eliminate or minimise unwanted heat gain and to manage heat through; orientation, shading, fenestration (through the use of design features such as external shuttering and brise soleil), soft landscaping (through the retention of trees and planting of vegetation), thermal mass and energy efficient lighting and appliances.
2. Passive/natural cooling (e.g. cross/passive stack ventilation, night purging) that removes unwanted heat.
3. Mechanical ventilation that removes unwanted heat.
4. Active cooling systems (e.g. air conditioning) that cool the internal air.

5.108 Measures at each step of the cooling hierarchy should be maximised before moving on to the next step. Applications should clearly set how the cooling hierarchy has been applied, detailing of the measures that have been utilised and why these were the most appropriate for the development.

Vulnerable people

5.109 For vulnerable people, regard will be had to the World Health Organisation guidance on thermal comfort for temperate zones which states that temperatures above 24°C cause discomfort generally and can cause harm to the more vulnerable members of the population including the elderly, infants and children, and pregnant women. LPDMP Policy D15 (2) requires new buildings likely to accommodate vulnerable people to demonstrate that their specific vulnerabilities have been taken into account, with a focus on overheating.

Urban heat island

5.110 The urban heat island effect refers to the situation where urban areas are substantially warmer than the rural areas surrounding them; up to five degrees warmer in urban areas such as Guildford and Ash and Tongham. It occurs due to the form of the urban environment and the use of hard, impervious, and generally dark surfaces that absorb large amounts of solar energy and trap heat.

5.111 Introducing natural green and blue features can both reduce heat build-up and allow ambient heat to escape, and trees can provide shading that cools surfaces and reduces ambient air temperature through evaporation of water via the leaves.

5.112 LPDMP Policy D15 (3) requires proposals for major development within the urban areas shown on the Policies Map to demonstrate how the urban heat island effect will be addressed through:

- a) choice of materials;
- b) layout, landform, massing, orientation and landscaping; and
- c) retention and incorporation of green and blue infrastructure as far as possible.

5.113 The Ash and Tongham and Guildford Urban Areas are prone to the Urban Heat Island effect where overheating is likely to be more acute. All applications for development in urban

areas, as identified on the Local Plan policies map, should clearly set out how the risk of overheating has been addressed. Applications for major developments in urban areas should submit a report that demonstrates the development passes CIBSE's TM52/TM59 assessment of overheating.

Areas of high risk of wildfire

- 5.114 Hotter, drier summers are predicted to significantly increase the risk and severity of wildfires. Heathland in Surrey is prone to wildfire and dry grassland can also be susceptible, significant wildfires have occurred in Guildford borough.
- 5.115 LPDMP Policy D15 (5) requires development proposals in and around areas of high risk of wildfires to be designed and managed to prevent the ignition and spread of fire. The areas at high risk of wildfire are:
- the Thames Basin Heaths Special Protection Area (SPA),
 - heathland outside the SPA boundary,
 - areas of dry grassland, and
 - the immediate environs of the above.

Wetter winters and heavy rainfall events

- 5.116 Winters will become wetter and extreme rainfall events will become more frequent and more severe. As a result, the management of surface water will become more important.
- 5.117 LPDMP Policy D15 (4) requires development proposals to demonstrate adaption for more frequent and severe rainfall events through measures including:
- a) retaining existing and incorporating new water bodies;
 - b) designing planting and landscaping schemes to absorb and slow down surface water; and,
 - c) the use of permeable ground surfaces wherever possible.
- 5.118 LPDMP Policy P11 sets out requirements for the use of natural flood management and SuDS which reduce the risk of flooding and mitigate the impact of drier summers.
- 5.119 The use of natural or permeable surfaces should be maximised including, where appropriate, green roofs and walls. Where new hard surfaces are proposed they will normally need to be of permeable materials and retained for the life of the development, secured by a planning condition. This is particularly important on sloping land where impermeable surfaces can exacerbate river or surface water flooding downslope.
- 5.120 National policy covers flooding and flood risk and the National Planning Practice Guidance provides guidance on how national policy should be applied. LPSS Policy P4 also covers flooding and flood risk. Under national policy, some developments are required to produce a Flood Risk Assessment. When doing so, they must make an allowance for climate change, in accordance with Environment Agency guidance:

<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

Sustainable Drainage Systems (SuDS)

- 5.121 The NPPF requires all major development and all other developments in areas of flood risk to utilise SuDS, unless there is clear evidence that SuDS would be inappropriate.³⁰
- 5.122 SuDS should be the primary source of surface water management under LPSS Policy P4 (5), and they should be considered from the earliest stage of site design and follow the SuDS hierarchy under LPDMP P11 (7a). Where SuDS are not proposed as the primary source of surface water management, a clear reasoning setting out why it would not be appropriate or effective should be provided.
- 5.123 SuDS offer multiple benefits, they can help to manage flood risk, improve water quality, provide opportunities for water efficiency, enhance landscape and visual quality, provide amenity value, and deliver gains for biodiversity. The design of SuDS should explore fully the potential to deliver these benefits.
- 5.124 It is the responsibility of a developer to make proper provision for surface water drainage to ground, water courses or a surface water sewer as drainage of surface water to the foul sewer is a major contributor to sewer flooding. The connection of surface waters to the public sewer will not be permitted without confirmation from the Lead Local Flood Authority (LLFA) (SCC) that the sequential approach to the disposal of surface water has been followed and all practical alternatives have been explored.
- 5.125 Applicants are advised to design SuDS in accordance with the best practice approach set out in the CIRIA SuDS Manual (C753) (<https://www.ciria.org/ItemDetail?iProductCode=C753&>), or updated published guidance that replaces or supplements this.
- 5.126 More information on SuDS can be obtained from Susdrain. Susdrain is a community that provides a range of resources for those involved in delivering sustainable drainage systems: <https://www.susdrain.org/>
- 5.127 Local guidance is available from the LLFA. The LLFA is consulted on proposals for SuDS within major developments as part of the planning process.
<https://www.surreycc.gov.uk/community/emergency-planning-and-community-safety/flooding/more-about-flooding/suds-drainage>

³⁰ NPPF paragraphs 173 and 174, available at:

https://assets.publishing.service.gov.uk/media/65a11af7e8f5ec000f1f8c46/NPPF_December_2023.pdf

6. Renewable and Low Carbon Energy Generation and Storage

Renewable and Low Carbon Energy Generation and Storage information checklist

- Environmental benefits
- Economic benefits
- Community benefits
- Other benefits / considerations

- 6.1 LPDMP Policy D17 sets out the Council's approach towards renewable and low carbon energy generation and storage, and what information must be provided when applying for this type of development.
- 6.2 In recent years the importance of renewable generation has grown considerably as the UK aims to meet the legal requirement to reduce greenhouse gas emissions by at least 100% of 1990 levels by 2050, as set by the Climate Change Act 2008³¹. This increased importance has been reflected in many of the decisions made by the Planning Inspectorate where the weight attributed to the generation of renewable energy in the planning balance is now described as very substantial, significant or exceptional.
- 6.3 The Council declared a Climate Emergency in July 2019 and passed a motion committing to action including achieving net zero carbon across all Council services by 2030³². The Council is supportive of proposals for renewable and low carbon energy generation and storage, and such proposals will help achieve the Council's ambition for the borough to be net zero carbon. LPDMP Policy D17 provides policy to ensure that proposals for renewable and low carbon energy generation and storage provide holistic benefits while minimising visual impacts and maximising opportunities for biodiversity.
- 6.4 Furthermore, applications for renewable energy are usually of a temporary nature so the policy safeguards the land by requiring proposals to show how a site will be decommissioned and restored to its original state.

Green Belt

- 6.5 This section provides guidance on LPDMP Policy D17 (2) and paragraphs 5.249-5.250 of the LPDMP, to provide further clarity on what may be taken into account when considering whether very special circumstances can be demonstrated.

³¹ Climate Change Act 2008 (amended 2019). Available at: <https://www.legislation.gov.uk/ukpga/2008/27/contents>

³² Further information is available in the Guildford Borough Council Climate Change Action Plan. Available at: <https://democracy.guildford.gov.uk/documents/s28673/Item%205%201%20-%20Climate%20Change%20Action%20Plan%20v1.8.pdf>

Environmental benefits

- 6.6 Sub-section 1 of paragraph 5.250 of the LPDMP outlines three environmental benefits that will be considered when weighing up the potential benefits of a renewable energy generation or storage project. These are:
- a. the contribution that will be made to national and local targets for low carbon energy generation and carbon emissions reductions including through the reinvestment of income into other low carbon projects;
 - b. the wider contribution to the public good through climate change mitigation; and
 - c. improvements to biodiversity in line with the policies in this plan.
- 6.7 Applicants are expected to set out how a proposal will contribute to local and national targets. There are several local targets which include the Council's ambition for its services to become net zero carbon by 2030 and Surrey's Climate Change Strategy which identifies Surrey as an area with great potential for solar energy. These are alongside national targets in the Climate Change Act 2008 and objectives outlined in documents such as the Energy White Paper - Powering our Net Zero Future of December 2020 and the Net Zero Strategy: Build Back Greener 2021.
- 6.8 Proposals for renewable energy generation and storage are often on land with low biodiversity value. Therefore, such proposals offer significant opportunities for biodiversity net gain and can contribute to achieving the objectives set by Biodiversity Opportunity Areas. Applicants should clearly set out how proposals will provide biodiversity benefits and how these are in accordance with the biodiversity policies in the development plan.
- 6.9 Alongside benefits to biodiversity, renewable energy generation and storage schemes can improve the quality of soil and water. The majority of applications for this type of development are on agricultural land and so removing the land from agricultural use reduces the quantity of fertilisers and pesticides applied to the land, and allows carbon sequestration to occur. Applicants should clearly show whether proposals will provide benefits to the soil and/or quality and productivity of the land and support this with quantitative evidence where practical.

Economic benefits

- 6.10 Sub-section 2 of paragraph 5.250 of the LPDMP outlines two economic benefits that will be considered when weighing up the potential benefits of a renewable energy generation or storage project. These are:
- d. benefits to the local economy through job creation and investment; and
 - e. improvements to the sustainability of the rural economy through diversification of agricultural land and by creating alternative income streams for farmers and other landowners.

- 6.11 Applicants should clearly set out any direct benefits to the local economy, for instance using local companies to undertake the work or how income from renewable energy schemes could cross-fund other activities that would benefit the local economy.

Community benefits

- 6.12 Sub-section 3 of paragraph 5.250 of the LPDMP outlines five community benefits that will be considered when weighing up the potential benefits of a renewable energy generation or storage project. These are:
- f. community ownership or part ownership of the scheme and/or reinvestment of profits into community funds;
 - g. reduction in fuel poverty and increased energy security for local people;
 - h. the decarbonisation of local homes, particularly where the homes currently use high carbon sources of energy such as stored oil;
 - i. helping to deliver policies and outcomes identified in neighbourhood plans; and
 - j. contributing to the continuing use of community buildings.

- 6.13 Consideration can be given to both the wider societal benefits provided by renewable energy and storage development and local benefits such as increased energy security. Applicants should engage with the local community from the outset and clearly state any benefits the local community will receive from proposals.

Other considerations

- 6.14 In addition to meeting the requirements of the development plan as a whole, other factors particularly pertinent to renewable and low carbon energy generation and storage projects will be considered by decision makers including, but not limited to, the temporary nature, visual impact and exploration of alternative sites.
- 6.15 Sub-section 4 of paragraph 5.250 of the LPDMP notes that the temporary nature of many proposals for renewable energy generation and storage are not considered to be a benefit but do help to minimise much of the harm attributed to a proposal. The temporary nature means that elements, such as the openness and purposes of the Green Belt, are not permanently impacted as the land returns to its former use after decommissioning. Where applications are for a temporary permission, applicants should set out how a proposal will not result in long term harm to the site and surrounding area and how the land will be restored to its former state, or better.
- 6.16 LPDMP Policy D17 (3) requires applicants to minimise the visual impacts of a development. It is vital to differentiate between different views in an area, such as immediate views and wider vistas, and the relative importance of these. This is alongside considering how someone will experience these views and vistas, for instance a brief glimpse by someone driving compared to an extended look by a pedestrian. The relative merit and value of these

different ways of viewing a site should be considered by applicants when minimising the visual impact of a proposal. Schemes should set out the choices and measures taken to limit the impacts across different scales.

- 6.17 If alternative sites have been considered as part of the development and design process applicants should set out why these were not suitable, and why the proposal was the preferred option. An alternative sites assessment should be holistic and extensive. It should analyse the various benefits and harms of different locations including, but not limited to, the technical constraints such as connections to the electricity network and access to the site, and the status of the land such as whether it is classified as 'Best and most versatile agricultural land' (BMV).³³ While an assessment of alternative sites will not be considered a benefit, a decision maker can apply weight to the fact the selected site appears to be the most suitable one for the proposed development when considering the various constraints.

³³ Annex 2: Glossary of the NPPF defines Best and most versatile agricultural land (BMV) as land in grades 1, 2 and 3a of the Agricultural Land Classification. The NPPF is available at:
https://assets.publishing.service.gov.uk/media/65a11af7e8f5ec000f1f8c46/NPPF_December_2023.pdf

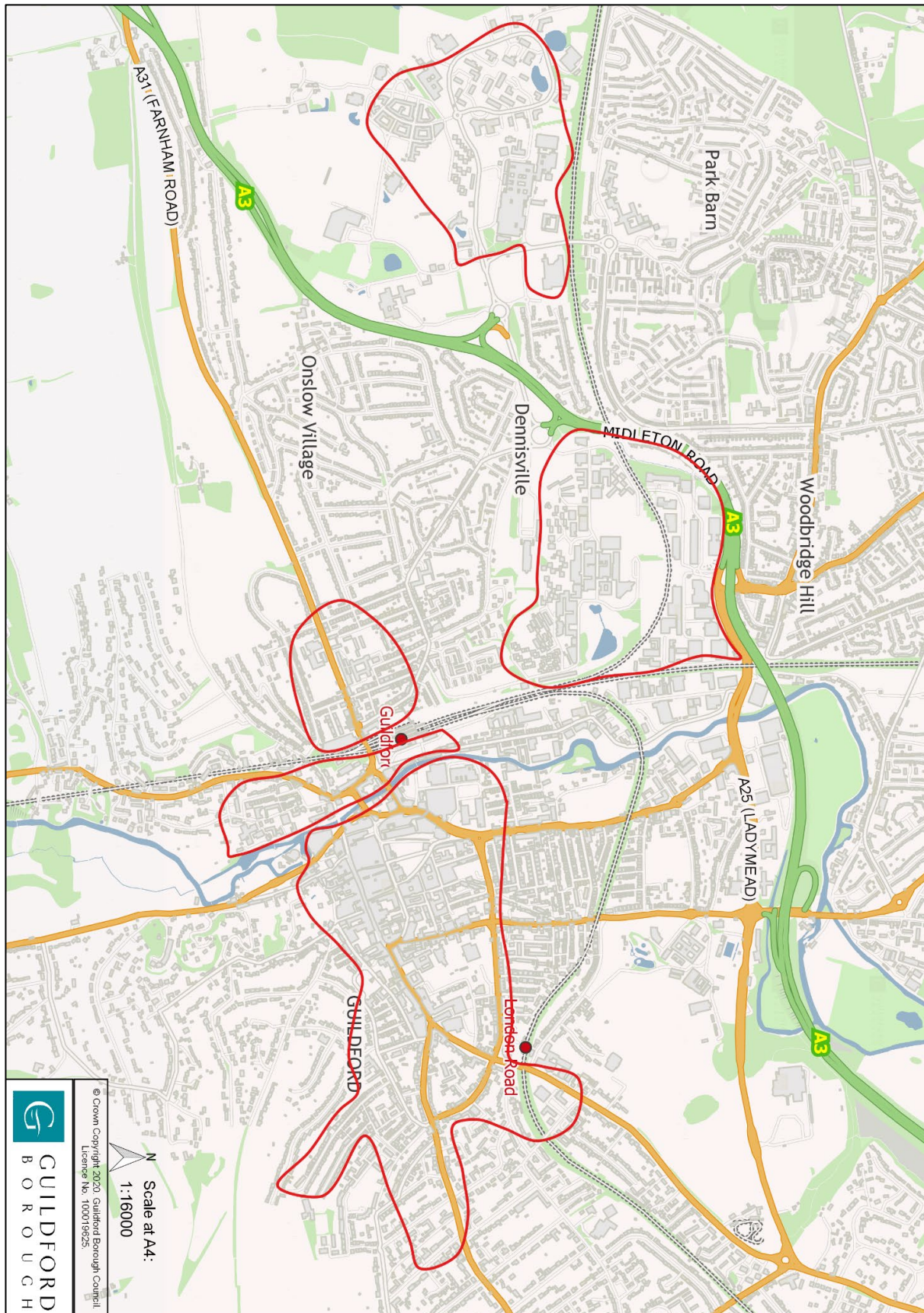
7. Glossary

BER	Building Emission Rate - the CO ₂ emission rate of a non-residential building based on its design specification. The BER is a metric used to assess compliance with the Building Regulations.
CCHP	Combined Cooling Heating and Power: A power plant that generates electricity and useful heating and cooling simultaneously for distribution through a network providing power and heat to buildings. The lack of energy lost means the system is highly efficient. CCHP plants and distribution networks can work at a number of scales and can be powered by fossil fuels, like oil and gas, or renewable fuels, like wood pellets. CCHP is often referred to as trigeneration and CCHP networks that serve multiple buildings may be referred to as district heating and cooling networks.
CHP	Combined Heating and Power - A power plant that generates electricity and useful heat simultaneously for distribution through a network providing power and heat to buildings. The lack of energy lost as heat results in high efficiency. CHP plants and distribution networks can work at a number of scales and can be powered by carbon-based fuels, like oil and gas, or renewable fuels, like wood pellets. CHP is often referred to as cogeneration and CHP networks that serve multiple buildings may be referred to as district heating networks.
Climate Change Adaptation	Adaptations to buildings, places or environments that make them more resilient to, and potentially benefit from, expected changes in climate and weather patterns.
Climate Change Mitigation	Action to reduce the impact of human activity on the climate system, mainly through reducing greenhouse gas emissions.
DER	Dwelling Emission Rate - the CO ₂ emission rate of a dwelling based on its design specification. The DER is a metric used to assess compliance with the Building Regulations.
DFEE	Dwelling Fabric Efficiency Rate is a measure of the space heating and cooling requirements per square metre of floor area based on its design specification. The DFEE is a metric used to assess compliance with the Building Regulations.
Direct carbon emissions	The direct or operational carbon emissions are emissions that result from the use of a building (e.g. space and water heating, lighting, mechanical ventilation)
District heating	See heat network
Embodied carbon	The carbon footprint of a material or building that results from the embodied energy used to create it.
Embodied energy	The energy consumed by all of the processes associated with the production of a material or building including mining and processing of natural resources, manufacturing, transport and product delivery.
EV	Electric vehicle - a vehicle powered by electricity.
FSC	Forest Stewardship Council - a body that promotes responsible management of the world's forests. It provides sustainability certification for timber products by setting specific standards that timber supplier must meet.
Heat Distribution Network	See heat network

Heat Network	A system of insulated pipes which transports heat from a source (or multiple sources) to more than one end user.
Heat Priority Areas	Heat Priority Areas are the locations which are likely to have the most potential for viable district heating networks. These were established through the Guildford Renewable Energy Mapping Study which assessed a set of criteria such as residential heat load and heat density.
Heat Pump	A heating system that absorbs heat from the air, ground or water and uses it to heat a building. Some heat pumps can also cool buildings by transporting heat outside.
MMC	Modern Methods of Construction - methods of construction that are typically quicker, cheaper and more sustainable than traditional construction methods. MMC include offsite prefabrication, modular construction, precast panels and insulated concrete forms.
Offsite construction	The construction of buildings or building elements away from a development site.
Modular construction/modular buildings	Modular buildings are assembled on site from components manufactured in factories.
Operational carbon emissions	See direct carbon emissions
PEFC	Programme for the Endorsement of Forest Certification - an umbrella brand incorporating national timber certification schemes (see FSC).
Sun tunnel/sun tube	A pipe or tube that transports sunlight from the exterior to the interior of a building, reducing the need for electric lighting in areas where windows would not provide enough natural light.
TER	Target Emission Rate - the target CO ₂ emission rate for a new building set by the Building Regulations. The TER differs depending on the detail of the building.
TFEE	Target Fabric Energy Efficiency Rate is a measure of the space heating and cooling requirements per square metre of floor area calculated from a Notional Dwelling constructed set by Building Regulations.

8. Appendices

Appendix 1 - Map of Heat Priority Areas



Appendix 2 - Climate Change, Energy and Sustainable Development Questionnaire

When should this questionnaire be used?

This questionnaire is for non-major developments (developments from one to nine residential units and one to 1000 square meters of non-residential floor space) and householder developments.

Developments of a scale above these thresholds (major developments) should not use the questionnaire, but should instead submit a Sustainability Statement and an Energy Statement. See LPSS policy 'D2: Climate change, sustainable design construction and energy' (policy D2) and the 'Climate Change, Sustainable Design, Construction and Energy SPD' (the 'SPD') for more information.

What is the purpose of this questionnaire?

LPSS Policy D2 (3) requires non-major developments to submit "adequate information" about how the development complies with the energy requirements of the development plan and "information proportionate to the size of the development" regarding other matters of sustainability.

The questions in the questionnaire are based on requirements set out in Local Plan policies and you should refer to these to make full use of the questionnaire. The Climate Change, Sustainable Design, Construction and Energy SPD sets out guidance on the matters covered within the questionnaire.

The questionnaire is not an exhaustive list of sustainability matters and additions to the questionnaire are welcome.

The questionnaire is intended to guide development towards sustainable outcomes through compliance with Local Plan policy, from the initial proposal and site layout through to detailed design proposals, the construction process and finally the operation of the completed building. As a result, it is important that the questionnaire is first considered at the outset of planning and at the earliest stage of design. It should be updated as proposals evolve.

If planning permission is granted, a condition will be applied requiring work to be carried out in accordance with the information provided in the questionnaire. It is important that the questionnaire is completed in good faith and any works identified within it are deliverable.

Other notes

If extra space is needed, attach additional pages to the questionnaire as necessary or paste the questions into a new document. A Word version of the questionnaire is available on the Council's website here:

<https://www.guildford.gov.uk/climatechangespd>

Applicant's name:	
Agent's name:	
Site Address:	
Application reference (if known):	
Description of proposal: (e.g. total and types of units/floorspace)	
Questionnaire prepared by: (name and qualification/job title)	
Signature of above:	
Energy information prepared by: (name and qualification/job title):	
Signature of above:	

Part 1: Energy

1. Accreditation

1a. Will any accreditations (e.g. BREEAM "Excellent" or "Outstanding" or Passivhaus) be achieved? (see 3.10-3.13 of the SPD)

2. Low energy design: landform, layout, building orientation, massing and landscaping (LPSS Policy D2 1c and 2). See 'sustainable design' in section 5 of the SPD.

2a. Provide details on how the site layout, landscaping and urban form have been considered to reduce the need for mechanical heating and artificial lighting in the development? *This information should align with the energy data provided in section 3 of this questionnaire (see 5.6-5.10 of the SPD).*

2b. Set out how the internal layout of buildings have been designed to make best use of solar gain and natural light? (see 5.11-5.15 of the SPD)

2c. Provide information on the passive cooling/ventilation measures be incorporated into the scheme? *This includes but is not limited to the use of design measures such as external shuttering and brise soleil, and the use of soft landscaping such as tree retention and the planting of vegetation (see 5.107-5.108 of the SPD)*

2d. Will the scheme include mechanical cooling (e.g. air conditioning)? If so, explain why passive measures would not be adequate. *(see 5.107-5.108 of the SPD)*

3. Carbon emissions from buildings (LPSS Policy D2 2, LPDMP Policy D14 1 and LPDMP Policy D16 4)

3a. Will the proposed scheme deliver any new buildings (net or gross)? *If 'no', go to section 5.*

3b. What are the DER/BER and the TER for each unit or type of unit? *(see 4.31-4.41 of the SPD)*

3c. For all developments, provide information about how the energy hierarchy and fabric first approaches have been applied. Set out how the proposed fabric standards represent the best reasonably achievable standards for the scheme. See the section 'Energy hierarchy' for further information. *(Note: This information is not required for any new dwellings where the energy modelling output document demonstrates that the DFEE is at least 10% lower than the TFEE). (see 4.5-4.30 of the SPD)*

4. Low carbon heat networks (LPDMP Policy D16 1, 2 and 3 and LPSS Policy D2 8).

4a. Will the development fall within the vicinity of a low carbon heat network (of any scale from single building to district heat)? If so, list the identified networks. *(see 4.48-4.52 of the SPD)*

4b. If the development will fall within the vicinity of a low carbon heat network will the proposed development connect to it or be connection-ready? If not, set out clear justification. *(see 4.48-4.52 of the SPD)*

4c. Is the development within a Heat Priority Area? If so, is a low carbon heat network proposed as the primary source of energy for the development? If not, set out clear justification. *(see 4.53-4.54 of the SPD)*

4d. If a new low carbon heat network is proposed, is it designed in accordance with the CIBSE Heat Networks Code of Practice? If not, provide clear justification. *(see 4.55-4.61 of the SPD)*

5. Low and zero carbon energy

5a. If the scheme includes the provision of low and zero carbon technologies, provide details of the proposed energy systems here including: type of technology, location of installation and predicted energy yield. *(see 4.62-4.76 of the SPD)*

Part 2: Sustainable design, construction and climate change adaptation

6. Efficient use of minerals, use of secondary aggregates, waste minimisation and reuse of material from excavation and demolition (LPSS Policy D2 1a &1b). See 'Resources, materials and waste' in section 5 of the SPD.

Materials and waste

6a. Will the scheme employ modular construction, modern methods of construction (MMC), offsite prefabrication or other low waste construction methods? If yes, provide information here. *(see 5.98 of the SPD)*

6b. List the main materials that are expected to result from excavation works including for foundations (e.g. topsoil, earth, rock etc.).

6c. List the main materials that are expected to result from the demolition of buildings or structures (e.g. brick/block, concrete, roof tiles, timber etc.).

6d. List the main materials that are expected to result from the construction or refurbishment process (including from offcuts, breakages, excess materials, packaging).

6e. Of the materials identified in questions 5b, 5c and 5d, state which will be reused in the proposed development (whether fully or partially) and how/where. *(see 5.66-5.82 of the SPD)*

6f. Which of the following measures will be implemented? (mark each with a tick)

- Waste types will be stored on site separately to facilitate reuse, reclamation and recycling []
- Waste will be separated after removal from the construction site []
- Large packaging items (e.g. wooden pallets, one tonne bags) will be returned the supplier []
- Excess materials will be returned to the supplier []
- Other (please provide details in 6g) []

6g. Provide details of any further measures that will be used to ensure that waste materials will be recycled, reused, salvaged, composted, or otherwise diverted from landfill or incineration.

Sustainable materials

6h. Provide a sustainability rating for the main building elements/materials (or building as a whole) with reference to a respected materials rating database (e.g. BRE Green Guide) or scoring system (e.g. SCORS). *(see 5.53-5.63 of the SPD)*

6i. Provide details of materials that will be sourced locally. *(see 5.72 of the SPD)*

6j. Provide details of materials that will be sustainably sourced (e.g. FSC certified timber). *(see 5.69-5.75 of the SPD)*

6k. Please provide any further information about the use of sustainable materials.

7. Water efficiency (LPSS Policy D2 1d and LPDMP Policy D14 6). See 'Water efficiency' in section 5 of the SPD.

7a. If the scheme includes new dwellings, will these be designed to the national optional building regulation water efficiency standard of 110 litres per person per day (regulation 36(2b))? The relevant Water Efficiency Calculation (s) (Part G) for the new dwellings should be submitted to the Council prior to occupation. *(see 5.44-5.48 of the SPD)*

7b. For all developments, provide details of any water efficiency measures that will be incorporated into the scheme to reduce the demand for water. *(see 5.46-5.47 of the SPD)*

7c. For all developments, provide details of any water harvesting / re-use measures that will be incorporated into the scheme. *(see 5.49-5.51 of the SPD)*

8. Sustainable lifestyles (LPSS Policy D2 1e and LPDMP Policy D14 3). See 'Measures that enable sustainable lifestyles for building occupants' in section 5 of the SPD.

8a. What measures will be incorporated into the development to enable sustainable lifestyles for building occupants. *(see 5.21-5.43 of the SPD)*

8b. What measures will be incorporated into the development to ensure the building is flexible to accommodate changing needs. *(see 5.65 of the SPD)*

9. Climate change adaptation (LPSS Policy D2 4, P4 and LPDMP D15 1, 2, 4 and 5). See 'Climate change adaptation' in section 5 of the SPD.

9a. Explain the adaptations for the full range of expected climate impacts that will be incorporated into the development. *The climate impacts include, but are not limited to, hotter/drier summers, warmer/wetter winters, more frequent and severe heatwaves and overheating, and more frequent and severe heavy rainfall events and flooding. (see 5.99-5.127 of the SPD)*

9b. Provide details of how soft landscaping and permeable surfaces will be maximised (as opposed to hard surfacing). *(see 5.116-5.120 of the SPD)*

9c. Will surface water be managed by Sustainable Drainage Systems (SuDS)? Please provide details. *(see 5.121-5.127 of the SPD)*

9d. Is the development proposal in or around an area of high risk of wildfire? If so, detail how the proposal will be designed and managed to prevent the ignition and spread of fire. *(see 5.114-5.115 of the SPD)*

10. Any further information

10a. Please provide information about any other sustainable design, construction and climate change measures that will be incorporated into the scheme.